Assessing performance of Communities of Practice in Health Policy:

A conceptual framework

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ACRONYMS

BSC: balance scorecards

CoP: community of practice

DAC: Development Assistance Committee

HHA: Harmonization for Health in Africa

ICT: information and communication technologies

NGO: non-governmental organization

PBF: performance-based financing

ROI: return on investment

SUMMARY

Communities of Practice are groups of people that interact regularly to deepen their knowledge on a specific topic. Thanks to information and communication technologies, communities of practices can involve experts distributed across countries, and adopt a 'transnational' membership. This has allowed the strategy to be applied to domains of knowledge such as health policy with a global perspective. Communities of practice represent a potentially valuable tool for producing and sharing explicit knowledge, as well as tacit knowledge and implementation practices. They may also be effective in creating links among the 'knowledge holders' contributing to health policy (e.g., researchers, policy-makers, technical assistants, front-line actors, etc.).

Communities of Practice in global health are growing in number and activities. They are a central component of the knowledge strategy of Harmonization for Health in Africa (HHA), a coordination mechanism of aid agencies active in the health sector in sub-Saharan Africa. As a consequence of this expansion and within the HHA focus, there is an increasing need to document progress and evaluate effectiveness of the Communities of Practice affiliated to HHA. This report – commissioned by UNICEF WCARO - represents a first step towards such empirical research as it aims to provide a conceptual framework for the analysis and assessment of transnational communities of practice in health policy.

A scoping review of the literature, within and outside the health sector, was performed. The literature review found a large number of theoretical reflections (not always applicable to our case), but a limited number of empirically tested frameworks. This led us to develop our own framework, building both on the literature review as well as on our experience and interest in reflecting the features and challenges of communities of practice in health policy. The proposed framework organizes the key elements of communities of practice into a logical flow that links available resources and capacity to mobilize them, to knowledge management activities and expansion of knowledge, to changes in policy and practice and, ultimately, to improvement in health outcomes. Additionally, the paper addresses ways to operationalize the framework and delineates a further empirical step for the assessment of communities of practice in health policy.

As communities of practice become a more prominent strategy for knowledge management in global health, understanding and assessing their performance is increasingly important to respond to the challenge of building effective and equitable health systems through knowledge creation and translation processes.

1. INTRODUCTION

Health research plays a vital role in the improvement of health systems and the achievement of better health worldwide (Hanney & Gonzalez-Block 2011). From a system's perspective, evidence is critical to choose appropriate policy packages and to implement them. Indeed, numerous authors call for better access to research-based knowledge (The Working Group on Priority Setting 2000; Pang et al. 2003; Volmink et al. 2004) emphasizing scientific autonomy and global analyses, as well as a reduction of the gap between scientific evidence and its application (WHO 2006a; Madon et al. 2007; Remme et al. 2010). The focus of the forthcoming *World Health Report 2012* of the World Health Organization on 'research' further highlights the importance of this issue.

We recognize the critical role of research and evidence-based knowledge, as well as the need to fill the 'know-do' gap. However, we argue that current ways of achieving this will not be sufficient to lead to better health outcomes. A first issue concerns the narrow definition of knowledge that is often adopted (i.e., evidence-based knowledge acquired through research). This does not take into account the role that different types of knowledge play in knowledge translation processes (Kothari, Bickford, et al. 2011). A second issue lies in the disconnects among the 'niches' of actors of the health sector, such as policy-makers, practitioners, researchers and (in developing countries) aid agencies, each of whom is the 'holder' of a different type of knowledge (Lavis et al. 2010; Jansen et al. 2010; Meessen, Kouanda, et al. 2011).

To address these issues, proactive knowledge management (KM) strategies are needed. Platforms and opportunities should be available to allow researchers to coordinate with practitioners, and to engage with policy-makers (Landry et al. 2006; Lavis et al. 2010; Peters & Bennett 2012). Communities of Practice (CoPs) may represent a useful strategy in this sense. CoPs aim to improve knowledge management, by creating a link between niches and by building an environment where personal contact and trust allow transfer of different types of knowledge. CoPs are increasingly adopted as a knowledge management tool in global health and are receiving more attention from aid agencies and research institutions[1]. Given the exponential development of social media, a further expansion is likely in the near future. For this reason, an agenda for the rigorous documentation and assessment of CoPs needs to be developed. Establishing a framework for assessing CoPs in health policy from their earliest stages will help to make it possible to analyze the mechanisms by which they function, and to evaluate their effectiveness.

1 For example, the CoPs of the Global Health Delivery Online platform (http://ghdonline.org/), the Emerging Voices project (http://ev4gh.net/), the Communities and Discussion Forums of the Implementing Best Practices in Reproductive Health (IBP) Knowledge Gateway (www.knowledge-gateway.org), as well as the CoPs of Heath Space Asia (http://healthspace.asia/) and those launched under the "Harmonizing Health in Africa" (HHA) initiative (http://www.hha-online.org/hso/).

The documentation and assessment agenda, therefore, naturally leads to the evaluation of the CoP strategy. However, this process will need to be developed through a series of subsequent phases. Firstly, a general conceptual framework needs to be proposed. This framework must capture and logically organize the central elements and functions of CoPs in health policy and identify the determinants of CoPs' potential success. Such a conceptual framework should be flexible and adaptable to the specific documentation and evaluation needs of any one CoP. The second step is to operationalize the framework (i.e., reflect on the methodological challenges that the empirical application requires) and apply it to a real-life CoP. The conceptual framework developed should help evaluators (including facilitators of CoPs) to rigorously assess their community of focus and to investigate the determinants of its success. The evaluator's role is to adapt the framework to the specific case and tailor it to their particular needs, defining them clearly in a methodological protocol. The protocol would specify aims and objectives of the evaluation, as well as the tools and perspectives that would be adopted. Thirdly, data collection and analysis for the CoP's evaluation would be carried out. Results should be interpreted in a contextual way and used to advance the knowledge of the mechanisms by which CoPs function and the improvement of their performance.

This report focuses on the first phase by providing a general evaluation framework that can be adapted to the specific evaluation needs of CoPs. The proposed framework conceptually organizes the elements and functions of a CoP into a logical flow that highlights the specific characteristics of the CoP and the role they play in determining health outcomes. This report also presents some practical tools that can be used to operationalize the framework during the evaluation stage, including strategies for data collection and techniques for data analysis.

This work is part of a larger theoretical and empirical agenda of documenting and evaluating health policy CoPs affiliated to the "Harmonizing Health in Africa" (HHA) initiative. This initiative gathers aid agencies active in the health sector in sub-Saharan Africa.[2] It aims at providing regional support to governments in Africa in strengthening their health systems. CoPS are a central component of the HHA strategy as for knowledge management. This report addresses the assessment needs of the HHA CoPs, but the conceptual framework may also be considered a model to be adapted in the evaluation process of other such Communities.

This report is organized as follows. First, the concept of CoPs and the characteristics of transnational CoPs in health policy are described. After a section on methods, we present the findings of a scoping literature review. Based on the literature and on our experience and propositions, a conceptual framework is proposed, followed by a discussion that addresses issues regarding the 'operationalization' of the framework. Finally, an agenda for the application of the framework and further empirical research is proposed, before drawing out conclusions in the last section.

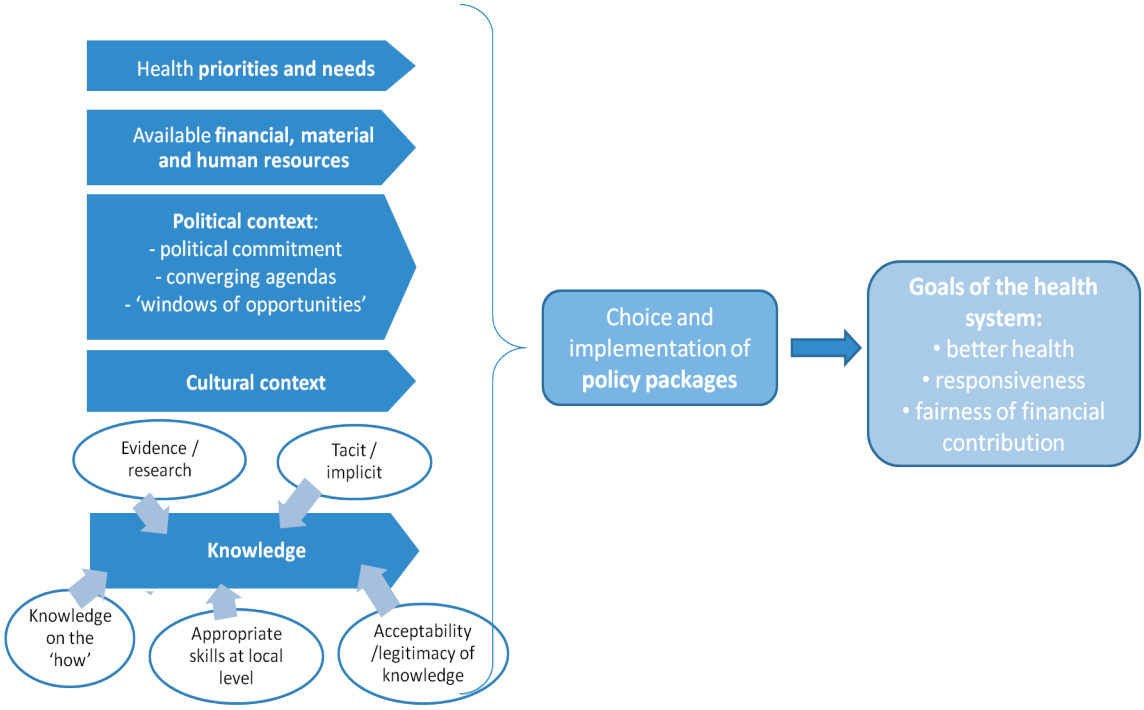
2 For HHA members and their activities see: http://www.hha-online.org/hso/

