Title: Critical Collaboration model: an enhanced model to support public health collaboration

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Abstract

Public health problems are often complex and 'wicked' in nature. Wicked problems have multi-factorial causation, are dynamic and often understood and acted upon differently by different actors. Multi-sectoral collaboration is increasingly emphasised for tackling wicked problems through developing a strategic multi-sectoral plan and then taking collective action. Critical systems thinking can support the development of a shared perspective of the problem, strengthen participation in collective action and foster reflective practices to continuously improve both problem understanding and action. In this paper, we present a Critical Collaboration Model, drawing together two complementary theoretical frameworks, as well as insights from three case studies from New Zealand, to offer a systematic approach to adopting a critical systems perspective in public health collaboration. The model provides six questions to make explicit individuals' understandings or assumptions about how others perceive an issue, problem or evidence, and the process of identifying answers strengthens the dialogical and reflective aspects of the collaboration. We indicate some potential areas for the application of the model to integrate critical systems thinking in collaborative practices.

Key words: critical systems thinking, collaboration, public health prevention

Introduction

Wicked problems are complex problems that have multi-level determinants, complex causal mechanisms and delayed manifestation (Rittel and Webber, 1973; Sherman, 2016). These problems cross different sectors (such as environment, health, and education) and have a broad range of consequences. Actors[1] from across sectors, as well as within a sector, often have different understandings of wicked problems and potential solutions, which make such problems hard to design interventions for. As an example, a contemporary wicked problem is climate change (Head, 2008; Kreuter *et al.*, 2004; Levin *et al.*, 2012). In this case, perspectives differ on the relative importance of mitigation efforts compared to adaptation, on the legitimacy of different actions and on the location of responsibility (Austin *et al.*, 2019; Cotton and Stevens, 2019). As a result, health consequences from climate change may not be perceived as priorities for action from non-health actors. Commenters have identified multi-sectoral collaboration, coordination and information sharing as key for solving these wicked problems (Austin *et al.*, 2019; Australian Public Service Commission, 2007; Raisio, 2010; van Bueren *et al.*, 2003).

Public health actors have been trying to improve collaboration for addressing wicked problems (Morley and Cashell, 2017). For example, the use of a Health Impact Assessment (HIA) puts health perspectives of a proposed development or policy in front of non-health actors (Dannenberg, 2016). Health in All Policies (HiAP) is an approach that could be considered as systematising the conditions for health impacts to be considered across sectors (World Health Organisation and Finland Ministry of Social Affairs and Health, 2013). Within New Zealand, both HIA and HiAP are seen as legitimate health prevention approaches for public health agencies (The Government Inquiry into Mental Health and Addiction, 2018; Bay of Plenty District Health Board, 2016; https://www.healthychristchurch.org.nz/). However, while outlining clear plans and actions for effective multi-sectoral action is critical for collaborative action, challenges in practice remain. Some key collaboration challenges reported across New Zealand include conflicting perspectives of actors, limited resources to sustain collaboration, lack of clear communication and trust, power difference among actors affecting participatory decision-making issues and limited understanding of community context by those making the decisions (Doyle *et al.*, 2015; Murphy and Fanslow, 2012).

[1] In this paper, we use the term 'actor' to represent stakeholders and decision-makers from different sectors that influences public health such as health, environment, education, transport, economy and so on. 'Non-health actors' refer to decision-makers for whom health is not their principle purpose or framework.

The collaboration efforts by public health agencies may further be constrained by the established public health approaches and models currently in practice. For example, there is potential for HIA to highlight differing values and perspectives between those given primacy to health outcomes, and those focused on environment or economic outcomes. While practitioners engaged in HIA and HiAP may seek to move past conflict between perspectives, the frameworks themselves do not require dialogical processes that seek to create inclusive and shared understanding of an issue. Furthermore, as found in our own case studies summarised below, health expertise may be seen by other actors as marginal to their decision-making. A dialogical focus is central in critical systems approaches to collaborative planning and action on wicked problems (Innes and Booher, 2010; Jackson, 2019; Raisio, 2010; Williams and van 't Hof, 2014), and can further strengthen and complement HIA and HiAP approaches.

