How can the functioning and effectiveness of networks in the settings approach of health promotion be understood, achieved and researched?

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Summary

Networks in health promotion (HP) have, after the launch of WHO’s Ottawa Charter [(World Health Organization (WHO) (eds). (1986) Ottawa Charter on Health Promotion. Towards A New Public Health. World Health Organization, Geneva], become a widespread tool to disseminate HP especially in conjunction with the settings approach. Despite their allegedly high importance for HP practice and more than two decades of experiences with networking so far, a sound theoretical basis to support effective planning, formation, coordination and strategy development for networks in the settings approach of HP (HPSN) is still widely missing. Brößkamp-Stone’s multi-facetted interorganizational network assessment framework (2004) provides a starting point but falls short of specifying the outcomes that can be reasonably expected from the specific network type of HPSN, and the specific processes/strategies and structures that are needed to achieve them. Based on outcome models in HP, on social, managerial and health science theories of networks, settings and organizations, a sociological systems theory approach and the capacity approach in HP, this article points out why existing approaches to studying networks are insufficient for HPSN, what can be understood by their functioning and effectiveness, what preconditions there are for HPSN effectiveness and how an HPSN functioning and effectiveness framework proposed on these grounds can be used for researching networks in practice, drawing on experiences from the ‘Project on an Internationally Comparative Evaluation Study of the International Network of Health Promoting Hospitals and Health Services’ (PRICES-HPH), which was coordinated by the WHO Collaborating Centre for Health Promotion in Hospitals and Health Services (Vienna WHO-CC) from 2008 to 2012.

Key words: network analysis; settings approach; health service settings; effectiveness

INTRODUCTION

Following the launch of WHO’s Ottawa Charter (World Health Organization, 1986), networks have, especially in Europe, become a popular strategy to spread and disseminate health promotion (HP). Examples include issue-specific networks like the European network for the promotion of health-enhancing physical activity, but especially a variety of networks oriented at specific
According to the WHO HP glossary (World Health Organization, 1998), settings for health are defined as ‘the place or social context in which people engage in daily activities in which environmental, organizational and personal factors interact to affect health and well-being. A setting is also where people actively use and shape the environment and thus create or solve problems relating to health. Settings can normally be identified as having physical boundaries, a range of people with defined roles and an organizational structure. Action to promote health through different settings can take many different forms, often through some form of organizational development, including change to the physical environment, to the organizational structure, administration and management. Settings can also be used to promote health by reaching people who work in them, or using them to gain access to services, and through the interaction of different settings with the wider community’.

Accordingly, the big advantages of the settings approach are that it does not only address specific health topics or target groups, aiming at influencing individual health knowledge and behavior (as in more classical health education approaches); but by using the (usually organizational) nucleus of the setting, those structures and core processes of a setting that are of relevance to the health of the people it affects can be changed (Pelikan and Halbmayer, 1999; Pelikan, 2011). Following Nutbeam’s (Nutbeam, 1998) HP outcome model and subsequent models like the Swiss Model of Outcome Classification in HP (Spencer et al., 2007), settings cannot directly improve individual health, but they allow numerous setting-specific and individual health determinants to be addressed, including improved ecological conditions (Dooris, 2006), better access to healthy choices and better individual health literacy and behavior as a result of changed setting conditions. Linking the settings approach in HP to organizational quality management, following Donabedian’s (Donabedian, 1966) quality concept, HP can thus also be understood as a specific quality of the structures (HP teams, units, action plans), processes (specific routines and interventions) and outcomes (including health outcomes) of observed settings.

Thus, implementing the settings approach is often associated with organizational development-oriented interventions that identify and constantly improve these specific HP qualities. Following a sociological systems theory approach, an HP organizational setting would be one that includes HP criteria in all its managerial and organizational and geographical or regional administrative settings such as cities, hospitals, schools, workplaces, universities or prisons (World Health Organization, 1998; Dietscher, 2011; Dooris, 2013).