2. BACKGROUND AND CONTEXT

2.1 Getting Knowledge into Policy and Practice: challenges and complexities

Health systems are extremely multifaceted organizations. Making sure that they reach their overall goals is a complex, dynamic, non-linear process that involves different stages and numerous actors, both at national and international level (Walt & Gilson 1994). Figure 1 schematically depicts that process.

Figure 1: The process that leads to the achievement of health systems' goals.



The right side of Figure 1 represents the desired outcome: improving the health of the populations (the primary goal of a health system), as well as ensuring responsiveness and fair financing (WHO 2000). In order to achieve these goals, policy packages are designed and implemented that will lead to changes in the organization of the health system, through the reform of its components. However, the adoption of a policy package is not a simple process. Numerous factors influence the options considered, their feasibility, the choice made and its practical implementation. These factors range from local health

priorities and needs, to availability of funds, to the political context (including actors and agendas, political commitment, 'windows of opportunities' created by the merging of the problems, policies and politics streams, etc. – Kingdon 1984; Walt & Gilson 1994) and the cultural context. Available knowledge on effectiveness, cost-effectiveness, feasibility and appropriateness of potential interventions is also critical in determining which policy packages are chosen.

Although health research is undoubtedly fundamental to "generate the knowledge that can be utilized to improve health system performance and, ultimately, health and health equity" (Pang et al. 2003), our model illustrates that the term 'knowledge' should be understood in a broader way. As stated in a seminal paper by Orlikowski (2002: 249), "knowledge is not a static embedded capability or stable disposition of actors, but rather an ongoing social accomplishment, constituted and reconstituted as actors engage the world of practice". Therefore, the definition of 'knowledge' should go beyond the meaning of scientific, explicit knowledge and encompass other aspects, including knowledge on the how[3], implicit and tacit knowledge, appropriate skills and ability to use them at local level, contextual adaptation and legitimacy of the knowledge.

Several calls have been made for the reduction of the 'know-do' gap, i.e. a better understanding of the implementation processes, through, for example, initiatives such as the Implementation Research Platform of the Alliance for Health Policy and Systems Research (WHO 2006b). However, this may not be sufficient (Kothari, Bickford, et al. 2011). Indeed, to improve the knowledge production process, policy-making must tap into all 'niches' of knowledge holders (Jansen et al. 2010; Meessen, Kouanda, et al. 2011). Reaching out to these sources of information and to the different 'niches' of knowledge holders is far more complex than drawing on explicit evidence. However, these factors together can contribute to the knowledge production process which is used to choose and implement the most effective policy packages (Nabyonga Orem et al. 2012).

Towards this goal, organizations should provide the (real or virtual) structures and the regular opportunities to allow researchers, who produce explicit knowledge, to coordinate with practitioners, who hold tacit knowledge and 'know how' (Landry et al. 2006; Lavis et al. 2010). By strengthening links between different actors (policy makers, practitioners, researchers, technical assistants, etc.), bridges can be built between types and areas of knowledge to move away from the 'silo mentality' that now characterizes the different niches.

In a recent paper by Meessen and colleagues (2011), it is argued that Knowledge Management strategies, defined as "enabling individuals, teams and entire organizations to collectively and systematically capture, store, create, share and apply knowledge, to better achieve their objectives" (Young 2008), have been underutilized in the international health arena. In particular, the creation of Communities of Practice (CoPs) is proposed as a potentially useful strategy to improve knowledge management, create a link between 'niches' and build an environment where personal contact and trust allow transfer of explicit and implicit knowledge.

3 Cf. the recent stress on implementation science (for instance, Madon et al. 2007)

2.2 What are Communities of Practice?

A Community of Practice is defined as "a group of people who share a concern, set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger et al. 2002). In particular, three key dimensions define a CoP: its *domain* of interest, its *community* of participating people and its *practice* of sharing a repertoire of resources and knowledge (Wenger et al. 2002). The theory of CoP is grounded in constructivist viewpoints on learning and in particular in 'situated learning theory', which argues that learning takes place through social interactions and in settings as close as possible to those of the actual practice (Lave & Wenger 1991; Kear 2011). The main advantage of CoPs is their ability to promote an environment conducive to learning and exchange by fostering social relationships and recognizing the importance of both implicit and explicit knowledge, emphasizing interactions in a climate of mutual trust (Wenger et al. 2002). In CoPs, both peer-to-peer and expert-to-apprentice interactions can be developed, enabling different levels and types of knowledge to be shared (Johnson 2001).

CoPs have been used in the business sector since the '90s as a knowledge management tool to foster professional development, create and share knowledge and improve business results of organizations (Wenger et al. 2002). They later emerged also in other sectors, including education and only recently health (Kothari, Hovanec, et al. 2011). A growing body of literature documents the early experiences of CoPs in healthcare (Le May 2009) and two systematic reviews have been performed (Ranmuthugala et al. 2011; Li et al. 2009). The results of the reviews show that health CoPs were created initially in developed countries and refer mainly to clinical practice (Ranmuthugala et al. 2011). Less attention has been focused on CoPs whose domain is health policy and whose membership is transnational; a general conceptual framework for the evaluation of CoPs in this domain has yet to be proposed (see Avila et al. 2011, for theoretical and empirical evaluation of online discussion forums in global health).

2.3 Transnational Communities of Practice in Health Policy

In recent years, CoPs emerged also in global health as a strategy to enhance exchange and co-production of knowledge across countries. Their domains are various, but they often relate to health policy, which, accordingly to the WHO (WHO n.d.), "refers to decisions, plans, and actions that are undertaken to achieve specific health care goals within a society". Besides, their membership is often 'transnational', i.e. distributed across countries and continents.

Efforts to map the existing transnational CoPs in health policy and review evidence on them have yet to be undertaken. However, based on our experience and in particular on that of the CoP on Performance Based Financing (PBF) in Africa (Box 1), we suggest that transnational CoPs in health policy have specific characteristics.

First, they include actors not only across professional groups and academic disciplines, but also across niches (often including policy-makers at national and international level, researchers, practitioners in the field, aid agencies experts, technical assistants and consultants, NGO workers, etc.), across countries and across organizations (in contrast to most business CoPs (van Winkelen 2003). Moreover, knowledge in health policy is typically extremely context-specific, as decisions on policies and on their implementation are not only based on technical issues, but also on political and cultural considerations and depend essentially on interactions between actors and contextual factors (Walt & Gilson 1994; Peters & Bennett 2012). Finally, transnational CoPs in health policy are, by definition, widely distributed, extending across countries and often continents. For this reason, they often take the form of virtual CoPs, taking advantage of information and communication technologies (ICT), even if while maintaining some face-to-face interactions (Wenger et al. 2002; Dubé et al. 2006). Given these characteristics, transnational CoPs in health policy face specific challenges that influence their formation, operation and impact.

Box 1: An illustration of a transnational CoP in health policy: the HHA Performance-Based Financing CoP.

Domain of knowledge: Performance-based Financing (PBF) is a health care financing strategy stressing the role of incentives in public health sector in low-income countries (Meessen, Soucat, et al. 2011). This strategy is receiving increased attention from governments and donors, especially in sub-Saharan Africa. As a result, there is a strong demand for knowledge production and sharing in this domain, both at country and at regional level.