Systems thinking approaches are increasingly being applied to guide practitioners in addressing complex public health problems in New Zealand (Matheson *et al.*, 2019; Signal *et al.*, 2013). This paper adds to the literature by providing a model to support a collaborative and dialogical systems thinking process at a local agency level. The paper discusses public health collaboration from a critical systems perspective, then describes the development of the Critical Collaboration Model (CCM). The final section discusses implications for practice and utilisation of the CCM.

Critical systems thinking in collaborative processes

Actors across sectors tend to have differing perspectives about the nature of complex problems, their causal mechanisms and consequences (Rittel and Webber, 1973; Signal *et al.*, 2013). These different perspectives can lead to conflict or rejection of suggestions from other sectors, yet developing a shared understanding of such wicked problems is important for enabling identification of key determinants and their causal interactions. Critical systems thinking can facilitate this shared understanding and mitigate the deficiencies of traditional collaborative processes (Jackson, 2019). Systems thinking enables a holistic understanding of an issue, and *critical* systems thinking addresses power issues and the marginalisation of people and of perspectives. When some perspectives are marginalised, the holistic view of the issue is reduced, and the possible solutions limited (Midgley, 2000, 2006; Raisio, 2009).

Complex issues that emerge from the interaction of multiple and multi-level determinants require input from multiple perspectives (Byrne and Uprichard, 2012). Many health and environment issues exhibit complex causation, such as health issues emerging from urban development or agriculture, which demand holistic and systemic interventions. The time lag between causation and impacts contributes to this narrow approach, as effects are not immediately obvious. Yet economic development and rapid urbanisation in the past two centuries have come at a cost of destruction of the natural environment and climate change which was not anticipated by the human race until recently (Metz and Kok, 2008). Furthermore, in the context of colonised countries like New Zealand, the indigenous perspective on environmental management and health promotion has been marginalised by the dominant Western perspective. Māori, the indigenous people in New Zealand, have a rich knowledge system which can be utilised for the sustainable management of the local environment (Salmond *et al.*, 2019). Yet too often the Māori perspective is not given due weight in collaborative health processes, with priority being given to Western perspectives.

One way of addressing the marginalisation of diverse perspectives is to integrate critical systems approaches within established methods and tools (Midgley, 2006; Sharma and Matheson, 2016). To create systemic change for public health benefits, the mental models of non-health actors must be expanded to include health perspectives, and in return, those of health actors expanded to incorporate perspectives from non-health actors (Matheson *et al.*, 2019; Meadows, 2008). Here, a mental model is defined as an individual's mental construction or image of an external phenomenon which affects reasoning and action related to that phenomenon (Rook, 2013). However, changing mental models is difficult. What is needed is an alternative way of thinking and practice that helps take account of mental models of actors across health and non-health sectors. In addition to the established public health processes that places a health lens upon complex non-health issues, such as a HIA, we propose also establishing collaborative relationships that ensures equitable space for all, enables dialogue and creates shared understanding of issues with complex causations.

Collaborative practices for health protection

We briefly discuss here three New Zealand case studies of collaborative practice for health protection. The findings of the studies illustrated challenges and opportunities for public health expertise to engage with non-health discourses. Systematising these challenges and

opportunities demonstrated the utility of two theoretical frameworks, discussed below, which in turn contributed to development of the CCM to be presented below (Nicholas *et al.*, 2017; Nicholas and Hide, 2018). These cases involved:

- A submission for planning approval of an urban housing development, highlighting the potential health impacts
- A long-term planning process to improve on-site wastewater management
- The establishment of a regional network to support healthy housing initiatives.

These cases represented examples of collaboration initiatives by Public Health Units (PHUs) with non-health sectors. PHUs are the agencies responsible for planning, implementation and evaluation of environmental health, communicable disease control, tobacco control and health promotion programmes. PHUs are accountable to local District Health Boards which are the lead agencies responsible for health and disability service provision in defined geographical areas. The qualitative data for the case studies were collected through interviewing personnel from PHUs, local and regional councils, and through document review of the impact of such initiatives on local policy and decision-making. The data were analysed and interpreted utilizing a draft CCM model, and in the process the model was refined and enriched.