However, despite their high diffusion in HP practice, a sound theoretical basis for understanding the specific mission, structures, processes/strategies and potential outcomes or effects of networks operating in the settings approach of HP (HPSN) is still widely missing until today (Dietscher, 2012). This lack of a conceptual basis makes it difficult to adequately set up and plan for network structures, processes and interventions, to orientate them toward specified desired outcomes and to learn from comparative network research in HP.

A first interorganizational network assessment framework was proposed by Ursel Brößkamp-Stone (Brößkamp-Stone, 2004), following up on earlier work by American network scholars Catherine Alter and Gerald Hage (Alter and Hage, 1993). However, this framework was originally developed for industry and service networks and was insufficiently further developed for providing orientation on the outcomes that can be reasonably expected from HPSN, and on the strategies and preconditions that are needed to achieve them.

An altered model for conceptualizing and studying the functioning and effectiveness of HPSN —especially for networks of organizational settings—seemed therefore necessary and is proposed in the following. It was theoretically deduced from outcome models in HP (Nutbeam, 1998; Saan and de Haes, 2005; Spencer et al., 2007), social, managerial and health sciences theories of networks (Borgatti and Foster, 2003; Brößkamp-Stone, 2004; Milward and Provan, 2006; Provan et al., 2007; Turrini et al., 2009; Dietscher, 2012), settings (Pelikan and Halbmayer, 1999; Dooris, 2006, 2013; Pelikan, 2011), organizational quality (Donabedian, 1966), the concept of autopoietic self reproduction from sociological systems theory (Luhmann, 2005; Moeller, 2006) and the capacity approach in HP (Hawe et al., 1997; NSW Health Department, 2001; Bell Woodard et al., 2004; Röthlin, 2013); it was informed by a narrative review of the literature on HPSN (Dietscher 2012) and empirically applied to networks of Health Promoting Hospitals and Health Services (HPH) (Pelikan et al., 2011; Dietscher 2012) to assess its usefulness in research practice.

The article starts out with a rough description of Brößkamp-Stone’s assessment framework. It then argues why further developments of the framework for studying networks of organizational settings seemed necessary. The new model is then presented, and first experiences with its application in empirical research are described and discussed.

**BACKGROUND: HPSN**

According to the WHO HP glossary (World Health Organization, 1998), settings for health are defined as ‘the place or social context in which people engage in daily activities in which environmental, organizational and personal factors interact to affect health and well-being. A setting is also where people actively use and shape the environment and thus create or solve problems relating to health. Settings can normally be identified as having physical boundaries, a range of people with defined roles and an organizational structure. Action to promote health through different settings can take many different forms, often through some form of organizational development, including change to the physical environment, to the organizational structure, administration and management. Settings can also be used to promote health by reaching people who work in them, or using them to gain access to services, and through the interaction of different settings with the wider community’.

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professional decisions and performance (Pelikan et al., 2008), in its structures and routine processes—in the case of schools, for example, in teaching and grading pupils and students or, in the case of hospitals, in diagnosing and treating patients—thus, integrates HP into its autopoietic self-reproduction.

While the potential benefits of the settings approach usually appear comprehensible and desirable from a conceptual or health policy perspective, organizations that have their own specific purpose to fulfill may be less convinced of the necessity to invest into reorienting toward HP (Dietscher, 2011), despite the increasing body of evidence for the contribution of HP to fulfilling their organizational purpose. For example, for schools, data suggest that healthier students have better school achievements (Currie et al., 2004); for hospitals, HP interventions were shown to improve clinical outcomes (Pelikan et al., 2009).

According to capacity concepts, organizational commitment toward HP—or the lack of it—is not only linked to organization-internal capacities such as leadership or resources (NSW Health Department, 2001) but also to specific supportive capacities in relevant environments, such as the inclusion of HP in professional education and vocational training, political will or funding mechanisms in favor of HP (Bell Woodard et al., 2004). Against this background, WHO started to initiate HPSN as one strategy to bypass unsupportive conditions for HP both within organizational settings and in their relevant environmental contexts.