Objective of the CoP: The main aim of the PBF CoP is to build a critical mass of high-quality African experts in PBF. The best option to do so is to strengthen capacity of practitioners already involved in implementing PBF schemes and enhance the sharing of their expertise at regional level. The CoP also aims at consolidating the body of knowledge on PBF through the identification and dissemination of good practices. The role of some pioneer countries (e.g. Rwanda, Burundi) is critical in the production and promotion of approaches that proved to work. A challenge remains allowing transfer of good practices, while at the same time, securing enough attention and openness to constraints and opportunities specific to each context.

Process: The CoP was launched in Burundi in February 2010. The majority of the participants at the launching event were African experts with substantial experience in designing, implementing or assessing PBF schemes. Subsequently, an online discussion group was launched (http://groups.google.com/group/performance-based-financing). To date, the group gathers around 600 experts, active on the different knobs of the knowledge chain. They are based in different regions of the world, but predominantly in Africa, including in settings where access to internet is a challenge. The CoP has a part-time facilitator and is governed by its members, through a Steering Group. Different knowledge activities are organized by the CoP: workshops, a collective book, a working paper series, a toolkit, a blog, e-discussion, and so on. The CoP is supported by different sponsors, including aid agencies, consulting companies, international NGOs and research institutes.

Achievements: PBF is expanding rapidly in sub-Saharan Africa; while the CoP's own contribution is difficult to ascertain, it has established itself as the main platform for knowledge exchange and development.

Early lessons for the management of an IHP CoP: (i) target individuals, but also obtain political buy-in from organizations playing a key role in the implementation of the specific strategy; (ii) ensure a good balance of face-to-face events such as regional workshops (for members to get to know each other) and virtual interaction (to sustain the momentum between events and to encourage regional exchange); (iii) launch enough knowledge activities to mobilize members, keep a good rhythm and make sure events are exciting; (iv) acknowledge that knowledge holders join the CoP with different backgrounds and purposes; try to bring added value to members, through individual development and career opportunities (e.g. share information on courses and job vacancies in other countries); (v) recruit a facilitator, set up a steering group, delegate management of activities to members; (vi) seize social networking opportunities offered by ICT; (vii) pay attention to language barriers.

(Adapted from Meessen, Kouanda, et al. 2011)

3. METHODS

In order to develop the conceptual framework for evaluation of transnational CoPs in health policy, first an exploratory review of the existing literature was conducted. The approach adopted for the review was that of a 'scoping study'. The entire literature was searched as described below. Criteria for inclusion were not based on quality of the studies, but on their relevance to our research question. Moreover, relevance criteria were devised *post hoc,* once authors were more familiar with the body of literature (Arksey & O'Malley 2005).

The PubMed and Google Scholar databases were searched for seminal articles by using key words. The focus was on terms such as 'systematic reviews', 'evaluation', 'assessment', 'monitoring', 'value creation', 'framework', 'success factor', 'limitations', as referred to Communities of Practices within and outside the health sector.

We then adopted a 'snow-ball technique', which allowed us to identify further literature based on the bibliography of the papers and books retrieved from the first search. Because the existing literature is so vast and diverse (and not always applicable to the case of global health policy), the search was carried out up to the point where the authors deemed that all elements relevant for transnational CoPs in health policy were included.

The elements emerging from the literature search were then combined and enriched with the findings from another documentary review (which included grey literature, online archives and discussions of existing CoPs, in particular in the health domain), in order to create a comprehensive conceptual framework.

To corroborate the findings of the scoping review, a consultation process was also undertaken (Arksey & O'Malley 2005). A first sketch of the conceptual framework was presented and discussed at two meetings organized respectively in Antwerp, Belgium (on August, 31, 2011) and in Bamako, Mali (on November 20, 2011). These meetings gathered facilitators and members of one or more CoPs, who were called to comment and provide feedback on the draft document. Their experience and expertise provided critical inputs to refine the conceptual framework and validate it.

The empirical application of this framework will provide a further opportunity for testing, refinement and validation of the conceptual framework.

4. FINDINGS FROM THE LITERATURE REVIEW

The literature review pointed to some elements relevant for the analysis and assessment of CoPs in health policy. However, the review also highlighted two fundamental, preliminary questions: (1) why is it necessary to assess CoPs?; and (2) which methodological approach should be adopted for evaluating CoPs? We discuss these two questions in the following paragraphs, before presenting the remaining results of the literature review.

4.1 Rationale for assessing Communities of Practice

Evaluations of CoPs are necessary in order to:

- document the development of a CoP,
- assess its effectiveness as a knowledge management tool,
- identify lessons learned and factors that lead to improvements in practice and better performance,
- and ultimately, sustain the CoP strategy and its role within and beyond organizations (Wenger et al 2002).

In particular, the last objective represents a critical issue raised in the management literature. In the for-profit sector, facilitators of CoPs are interested in documenting the impact of their activities on the business results, measured as Return on Investment (ROI). A higher ROI will ensure wider recognition of the CoP within the organization and therefore the survival of the community (McDermott 2002; Wenger et al. 2002; Millen et al. 2002; Scarso et al. 2009). While not measured in terms of ROI, CoPs in the health sector and their facilitators are responsible for monitoring processes and assessing the impact of their communities. Documenting successful experiences helps to mobilize financial support and catalyze attention and public recognition. These are critical to increasing the likelihood that CoPs will influence their environment and reach their goals.

4.2 Methodological approach to CoP evaluation

In terms of methodological approach, two perspectives lie at opposite extremes of a continuum. On the one hand, CoPs could be evaluated focusing exclusively on their quantitative impact on health outcomes. For example, the systematic review by Li et al (2009) concluded that there is insufficient information to assess CoPs in a systematic way because most of the case studies reviewed adopt a qualitative approach, use subjective measures (surveys of participants) and lack sufficient quantitative data to prove the specific impact of CoPs on health outcomes (isolated from other elements of the intervention). On the other

hand, numerous scholars (Wenger et al. 2002; McDermott 2002; Hoss & Schlussel 2009; van der Meijden & Jansen 2010; K4Health Project 2011; Wenger et al. 2011) argue that a focus on processes and outputs from the perspective of the community members and what Wenger et al. (Wenger et al. 2002) call "systematic anecdotal evidence" are as important as quantitative evidence of impact.

These two approaches are obviously not mutually exclusive. We believe that a comprehensive framework should be able to capture all possible approaches, as for what deserves documentation and evaluation. It is up to the evaluator, according to his research question, to identify the appropriate research and evaluation design, as well as the information to collect.

4.3 Assessing CoPs: what does the literature suggest?

Having defined the purpose, scope and approach of CoPs assessment, we identified the relevant literature to build upon for the construction of our conceptual framework. The retained papers are presented in Table 1, which highlights both general information on the articles, as well as specific information on their key elements, findings and propositions.

With few exceptions (Scarso et al. 2009; Bourhis et al. 2005), none of the documents presents an empirical application of an evaluation framework. Indeed, most of the papers highlight theoretically interesting and rich ideas, but often do not built from previous work[4] and fail to apply the propositions to practical cases. Our analysis highlights a gap between the wide theoretical interest for CoPs and a rigorous agenda of empirical evaluation.

In order to draw together the main points emerging from the papers and to build our evaluation framework, we proceeded to an organic revision of the relevant information available, across disciplines, in order to identify a series of key elements and issues that emerge from Table 1. Secondly, we reorganized these elements into six 'dimensions' integrating them with our experience and propositions, in a way that is adapted to our specific aim and takes into consideration the challenges and features of transnational CoPs in health policy.

4 One reason for this could be that work on evaluation of CoPs has been done by different disciplinary areas and few authors attempted to review the work done across disciplines. This is especially true for contributions outside the health sector (e.g., in the knowledge management and business literature), which put forward new propositions and hypotheses without grounding them on the review and assessment of existing work.

Table 1: Literature included in the scoping review undertaken for the conceptualization of the framework to assess IHP CoPs and the determinants of their performance.