The first case study concerned a submission made by a PHU in response to a private company's application for resource consent to develop a coastal land area into a new housing and commercial development. Under the Resource Management Act 1991, resource consent applications must be made public by the local council responsible for granting the consent. Any organization or member of the public may submit their concerns in relation the application (Ministry for the Environment, 2015). There is no role as of right for public health expertise in the submission process. The case study described the experiences of the PHU as the staff prepared the submission which played a key role in influencing the housing development project managers to consider environmental health concerns. In the case study, a quality submission was possible due to the collaborative effort of a PHU and a district health board. The case demonstrated that a PHU's role in the resource consent submission process is optional and, therefore, depends on sources of motivation, expertise and legitimacy that cannot be taken for granted in the process. Such bases for being heard lay with the PHU rather than being a given.

The second case study involved a PHU successfully influencing a local council through a submission and hearing process as part of the council long term infrastructure planning. The submission focused upon improved management of on-site wastewater management systems to mitigate potential health effects. Making submissions to and participating in such a large-scale public consultation process was very demanding in time and expertise, requiring resources and collaboration beyond what was usual for a PHU. It appeared that this proved more demanding because the public health agenda had to be negotiated in relation to the long-term plan process and other priorities. This PHU sought to position public health concerns as legitimate considerations for the planning processes. The approach of the PHU was seen as that of 'persuasion' rather than one of being required, and this was seen as both a strength and a weakness. While there was a freedom to be an advocate for public health, there was also a question as to the responsibility of councils to seek public health input. Operating by persuasion required active attention to establishing and maintaining credibility and legitimacy, especially as PHUs are often perceived by non-health agencies as primarily responsible for responding to disease outbreaks instead of being involved in prevention and long-term planning. As well as a written submission, the PHU utilized their past experiences and relationships with council staff to engage effectively in the planning process.

The third case study related to early initiatives made in a PHU to draw together organisations interested in the connection of health and housing issues. Some of these issues, in particular rheumatic fever, were already a priority for many central and local government agencies, not just in the public health sector. The evidence and proposed intervention presented by the PHU was welcomed as credible and meaningful, and aligned with the perceptions held by others. Legitimacy of the initiative was supported by a mandate from central government, the involvement of a high-ranking public health officer, and perceived independence of the PHU. The PHU was therefore able to engage with and influence a wide range of non-health actors including Māori community leaders within this cross-sector collaborative healthy housing initiative.

These cases illustrate approaches to establish a 'place to stand' or to create space for public health expertise to be received by non-health actors. However, public health expertise could still be neglected or marginalised if the space so created only focused on sharing of evidence and recommendations while neglecting the power dynamics among actors or failing to develop a shared perspective with non-health actors. Further, reflective practice by public

health workers is important to engage effectively with stakeholders and to challenge taken-for-granted processes. These issues need to be factored into any successful critical system thinking collaboration model.

The Critical Collaboration Model

Here we propose a critical collaboration framework to support public health and health protection practitioners working with non-health actors, including marginalised communities. The purpose of the CCM is to prompt understanding of different perspectives, including those of the user of the model, in order to support constructive collaboration.

The findings from our case studies highlighted the importance for public health experts to establish the three qualities of salience, credibility and legitimacy in the eyes of those they wish to influence, and that this cannot be taken for granted. This is consistent with Cash et al. (2002) who established an emergent framework featuring those three qualities to manage knowledge systems. Salience concerns the relevancy of information for decision making, credibility is the perceived quality of information - for example being based on scientific evidence, and legitimacy refers to actors' perception of the process as unbiased and fair. Cash et al. argue that the three attributes (i.e. salience, credibility and legitimacy) are perceived and valued by actors differently, based on their mental models. Effective collaboration requires compromising, leveraging areas of common agreement, and meeting satisfactory levels of salience, credibility and legitimacy among actors. Although that framework proved useful in systematising and explaining our case study findings, we wanted to build on this by producing practical questions for practitioners. However, developing such questions required attention to matters of perspective (from which point of view?), relationship (collaboration questions imply the importance of other parties), and potential power differentials (not all parties in a collaboration will have equal power in the relationship). In regard to our case studies, public health was only one perspective, and not necessarily the one most pressing for decision-makers; public health sought to be taken seriously by other parties and found it useful to have existing relationships to draw on; and public health can be seen as a marginal discourse in relation to other considerations, without a statutory right to be heard, and thus lacking the power of other discourses being considered. Therefore, in our quest for practical questions for public health practitioners we needed a framework that takes account of perspectives, relationships and power.