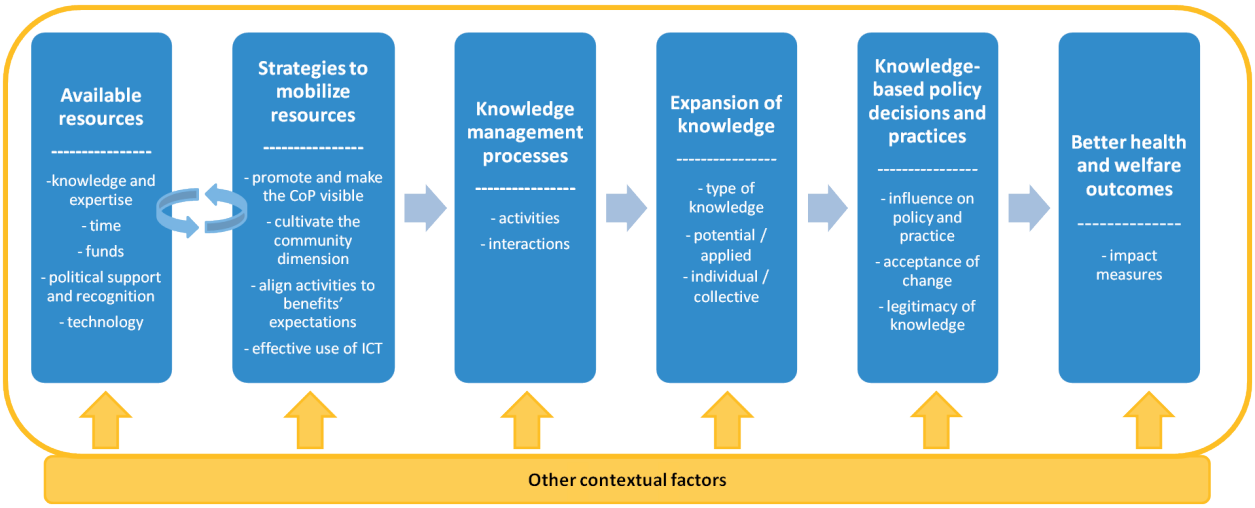
Author and year of publication	Sector of reference	Main dimension of focus	Key elements, findings and propositions
(Schenkel et al. 2000)	Management	Performance of CoPs	Social Network Analysis (SNA).
(McDermott 2002)	Business	ROI	Pyramidal framework, which starts from 'activities' at the base and moves upwards to 'outputs', 'value' and 'business results'.
(Wenger et al. 2002)	Business/ Management	ROI	Simple method for calculating an approximate ROI value.
(Arora 2002)	Business	Performance of CoPs / ROI	Balanced Scorecards (BSC).
(Millen & Fontaine 2003)	Business	Performance of CoPs / ROI	Causal model for community interactions and benefits, which categorizes benefits into 'individual/ personal', 'community', and 'organizational'.
(Lee et al. 2005)	Business/ Management	KM performance / ROI	Complex, formalized method to calculate ROI for KM activities.
(Helms 2007)	Management	Performance of CoPs / ROI	Knowledge Network Analysis (KNA).
(Scarso et al. 2009)	Business/ Management	Success factors / ROI	Identifies two external influences (the organization's own knowledge strategy and the context) and four internal/constitution characteristics of CoPs (organizational, cognitive, economic and technological dimensions) to explain the CoPs success.
(Braithwaite et al. 2009)	Health	Performance of CoPs	Protocol presenting a methodology for the "development, design, testing, refinement, simulation and application of an evaluation framework for communities of practice and social-professional networks".
(Wenger et al. 2011)	Education	Assessing "value creation"	A very detailed, comprehensive guide for promoting and assessing "value creation" (a performance measure of the level of learning enabled) for CoPs and networks in the education sector. Includes a conceptual framework and practical methods and tools.
(Ranmuthugala et al. 2011)	Health	Performance/ role of CoPs	A second study protocol (following Braithwaite et al. 2009) proposing 'realist evaluation' combined with 'social network analysis', as a tool for the development of such framework. Both protocols focus mainly on the application of CoPs to healthcare activities, specifically in Australia.
(ADB 2011)	Development	Evaluation of KM strategies	Use of the DAC Criteria for Evaluating Development Assistance as a tool for assessing KM strategies. The DAC criteria are: relevance, effectiveness, efficacy, sustainability and impact.
(LeBaron et al. 2000)	Education	Limitation of CoPs	Cultural and social values of collaboration vs. individual success.
(Yanow 2004)	Management	Limitations of CoPs / Hierarchies	Role of local vs. expert knowledge; distinction between horizontal, geographic periphery and a vertical, hierarchical periphery.

(Roberts 2006)	Management	Limitation of CoPs	Power structures and hierarchies; time needed to evolve and mature; resistance to change.
(Kerno 2008)	Management	Limitation of CoPs	Time constraints; organizational hierarchies; regional culture.
(Johnson 2001)	Education	Early research on virtual CoPs characteristics	Different levels if expertise; fluidity of knowledge flows (vs. withdrawal/ attrition); community knowledge greater than individual knowledge; environment of safety and trust.
(Sveiby & Simons 2002)	Management	Trust	Collaborative climate is one of the major factors influencing effectiveness of knowledge management.
(Levin et al. 2004)	Management	Trust	Trust as essential for knowledge sharing.
(Wenger et al. 2005)	Management	Use of ICT	Contribution of technologies to CoPs; new tools and challenges in the use of ICT; description of technologies the CoPs use to "create a sense of togetherness over time and across distances".
(Bourhis et al. 2005)	Management	Leadership	Role of the community leaders and coach to respond to challenges in an way adapted to the CoP characteristics (case studies)
(Cargill 2006)	Management	Leadership	Role of leaders and leadership issues.
(Ardichvili et al. 2006)	Management	Culture	Cultural influences and potential cultural barriers in knowledge sharing and participation.
(Usoro et al. 2007)	Management	Trust	Trust as predictor of knowledge sharing behaviors. Trust is analyzed across three dimensions: perceived competence, integrity and benevolence of the CoP.

5. PROPOSED FRAMEWORK TO ASSESS TRANSNATIONAL CoPs IN HEALTH POLICY

The conceptual framework we propose for the analysis and assessment of CoPs is represented in Figure 2.

Figure 2: a simplified graphic representation of the conceptual framework for assessing CoPs in Health Policy



The framework adopts the 'input-process-output-outcome' logic that is familiar to public health experts (Donabedian 1988) or the theory-based evaluation approach (Weiss 1998). It analyzes the role that knowledge (which is produced, created and managed through the CoPs) plays in the process of selecting and implementing health policies which, in turn, may impact on health outcomes valued by citizens. In this sense, the framework makes the CoP strategy relevant with reference to the health system goals, as defined by the WHO (WHO 2000).

Following that logic, the framework retraces the causality path between a series of dimensions that members activate to ensure the CoP functions well. However, it does not consider any elements that remain outside the control of CoP key actors – this includes other knowledge management strategies that may be in place. Moreover, contrary to analytical models of process in public health, under this framework resources are not assumed given. Instead, the challenge of the CoP is to constantly and dynamically mobilize new resources for its development and success.

The proposed framework presents links with institutional and organizational theories (Milgrom & Roberts 1992). It represents any CoP as an organizational modality that individuals set up, join, sponsor and facilitate with the aim of achieving socio-economic goals, including knowledge objectives, but also (perhaps less explicitly) normative objectives. Under the proposed framework, the hypothesis is that, in order to do so, the CoPs patrons and facilitators mobilize critical resources (such as knowledge and expertise, time, funds, political support and technologies), largely through rules and processes fostering voluntary human interactions. Thanks to its knowledge management activities, the CoP can provide its members and patrons with expanded knowledge in the domain of interest. This benefit is a major source of sustained commitment to the CoP.

Each of the dimensions of the framework (represented as boxes in figure 2) is further described in the following paragraphs. This description is followed by tables for each dimension that present a proposed list of indicators and questions that link to each element of the framework. It is important to note that these indicators are provided to illustrate and clarify the theoretical issues, and thus they should be carefully adapted for any application of the conceptual framework.

Available resources

Certain critical resources are at the base of the functioning and the effectiveness of a CoP. At this level, one mainly looks at and measures the amount of support provided by the CoP **members** and by its **patrons**.

CoP resources belong to different categories:

- *Knowledge resources* include the different types of knowledge and (formal or practical) expertise held by the CoP members. They also include access to information (such as scientific journals or guidelines) for the CoP, collectively and through its members, and any pre-existing knowledge-sharing platforms.
- *Time resources* relate to the time that members chose to allocate to the CoP activities and the time that their organizations allow them to take out of other, more formal activities.
- *Financial resources* include funds and in-kind allowances (human resources, meeting space, web space, materials and functioning items, etc.) necessary to carry out CoP activities. It is also important to evaluate the role of sponsors within the CoP: are those providing funds steering the community towards a specific agenda?
- *Political resources* refer to the buy-in of key organizations in the domain of practice of the CoP and include the public recognition and reputation of the community.
- The correct use of *technological resources* is critical for the performance of widely distributed, transnational CoPs. ICT plays a key role in connecting geographically dispersed members to create a sense of 'togetherness', as well as by providing them with a platform to share, store, access the explicit and implicit knowledge of the community (Wenger et al. 2005).

From the assessment perspective, availability of information on this dimension is critical to better understand the performance of a CoP. In particular, data on financial requirements are useful for costing and cost-effectiveness studies, while information on the profile of members is key for assessing the effectiveness of knowledge activities (respectively, dimension on 'knowledge management processes' and dimension on 'expansion of knowledge').

Methodologically, this step entails a descriptive analysis, which can be performed using relatively simple quantitative indicators. Ideally, a CoP's available resources should be measured at different stages of the CoP development. The analysis of this dimension is very closely interlinked with the following dimension of the framework, as described below.

Table 2: Measuring available resources

Element	Sub-element	Indicator
AVAILABLE RESOURCES (ideally measured at different stages of the CoP development)		
Knowledge resources	Expertise of the members	Demographics of members: number and detailed profile of members (skills, 'niche', 'know-how', years of experience in the domain, etc.) Number, % and characteristics of active members Coverage achieved by the CoP (proportion of the experts in the domain members of the community)
	Access to information	Type of information do the CoP members have access to (subscription to scholarly journals, internet access, libraries, etc.) and ease for access
Time resources	Time spent by members on CoP activities	Time spent on CoP activities by CoP members (% of total working time)
	CoP employees	Number of people employed for the CoP (full or part-time)
Financial resources	Budget	Funding: amount, predictability, fungibility. In-kind allowances to the CoP (meeting space, web space, materials and functioning, etc.): value, predictability.
	Role of sponsors	Number and identity of sponsors Other roles in the health policy process
Political resources	Buy-in of key organizations	Support and participation by organizations influential in the specific domain of knowledge
	Formal recognition	Number of quotes of CoP outputs/activities in journals and official documents
	Informal recognition/ reputation	Feedback from stakeholders (inside and outside of the community) Number of mentions of the CoPs in websites, blogs, conferences, other discussions Links to the CoP on other websites
Technological resources	ICT tools	Type of ICT tools used by the CoP and reasons for their selection (mapping can be done along categories: asynchronous/synchronous; individual participation/community cultivation – Wenger et al 2005) Synergetic approach to ICT channels. Level of internet connectivity of members in different areas and proportion of members actively using ICT tools ICT skills of participants Availability of ICT coaching to members (a person/ team or specific support activities).

Strategies to mobilize resources

A well performing CoP is able to implement strategies to successfully mobilize both available and new resources and to increase them over time.

The literature and our experience suggest that the core group of facilitators and leaders of the community plays a critical role and is instrumental in facilitating resource mobilization (Bourhis et al. 2005; Cargill 2006). This dimension thus mainly attempts to capture the role and activities of the **facilitation team**. This core group is responsible for four main tasks:

1. Defining the strategic objectives of the CoP, promoting and making the CoP visible and carrying out public appraisals and (self)assessments of the community. This is fundamental to *mobilizing financial and political resources* and to ensure its evolution and sustainability in the long term.
2. Cultivating the community dimension of the CoP and creating an environment that is conducive to knowledge exchange. This is critical to *mobilizing knowledge and time* resources by increasing the active participation of members.

   To achieve this, a few elements should be taken into consideration:
   - the *power structure* of the community. CoPs are informal organizations where the formal hierarchies are ignored to ensure wider participation. However, some members may remain in peripheral positions, reducing the effectiveness of the CoP (Roberts 2006). In the health policy domain, the community of practice may play a key role in integrating knowledge from different sources and promoting its legitimization and acceptability in the eyes of different actors.
   - the level of *trust*. Trust and a collaborative climate enable knowledge sharing, particularly of tacit knowledge (Sveiby & Simons 2002; Levin et al. 2004; Roberts 2006; Usoro et al. 2007).
   - the '*fluidity*' of the community. This measures the ease with which information and knowledge are shared among members, as opposed to 'withdrawing' or attrition (Johnson 2001). Within this dimension, cultural differences and potential cultural barriers should be taken into account (Ardichvili et al. 2006).
   - the passion for the topic, as well as commitment and *ownership* of the members are important to forge a common identity of the community (Wenger et al. 2002). This fosters a positive environment that enables good relationships so that explicit and tacit knowledge can flow within the community.
3. Aligning CoPs' activities and products to individual and organizational expectations of benefit. If individuals and organizations have (intrinsic or extrinsic) reasons to participate actively in the CoP (or to allow participation) and they value highly their participation, more *knowledge and time resources* will be mobilized. The framework allows capturing the determinants of the motivation to participate that are highlighted by the 'boxes' that follows. For example, do people participate because of the interactions (networking), the expansion of knowledge (learning), or because they care about improving policy making or about contributing to better health outcomes?
4. Choosing and adopting the relevant *information and communication technologies (ICT)*, in a manner that reaches all members and is cost-effective.

Obviously, the fact that these two dimensions (CoP resources and strategies to mobilize them) are closely related makes it almost impossible to identify their causal and chronological relationship and so they should be looked at jointly. Indeed, mobilizing new resources also means that more will be available for the CoP. For this reason, from the beginning and continuously throughout the CoP life, a sort of virtuous cycle of resource (new and existing) mobilization strategies should be in place.

As the previous one, this dimension is useful to understand the underlying determinants of the CoP performance. Again, the analysis remains mostly descriptive, although in this case qualitative aspects become increasingly relevant and require access to insider information. Qualitative and insider information can be collected by reviewing documents (published and internal) as well as through interviews.

Table 3: Describing and measuring strategies to mobilize resources

Element	Sub-element	Indicator
STRATEGIES TO MOBILIZE RESOURCES (ideally measured at different periods of the CoP development)		
Promote, assess and make visible the CoP ▸ mobilize financial and political resources	Objectives	Clear definition of the CoP objectives. When was it done? And where (documents, orally,…)? Awareness of CoP objectives among members. Alignment between CoP activities and its objectives.
	Activities	Monitoring and reporting of activities and objectives to all stakeholders (incl. members and sponsors). Accountability of the CoP.
	Budget	Annual budget produced and reviewed regularly. CoP's capacity to generate additional funds. Number and profile of people/team in charge of ensuring and mobilizing the CoP funding.
	(Self)evaluation	Regular CoP evaluations and type of evaluations (internal vs. external). Feedback of evaluation's results to members. Adoption of recommendation and evaluations results to change the practice of the community.
	Reflection	Frequency and quality of meta-conversations about the CoP.

Cultivate the community dimension ▸ mobilize knowledge and time resources	Power issues	Role or different groups, niches or agencies (e.g., equality of prominence of some over others). Role of sponsors in influencing the discussion. Way issues are brought up and discussions started.
	Hierarchy and participation	Perceptions of members about the possibility of usefully and equally contributing and that their contribution is valued. Type of participation by members: as individuals, as agencies' representatives, etc.
	Trust	Number of job ads shared Number of posts that are "personal" Number of referrals or recommendations Confidence in bringing up problems/failures and asking for advice on ongoing work Self-reported collaborative spirit Self-reported levels of trust (across three dimensions: perceived competence, integrity and benevolence of the CoP - Usoro et al 2007)
	Fluidity of the community	Language (% of messages in one language; % of messages in all languages; perception of members) Culture (presence of cultural differences in the approach to the CoP, and existence of potential cultural misunderstandings or barriers) Virtual contacts vs. contacts in person/real life New contacts made through the CoP Number and success of in-person activities vs. online activities Number of interactions between members outside of CoP activities
	Ownership/ identity Sense of belonging	Number of congratulations/condolences/etc. notes Informal meetings, dinners, lunch (outside formal CoP activities) Perception of members on their sharing a common identity. Ways this identity is created/defined.
	Confidence	Perception of members about being empowered by their belonging to the CoP.
Aligning CoP's activities to individual and organizational expectations of benefit ▸ mobilize knowledge and time resources	Value of participation	People unsubscribing (number and profile) People no longer active Statistical correlation between use of resources and participation Organizations withdrawing their support or their employers' time
	Benefits of participation	Reasons for participation (reputation, skills, networking, …) for individuals and for organizations Personal benefits (see: expansion of knowledge) Organizational benefits (see: expansion of knowledge)
Use of ICT in an effective and cost-effective manner ▸ mobilize technological resources	User-friendliness	ICT tools supported by members' hardware/software. Provision of ICT support (posts on ITC questions, coach, activities, …). Perceived user-friendliness of the community tools by members.
	"Landscape of CoP activities" (Wenger et al 2005)	Number and % of non-ICT based events vs. ICT-based tools/activities Number of participants to online tools vs. other events Geographical distribution of participants to different events/tools/activities
	Cost effectiveness of ICT	Cost of tools/software adopted (costly, free/open sources,…). Cost-effectiveness of these tools. Presence of ICT steward required to manage the technical side of the CoP. Cost-effectiveness of this investment.

Knowledge management processes

Once available and new resources are mobilized, they are then used to foster knowledge management processes, which include knowledge creation, identification, storage, share and use (Heisig 2009). Knowledge management processes materialize in the *activities* that the CoP organizes and performs (workshops, online discussions, formal meetings, websites, etc.) as well as in the *interactions* among its members (web posts, collective or private emails, formal and informal discussions, and so on). This third dimension, therefore, tries to capture the reality and nature of the knowledge activities carried out by the **active CoP members**.