Thus, the draft CCM was developed by combining constructs and insights from Cash et al. (2002) framework with Critical Systems Heuristics (Ulrich, 1983, 1996, 2005). Ulrich (1983, 1996, 2005) developed the *Critical Systems Heuristics (CSH)* framework to facilitate reflective practice based on systems thinking and critical philosophy. Ulrich emphasized the practice of boundary critique, where the boundary is related to how issues are defined and legitimised. Boundaries act to include and exclude different values, perspectives and mental models. CSH provides a way of critically reflecting on boundaries through a process of asking twelve questions grouped within four types of boundary issues, these being motivation, power, knowledge and legitimation. The CSH framework provides a schema to enable discussion of power, marginalisation and inclusion boundaries relating to a group decision. Ulrich summarises the "methodological core principle" of boundary critique in the form of a triangle linking boundary judgements, value judgements and relevant facts. It is this triangle that we used in developing the CCM.

The refined CCM in Figure 1 features six attributes that need to be established for a 'place to stand' for public health expertise to be received by non-health decision-makers within a collaboration. These are salience, credibility and legitimacy from the framework of Cash et al. (2002), and value judgements, boundary judgements and relevant facts, from Ulrich (1983, 1996, 2005). Each of the questions in the model is a dialogue between the two adjacent triangle points. The question of "what matters, to whom" connects salience and value judgements, "what worldview" connects value and credibility, and "what knowledge" connects credibility boundary judgements. The dialogue between boundaries and legitimacy is asked through the question of "which perspectives have power", between legitimacy and relevant facts by "who decides relevance and how", and between facts and salience by "relevant to who or what". Together, the questions make explicit the assumptions embedded in a critical decision, which stands at the centre of the model.

[Insert- Figure 1: A model for critical collaboration- here]

The primary question for public health actors during a collaboration is "Why does this matter?" It is a value judgement that establishes the motivation to be involved in an issue, and is likely to require balancing the risk to public health, the role of public health services, and the opportunity to make a positive difference. For example, social equity and justice are core

values for public health practitioners (Health Promotion Forum of New Zealand, 2012), yet not necessarily for other professionals. Therefore, PHU personnel may need to enhance the salience of social equity as well as health issues during collaborative endeavours with non-health sector personnel. Further questioning is required to consider how this salience can be enhanced. Public health personnel cannot assume that their assessment of health risks and the role of public health is shared or recognised by others involved in the situation, or that they value or appreciate the risks identified by non-health personnel. The challenge is to establish relationships and opportunities which enable mutual communication of what matters, to whom, and how risks and roles can be assessed.

Questions around credibility focus on why those with responsibility for decisions should respect the viewpoint and expertise of others. Linking to value judgement questions, which worldview would make sense of this advice; and linking to boundary judgement questions, which sources of knowledge have been (or, are to be) included or excluded. Therefore, public health personnel need to consider how the world looks from the perspective of the other decision-makers. Public health personnel may be secure in their own expertise and worldview, but the basis of that expertise and how it fits with other forms of knowledge may not be obvious to those they seek to influence. Expertise only tends to make sense within particular communities and within certain ways of seeing the world. The challenge for public health practitioners is not just to communicate their expertise, but explicitly to link this expertise to the questions that come from different worldviews, and at the same time make explicit the boundaries around their expertise.

Legitimacy is the right to be ‘at the decision-making table’, and therefore able to contribute a perspective. In a context of contested or multiple accountabilities, claims of legitimacy need to be grounded as coming from some recognisable and accepted platform. The CCM asks of collaborators which perspectives they represent, and what power is associated with that perspective. When connecting legitimacy with facts, this question becomes “how are facts validated or checked?” Legitimacy is often implied, but as part of a critical system boundary critique, these assumptions should be made explicit. In disease outbreak situations, regulations and custom give legitimacy to public health professionals to be ‘at the table’. In most other situations public health personnel need to establish their legitimacy to be at the table in other ways. Continuing with the metaphor of the table, public health personnel could be legitimately at the table as invited guests rather than as hosts. The challenge then is to

ensure that an invitation is received, and to find some ways of contributing to decision-making despite the guest status.

Public health personnel may consider that their training and professional identity make the relevance of their view seem obvious and beyond question, however the CCM prompts practitioners to consider their relevance in terms of the worldviews of those they seek to influence. When it comes to deciding what perspectives have relevance, and to whom, actors from different worlds can appear to be playing with different 'currencies'. In other words, different actors in a collaboration can assume or act as though their perspective or reasoning has more power or influence than others – their currency is worth more. The worth of anyone's currency (perspective or reasoning) is always debatable. Public health personnel have their own set of compelling arguments but cannot assume that a local government official will give these arguments the same weight. Likewise, public health personnel may 'devalue' the financial or political arguments which are of high value to the official. The challenge is to find collaborative ways of offering public health expertise in a world of multiple currencies and different values.