The analysis of this dimension provides insights in the activities organized by the CoP and the interactions it fosters. This represents a useful measure of the CoP outputs. A well performing CoP is not necessarily focused only on the quantity of activities and interactions promoted, but also on the quality and the relevance to (1) individual members, (2) their organizations, (3) the CoP's objectives and aims. As a consequence, the CoP outputs should be assessed using quantitative indicators (for example, web hits for online activities) as well as qualitative dimensions (including objective and subjective measures of quality).

Table 4: Describing and evaluating knowledge management processes

Element	Sub-element	Indicator
KNOWLEDGE MANAGEMENT PROCESSES (ideally, measured across members belonging to the different knowledge 'niches')		
KM processes (activities and interactions)	Level of activity	Number of meetings, workshops, other activities (both in person and online, formal and informal, between a small group or involving the entire community). For example: Web page visits Number of posts/queries Number of new discussions Number and timeliness of responses Possibilities of personal interactions and networking
	Quality of interactions	Quality and usefulness of responses/debates/activities/ interactions (subjective and objective evaluation: anecdotes on useful tips, thank you notes/kudos files, user rankings, expert evaluation, citations by others) Responsiveness of interactions (i.e., rapidity of CoP reaction to new information, brought by by media, or particular event/crisis, etc.)
	Level of engagement / Relevance of activities	% of members using various resources % of members using various communication tools Average number of members involved in a discussion Length of threads Relevance of activities for the organizations that participate or allow their employees to participate. Relevance of activities to the CoP's objectives and aims.

Expansion of knowledge

Knowledge management processes aim to bring about an expansion of knowledge. The knowledge produced has different characteristics:

- It can be of *different types*: explicit or implicit; based on scientific evidence, on field experience or on experts' opinions; specific to one niche or accepted between different niches; a matter of debate or consensus within the CoP and outside.
- Knowledge within a CoP can be *potential or applied* (Wenger et al. 2011). The first refers to knowledge whose potential value could be realized later and is stored in the form of knowledge capital, which includes skills (human capital), relationships (social capital), access to resources (tangible capital) and reputational capital. In contrast, applied knowledge is fully realized and produces changes in policy and practice.
- The expansion of knowledge can be realized at *collective or individual level*. In this latter case, it is also interesting to understand who benefited from the expansion of the knowledge, i.e. whether it is only the CoP members, or some of them (and if so, which), or if the expansion had spillover effects to a wider audience. This analysis highlights important distributional and equity issues within and beyond the CoP.

Each community will focus on different knowledge characteristics among those described above, according to its specific goals, its preferences (for example, some CoPs are more focused on production and synthesis of evidence-based knowledge, while other aim to sharing implicit 'know-how' among different type of actors), and based on the individual and organizational benefits that its members expect.

The analysis of this dimension provides an ideal measure of the effectiveness (and potentially, also of the cost-effectiveness) of the CoP strategy. However, its measurement poses important methodological challenges. First of all, as mentioned, the distribution of the knowledge may not be even among members. Secondly, the intangibility of some types of knowledge (such as tacit knowledge) make measurement complex. Additionally, in order to assess 'expansion', observations at, at least, two points in time are required. Finally, there may be problems with the attribution of observed changes to the CoP. Indeed, there may be other knowledge management activities and processes outside the control of CoP which could affect the expansion of knowledge. An example may be a new training delivered by an actor outside of the CoP. On the other hand, depletion of knowledge may also occur (e.g., senior experts that leave the CoP).

Table 5: Examining and measuring the expansion of knowledge

Element	Sub-element	Indicator
EXPANSION OF KNOWLEDGE (expansion measurement required comparisons at different points of time and across individuals)		
Type of knowledge	Explicit or implicit	Means and tools of knowledge share and production, in particular for implicit/tacit knowledge (for example, by means of travel of members for consulting assignments, by trainings or study tours, or by other activities). Prevalence of one type of knowledge than the other. Reasons and consequences.
	More or less synthesized	Regular production of summaries of events and discussions (number of synthesis posts) Archives Systematic and easy-to-search databases Types of documents: report, studies, guidelines, …
	Scientific evidence, field experience, experts' opinions	Ways of producing and sharing scientific knowledge. Role of scientific evidence vs. expertise and field experience. Prevalence of one type of knowledge than the other. Reasons and consequences.
	Knowledge is harmonized and accepted between different 'niches'	Number of joint projects Number of co-authored documents Collaborative spirit % of participants from different 'niches' % of active participants from different 'niches' and their role Contribution of CoP in making knowledge holders closer. Examples. Structural patterns in the social interactions (e.g., using SNA) Interactions between 'niches' (examples).
	Debated or consensual	Number of "debate" posts/activities. Reaction to critical issues. Perception of members on posting about critical issues. Ability and interest of the community of reaching a consensus, rather than leaving controversial issues unanswered.
Potential value	Individual level	Main beneficiaries of knowledge expansion Skills/competences acquired (personal benefit) Increased speed and accuracy of work (self-reported and externally evaluated, for ex. by managers) Information received Changes in perspective New contacts made
	Organizational level	Number of outputs (documents, databases, summaries, etc.) produced Frequency of downloads Quality of outputs (perceived and objective) Coverage of relevant topics Higher level of technical capacity
Applied value	Use of CoP tools and documents	Number of contacts in database, archive, etc. Frequency of downloads Number of citations of CoP outputs in papers, articles and documents
	Actual implementation of CoP advice/best practices	Reported number of problems solved Reported number of lessons adopted Anecdotes/stories on how and why CoP was useful

More knowledge-based policies and practices

One key objective of most CoPs is to ensure that policy decisions and implementation practices have a sounder knowledge base. This may occur if **policy makers** and **implementers** are CoP members themselves or if they consider CoP members and/or their knowledge products as a reliable source of information.

Whereas scientific evidence should be a central component of this knowledge base, integrating knowledge into action involves a normative passage, equivalent to putting forward "good" or "better" policy decisions. This normative passage is quite delicate. Indeed, global health policy is an inherently 'political' arena where the political level plays a significant role in making choices. Contrary to clinical practice communities that may be able to produce and share clear guidelines and algorithms for disease treatment, CoPs in health policy do not aim to provide one answer, but look at how models, approaches and systems apply, are agreed on and evolve in different contexts and situations (Peters & Bennett 2012). However (although some CoP members could be policy-makers), members of CoPs in health policy may consider themselves technical bodies and thus may be more or less conscious of the normative stances they take.

The CoP's consciousness and ability to take normative positions will depend on its domain of knowledge, membership, facilitation, as well as on its ultimate objectives. For instance, CoPs focusing on broader issues and with a more heterogeneous membership (in terms of societal preferences) may remain relatively open to possible normative options. A more homogenous CoP focusing on a narrower domain and aiming at promoting a particular view on it can be less aware of the normative stance they are adopting – as mentioned above, passion and commitment are key resources for the CoP. In any case, to have an *impact on shaping policy and practice* and affecting health outcomes, this normative passage will occur.

To avoid the possible risks when taking this normative step, the CoP must practice self-reflection and be attentive in particular to two issues:

- One issue is the *legitimacy of the knowledge* created. How to combine 'rigorous demonstration' and 'consensus among members'? As knowledge is often incomplete and unverifiable, the risk is that opinions (put forward by dominant members or by the majority of members) are taken as validated evidence. Facilitators and members of the CoP must beware of this and play an active role in identifying opinions as hypotheses to be tested, before they become acquired knowledge and get translated into policy and practice.
- Another potential pitfall for any CoP is that of 'becoming a sect' or a *static community*, not accepting change, and resisting to different developments in the knowledge (Wenger et al. 2002; Roberts 2006). This risk may occur both during the translation of knowledge into policy and practice, but also earlier in the process when the CoP (or its facilitation team) identifies issues to prioritize in terms of knowledge activities. At this stage, the CoP may become dogmatic in its definition of relevant questions and ignore views challenging its 'good practices'.

From the evaluation perspective, focusing on this dimension would capture the 'evidence-policy' gap (or 'know-do' gap). However, methodologically, it becomes increasingly complex to isolate the contribution of the CoP from other factors. Indeed, changes in policy and practice are often incremental and factors beyond the CoP's activities contribute to policy change. Among these factors are the political economy context, the balance of powers, windows of opportunity (Kingdon 1984; Walt & Gilson 1994), as well as other knowledge sharing strategies in place at the same time (e.g., policy briefs, etc.).