The way forward

Public Health is often concerned with issues that have multiple and complex causation across multiple sectors (i.e. wicked problems). It has long been recognised that cross-sector and cross-organization collaboration is required in such areas, with many efforts focussed on bringing a public health perspective and evidence to the attention of decision makers in non-health organizations. The presented Critical Collaboration Model contributes to guiding collaborative practices between health and non-health contributors in a holistic and critically systemic way that is mindful of perspectives, power and priorities. The CCM integrates the theoretical frameworks of Cash et al. (2002) and Ulrich (1983, 1996, 2005) to develop questions that make explicit underlying assumptions that influence how different collaborators perceive an issue, problem or evidence. The questions in our model were refined through application in case studies of practice, to strengthen its practical usefulness.

It should be noted that the CCM, though offered here in relation to public health, could have a wider utility. Our case studies saw the public health discourse needing to establish its salience, credibility and legitimacy because it was potentially marginalised in relation to

more dominant discourses ‘at the table’. However, true to the intent behind CSH, our model can be seen as emancipatory (Nicholas *et al.*, 2019) for those with less power in a system, and therefore is likely to be applicable to enabling other marginalised voices to achieve influence in collaborative settings.

The health system in New Zealand has been strengthening its efforts to increase equity and access to health services for Māori through policy reforms and embedding te ao Māori (Māori world views) in health action plans (Ministry of Health, 2016, 2020). For example, *Whakamaua: Māori Health Action Plan 2020-2025,* explicitly seeks to support Māori exercising their authority to improve their health and wellbeing, as well as inclusion and protection of mātauranga Māori (Māori knowledge system) throughout health and disability system. Important to achieving such outcomes is the inclusion of Māori voices and eliminating systemic biases. Dialogical spaces, with more equal power between worldviews, is one way to support intended outcomes – legitimising Māori understanding of health and environment, whilst reducing dominance of Western based perspectives. While the CCM could support effective dialogue with Māori leaders and communities, it has not yet been tested in this context.

The next step is to translate the use of the CCM into public health practice. We suggest three potential areas where the CCM could be tested and applied: firstly, reflecting on existing collaborative processes particularly with iwi/Māori; secondly, developing a toolkit for critical collaboration; and thirdly, developing a competency framework to support health professionals participating in cross-sectoral work.

The use of CCM as a reflective framework for current practice, with cycles of reflection and adaption, may be particularly useful as projects are being established and actors identified. This use of the CCM as a reflective framework is being trialled by the Institute of Environmental Science and Research (ESR) and the Ministry of Health. A co-design workshop is planned with ESR social systems science researchers and PHU public health professionals, which would reflect on current collaborative practices and co-design processes and tools for PHU critical collaboration with non-health sector organizations.

The model could also be utilized to develop a toolkit to facilitate critical system thinking practice in public health. Several methodological tools could be creatively combined using the CCM to develop a comprehensive self-assessment toolkit. For example, motivation could be identified using a prioritization matrix (Baltussen and Niessen, 2006; Minnesota Department of Health, n.d.), worldviews through rich pictures (Monk and Howard, 1998), power through the power analysis grid (Mind Tools, n.d.), and resources and collaborators through collaboration mapping (USAID LEARN, 2018). The Ministry of Health could encourage the development of a self-assessment toolkit both at national and local levels.

Finally, the CCM could support critical system thinking competencies within the public health discipline. Competency frameworks for public health professionals rarely include critical systems and dialogical approaches, despite these being essential for effective collaboration. We suggest that critical systems thinking should be part of a regular competency development programme for public health professionals. Critical systems competencies will support public health professionals to effectively support action on issues of social justice and equity, equipping them with skills to create spaces for currently marginalised perspectives during collaboration. We also suggest that collaborative relationships built on appreciation of diverse mental models will enhance the influence activities such as HIA can have on decision makers. The CCM is one tool to support such critical systems thinking in public health and we look forward to others testing its application, uses and limitations.

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Figure

Figure 1: A model for critical collaboration