Table 6: Describing and assessing knowledge-based policy decisions and practices

Element	Sub-element	Indicator
KNOWLEDGE-BASED POLICY DECISIONS AND PRACTICES		
Legitimacy of knowledge		Type of evidence mostly used as an argument in discussions. Reporting and validation of experiences/field practices of members. Ways of using "scientific" evidence. Opinions: presented as such, discussed, validated? Perception of actors (from different 'niches') about relevance and legitimacy of knowledge produced and shared.
Acceptance of innovation	Challenges and new ideas	Number of posts/activities from non-members Number of posts presenting a critique/challenge to the group Posts challenging assumptions and reactions
	Community openness	Changes in perspective (and their documentation). Community membership turn-over. Number of new members per month. Time taken by a new member to become an active participant. Participants perception about openness of the community to debate, new ideas and new members "Are we the truth-holders?"
Influence policy and practice		Development of new criteria/outcome measures in the field of interest. Contribution of the CoP work in changing the way of understanding the field of interest. Contribution of CoP in reaching a consensus (examples). Capacity to influence policy (difficult to assess, see for ex: "policy impact database") Capacity to influence implementation

Better health and welfare outcomes

Policy decisions and practices may lead to improved outcomes and reduced health inequalities. This is clearly the ultimate goal of many CoPs in health policy. Therefore, it would be ideal to be able to measure health and welfare outcomes, as well as the proportion of change attributable specifically to the CoP's activities. However, this is not realistic. In fact, it will be extremely difficult to capture the impact of the CoP on health outcomes and, in particular, to isolate it from other factors and interventions. For this last dimension, the adoption of qualitative evidence, for example in the form of anecdotes, may be more useful than applying quantitative methods or prospective research.

Table 7: Assessing better health and welfare outcomes

Element	Sub-element	Indicator
BETTER HEALTH AND WELFARE OUTCOMES		
Health outcomes		Changes in health outcomes among the population. Role of the CoP for these changes. Ways by which the CoP influenced this outcome.

6. DISCUSSION

6.1 Non-linearity of the conceptual framework

We have described and represented the role of CoPs in the process that can lead to better policies and practices and to better health outcomes as a linear sequence. However, the process we are aiming to capture is obviously far more complex and often non-linear (Grindle 2000; Ridde 2009). Many elements contribute to reinforce each other in a *dynamic* and *iterative* way. Within the framework, for example, the analysis and evaluation of health policies, practices and outcomes (the last of the framework's boxes) could produce critical information to review and improve the knowledge management activities of the CoP, thus creating a loop in the framework.

The proposed framework should therefore not be read as a chronologically linear process. For instance, the resources that are available initially are not immutable for the CoP, but they interact dynamically and can be increased through the creation of virtuous cycles. For example, public recognition is difficult to count on at an early stage of the development of a CoP, but could be successfully built by the CoP over time if the CoP is capable of producing and showing results, using other resources and pathways. In the same way, at the beginning there may only be a small group of active members in the CoP (or even just one knowledge entrepreneur). However, if the community is able to develop in the right direction (e.g., by satisfying the benefits' expectations of potential participants), it may be able to involve an increasing number of members and, thus, add to the available knowledge capital.

This argument points to an important feature of CoPs: they take time to evolve and mature. Therefore, to be effective, CoPs must be able to sustain their activities over time in order to reach their full potential or until they reach their pre-defined objectives (Roberts 2006), and their assessment should include sustainability measures (Pluye 2005). Also, as a consequence, evaluations should not focus on applying the framework chronologically (i.e., look at available resources at an early stage, focus on the knowledge management activities during the maturity stage and evaluate the impact after the end of the CoP's life), but should look dynamically at the different elements of the framework at regular intervals during the life of the CoP.

6.2 Operationalizing the conceptual framework

The proposed conceptual framework represents the first step in the process of analyzing and evaluating CoPs in health policy, that is essential to all CoPs, including those affiliated to HHA. The framework provides a conceptual basis to structure such an assessment in a way that captures and logically organizes the central elements and functions of a CoP and identifies the determinants of CoPs' potential success.

However, in order to apply the framework, it must be tailored to the assessment needs of each CoP, as well as the perspective adopted. The operationalization process begins with the 'evaluability assessment' to ensure its feasibility (Weiss 1998; Trevisan 2007). It then requires a definition of the specific needs of the exercise: Why is this analysis of the CoP being performed? For example, a CoP evaluation could be performed:

- by the facilitator as a regular monitoring and evaluation exercise to increase the relevance of CoP activities for its members;
- on behalf of community members to provide feedback and accountability;
- by an external researcher for scientific purposes;
- by sponsors to assess the relevance of their investment;
- by CoP members' employers to make sure that the CoP produces an added value for their employees;
- on behalf of decision-makers, as a quality assurance process, to ensure reliability of recommendations.

Each of these objectives requires an adaptation of the framework. Additionally, the assessment must be in line with the characteristics of the CoP in question. Each CoP presents its own features in relation to its domain of practice, approach to evidence (evidence-based or practice-based), development stage, reach, aims and objectives, etc. (for a complete typology of virtual CoPs, see Dubé et al. 2006). These features necessarily influence the type of analysis that is performed, the tools used, as well as the specific focus of the research questions.

Once the research needs and questions are defined and the basic features of the CoP described, the researcher would write a **research protocol** that fits the specific needs and is adapted to the CoP's features. The conceptual framework outlined above may be a useful tool to conceptualize the analysis and assessment of the CoP and to identify the strength and weaknesses of the CoP along the process. The following step will entail the **collection and analysis of data and information**. Clearly, this part of the process will heavily depend on the perspective, approach and protocol adopted by the researcher. Below, we provide some suggestions that could be useful and point out some methodological issues that emerge from the literature review.

Drawing from different sources (Millen & Fontaine 2003; Wenger et al. 2005; Helms 2007; Hoss & Schlussel 2009; van der Meijden & Jansen 2010; K4Health Project 2011; Wenger et al. 2011), as well as on our experience, the tables presented above (tables 2 to 7) should help to operationalize the conceptual framework, by providing a list of indicators and questions for each dimension and element. Obviously, each researcher may decide to focus on one specific aspect of the framework, rather than on its entity, as

well as to choose different disciplinary tools to perform its analysis (anthropological, economical, public health, … perspective).

Within the protocol, the researcher is also responsible for identifying or developing tools and techniques to be used to collect data in the assessment exercise. Indicators and questions in the tables include both quantitative and qualitative measures, as most scholars agree on the importance of combining quantitative measures (metrics) and qualitative narratives or stories ("systematic anecdotal evidence") and provide techniques to perform this type of analysis (Wenger et al. 2002; McDermott 2002; Millen et al. 2002; van der Meijden & Jansen 2010; K4Health Project 2011; Wenger et al. 2011). Indicators and stories are viewed as "two complementary types of data, which can be combined to build a robust picture of value creation by communities" (Wenger et al, 2011: 37).

Table 8 provides a non-exhaustive list of potentially useful strategies and methods for data collection[5].

Table 8: strategies for data collection

Source: Institutional Learning and Change Initiative (http://www.cgiar-ilac.irg/content/tools-and-methods-me); Taylor-Powell et al. 1998; Wenger et al. 2011; K4Health Project 2011

Tool	Description
Website statistics	Are useful to collect quantitative information on online interactions (number of visits, of posts, geographical location of participants, etc.). They are already built-in within most existing websites and ITC tools.
Review of documents	Can be performed on different documents ranging from CoP activities reports, CoP outputs, grey literature, published literature, etc. They are useful to collect both quantitative data (i.e., number and type of activities, participants, etc.) and qualitative information.
Surveys	Surveys are a standardized process to collect evaluative information on discreet activities or continuous processes. They can determine attitudes and concerns, behavioral changes, and levels of satisfaction.
Interviews	Many types of interviews can be performed: in-depth, semi-structured, peer interviews, focus groups, etc. by different means (face to face, over the phone, etc.). They primarily provide qualitative data, but some quantitative information may also be gathered over a various range of issues.
Participant-observation	Participant-observation is a qualitative research strategy that consists in the observation of a group in its own environment, with close, direct involvement of the observer. The researcher will try to learn insights of the dynamics of the group from an 'insider' perspective, although s/he will remain, at least partially, an 'outsider'. It usually involves different strategies: informal interviews, direct observation, participation in the activities, collective discussions, analyses of documents produced by the community, results from activities undertaken off or online, etc.
Analysis and mapping of online activities	Can be done by creating a database of all interactions and/or using mapping software, to better understands how activities take place, who participates, topics discussed, language, what are the outputs and outcomes, etc.
Thank you notes / Kudos files	Can be added to websites and groups or can be collected via email, in order for example to measure quality of outputs or to better understand the role that the community plays for its members
User rankings, expert evaluation, citations in peer-reviewed papers	Are objective and external ways to measure the quality of the CoPs outputs

5 Table 8 and 9 draws mainly on the tools provided by the Institutional Learning and Change Initiative (http://www.cgiar-ilac.org/content/tools-and-methods-me), as well as on other sources and on our experience.

Secondly, the raw data must be organized and analyzed. Many different techniques exist in the literature and can be used in conjunction with one another. Others could be developed by the researcher to respond to specific needs. Table 9 presents a (non-exhaustive) list of possible techniques for data analysis.

Table 9: techniques for data analysis

Case Studies	They provide comprehensive information about a single case. Can be used to obtain a complete picture of a collaborative development. A case study can help determine what happened and why by extending over a period of time.	Taylor-Powell et al (1998) *Evaluating Collaboratives: Reaching the potential.* Madison, WI: University of Wisconsin.
Balanced Score Cards (BSC)	BSC are a tool for strategic performance management that consists in a semi-standard structured report. It can be used to regularly keep track, in a simplified way, of activities and performance of a community.	
Sociograms	Diagrams of social interaction between people or groups of people, depicted as a visual representation of linkages. Periodically diagramming the functioning networks is useful to show changes in networks and communication over time. They can be produced with specific software. Sociograms includes: Social Network Analysis (SNA) and Knowledge Network Analysis (KNA, which maps the richness of knowledge transfers between actors)	Helms (2007) Redesigning Communities of Practice using Network Knowledge Analysis. In Kazi et al (eds.) *Hands-on Knowledge Creation and Sharing: Practical Methods and Techniques*. The KnowledgeBoard: pp.253-273. Blanchet & James (2011) How to do (or not to do)… a social network analysis in health systems research. *Health Policy and Planning,* Advance Access.
Policy Impact Database	Can be created to collect stories of how the CoP and its outputs contributed to change policy and monitor the policy impact of the CoP.	A useful example is the "Policy Impact Database" of the Health Systems 20/20 Project http://www.healthsystems2020.org/section/impact
Most Significant Change (MSC)	Identifies cases of significant/critical changes – both positive and negative – relating to key objectives. Can help track stories of changes related to less easily quantifiable issues, such as "capacity strengthening".	Davies & Hart (2004) *The 'Most Significant Change' Technique: A Guide to its Use. (http://www.mande.co.uk/docs/MSCGuide.pdf)*
Relative Scale and Ladders	A method to make a relative qualitative comparison of "before" and "after" situations. Can be used to assess qualitative aspects (e.g., empowerment, participation of marginalized groups, capacity-strengthening), which are hard to assess.	Guijt & Woodhill (2002) *Managing for Impact in Rural Development: A guide for project M&E*. Rome: International Fund for Agricultural Development.
Institutional Linkage Diagram	Illustrates the extent to which individuals, organizations, or projects interact with each other, as well as the relative importance (i.e., power dynamics) of each to the issue being evaluated. Can be used to monitor the quality of relationships and how these relationships are changing and to identify problem areas where corrective action is needed.	Guijt & Woodhill (2002) *Managing for Impact in Rural Development: A guide for project M&E*. Rome: International Fund for Agricultural Development.
Contribution Analysis	When it is not practical to design an experiment to assess performance, contribution analysis can provide credible assessments of cause and effect by verifying the theory of change that the program is based on, and paying attention to other factors that may influence the outcomes.	Mayne (2008) *Contribution analysis: An approach to exploring cause and effect*. Rome: ILAC Initiative, Brief No.16.
Outcome Mapping	The methodology is comprised of several tools, which help a project team to be specific about the targets, the changes expected and the strategies employed.	Smutylo (2005) *Outcome Mapping: A method for tracking behavioural changes in development programs.* Rome: ILAC Initiative, Brief No.7.

Source: Institutional Learning and Change Initiative (http://www.cgiar-ilac.irg/content/tools-and-methods-me); Wenger et al, 2011; K4Health Project, 2011.

6.3 Limitations and empirical challenges

A rigorous agenda of assessment of transnational CoPs in health policy is critical to understand and improve the performance of CoPs as they develop and become a focal strategy for knowledge management. The general conceptual framework proposed here is a first step that may help researchers, but also CoP facilitators and members towards this aim. However, it is important to highlight that some challenges remain.

First of all, the practical application of the framework cannot be standardized and it is left to the skills and capacities of the evaluators. Their role is to adapt the tool in a flexible way to the specific issues, challenges and environment identified for each community, drawing from different disciplines. Their role is also to interpret the results in a meaningful way in order to respond to the assessment needs of the CoP, focusing not necessarily only on the 'what?' and 'how much?' questions, but possibly also looking at processes ('how?').

The question of the "positionality" of the researcher is central to the type of evaluation performed (Walt et al. 2008). An 'insider' or 'participant observer' evaluation is necessarily different from an 'outsider' evaluation and both can be useful to achieve different objectives. However, the question lies in striking the balance between assessments by participant-observers who better understand the CoP, its dynamics and its domain of practice (as a member, the evaluator is an expert himself) and more objective, external evaluators, who may bring an independent perspective to bear on the complexity of the community.

Finally, the feasibility of the evaluation may be constrained by limits in financial and temporal resources. Ideally, a community should perform regular assessments to document the rapidly evolving processes, understand its challenges and successes and improve its effectiveness. Capacity to find sufficient resources and to conduct regular assessments is a critical skill for the community, in order to guarantee its own survival.

6.4 A first step towards empirical work

Transnational CoPs in health policy have recently witnessed rapid growth. New communities are being established and membership is increasing daily. An exhaustive mapping of such CoPs has yet to be undertaken, but several CoPs are developing under the umbrella of the Harmonization for Health in Africa (HHA) initiative. Our team's plan envisages operationalizing and field-testing the conceptual framework in the near future to respond to the evaluation needs of the HHA CoPs at two levels. From a scientific research perspective, CoPs are a research topic in their own right. Within the FEMHealth project[6], the Financial Access CoP will be under external scientific scrutiny by a researcher looking at its effectiveness as a dissemination strategy and as a tool to transform knowledge and expertise into policy-related information.

At the operational level, facilitators need to perform a self-assessment of their communities, by continuously monitoring and documenting their development to identify success factors and best practices in order to improve effectiveness. Assessing their progress so far will be of critical importance for all CoPs under HHA and their facilitators. As new lines of empirical evaluations emerge, this report provides a practical guide for CoPs to conduct such assessments based on an adaptation of the framework and tools that we present. The advantage of such an evaluation agenda lies in adopting a common framework for analysis and assessment of transnational CoPs in health policy, which would enable learning across communities. The results of the empirical application will certainly inform the discussion within and between CoPs affiliated to HHA and CoPs in health policy at large, in order to advance knowledge and improve performance.

6 FEMHealth is a European Union-funded research program launched in January 2011, which focuses on fee exemption policies for maternal healthcare in Burkina Faso, Benin, Mali and Morocco. The Work Package 5 of the project relates to the dissemination strategy of the main finding and it will adopt a CoP as an innovative approach for it. The CoP itself will be evaluated. More information on FEMHealth is available at: http://www.abdn.ac.uk/femhealth/

7. CONCLUSIONS

Effective 'knowledge production processes' are widely recognized as fundamental to improve policy and health systems. CoPs are increasingly seen as a key strategy to bridge evidence, policy-making and implementation by linking all actors of the system and creating a platform through which they transfer implicit and explicit knowledge, coordinate and collaborate towards the common purpose. CoPs have become a central component of the knowledge strategy of Harmonization for Health in Africa (HHA), with several CoPs affiliated to HHA developing at a rapid pace. Monitoring and assessing these communities and understanding the determinants of their success is of importance to respond to the challenge of building more effective and equitable health systems for all.

This report represents a first step towards creating an evaluation framework for transnational CoPs in health policy, including both those affiliated to HHA and others. It provides a conceptual framework for CoP analysis and assessment, as well as some potentially practical tools and methods for subsequent steps of the evaluation process. While building on the existing literature within and outside the health sector, our framework reflects the specific characteristics, challenges and needs of transnational CoPs in health policy, as we have learned them from our experience with HHA CoPs.

The conceptual framework captures and organizes the elements and functions of CoPs in health policy into a logical flow that links the resources available to the community and the capacity to mobilize them with the knowledge management activities and the subsequent expansion of knowledge, the changes in policy and practice and, ultimately, to health outcomes. Analyzing these elements helps the evaluator to have a better understanding of the CoP.

Further work is needed to operationalize this conceptual framework, and the empirical test would help refine and adapt it based on experience. Moreover, empirical research, including the key self-evaluations performed by CoP facilitators, will provide further information and data, and will allow learning across CoPs, on their effectiveness as a knowledge management strategy in health policy.

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