Such networks were defined as ‘a grouping of individual, organizations and agencies organized on a non-hierarchical basis around common issues or concerns, which are pursued proactively and systematically, based on commitment and trust’ (World Health Organization, 1998). Most of today’s well-known networks in the settings approach of HP can be traced back to WHO initiatives. Many have developed into an international umbrella with national or regional sub-networks. While the umbrella usually provides some basic orientation on concepts, contents and structure of international collaboration, the concrete support for networking organizational settings is typically provided on the level of the national or regional sub-networks. On this level, HPSN usually consist of a more or less specified number of participating organizational settings (for example, hospitals or schools or enterprises), a coordinative institution and, in some cases, also of additional partners, such as advisory boards, consultants, etc. While occasionally some individual network partners may also be involved, the main constituents of HPSN are organizations. This is why Brößkamp-Stone framed them as interorganizational networks, defined as the basic social form that enables interaction, exchange or concerted action and joint production between legally independent organizations in non-hierarchical relations to each other (Brößkamp-Stone, 2004).

In relation to the settings approach, the aim of HPSN can be conceptualized as the dissemination of HP to specific types of settings and as the support of participating organizational settings in applying the settings approach to themselves by organizational reorientation and development toward HP (Dietscher, 2012)—rather than by just implementing occasional specific HP projects or programs (Johnson and Baum, 2001).

Brößkamp-Stone’s multi-faceted interorganizational network assessment framework

Theories or conceptual frameworks to assess HPSN are scarce. Most of the available evaluation papers on specific HPSN are not based on an explicit network model. Brößkamp-Stone’s multi-faceted interorganizational network assessment framework (2004) is so far the only explicit model of that kind in the field of HP. It was applied in research practice by Stock et al. (Stock et al., 2010) in the evaluation of the German Network of Health Promoting Universities.

Brößkamp-Stone’s framework (2004) is, in large parts, adapted from earlier work by Alter and Hage (Alter and Hage, 1993). It consists of five boxes, outlining the network outcome (box V to the very right of the model) as a function of network processes and structures (boxes III and IV, vertically aligned in the middle), by that resembling a Donabedian’s quality approach (Donabedian, 1966). These structures and processes are understood as impacted by network context, especially by external control and technology (boxes I and II on the left side, again vertically aligned). The framework does however not claim to be a causal model. Rather, specific characteristics of the elements of the model (for example, strong or low levels of external control) are used to explain the development of specific patterns, types or stages of networking. With regard to the latter, three stages—exchange networks, promotional networks, and systemic networks—are distinguished. In addition, Brößkamp-Stone differentiates between internal and external as well as between soft (face-to-face) and hard (technology-supported) networking. From the different concepts combined, she deduces three network assessment principles: (i) a reasonable outcome approach; (ii) attention to development stages/levels and (iii) consideration of key factors for sustainable capacity development.
Why a new HPSN functioning and effectiveness framework?

The origins of the Brößkamp-Stone model were designed to explain motives and patterns of network cooperation in industry and service networks, with joint production or service delivery understood as the main purpose of network collaboration. However, while such joint services or products may also exist in HPSN, this paper suggests understanding the main purpose of this type of networks as achieving HP organizational change in the networking organizations.

Against this background, the structure and process components in the Brößkamp-Stone framework too seem in need of critical reflection: on the part of structures, her framework only refers to relational structures which describe the interlinks between network members, but leaves out other structural components like the amount of available network resources, or the inclusion or exclusion criteria of a given network, which may also be of potential relevance for network achievements.

On the part of processes, Brößkamp-Stone distinguishes between administrative coordination (the way network decisions are taken) and task integration (the degree to which network members contribute to joint services or products), but does not define specific processes for supporting network members in achieving the goal of organizational reorientation toward HP.

And, last but not least, studies on the functioning and effectiveness of ‘whole networks’ (as opposed to network studies focusing on individual network nodes or ‘egos’) entered the research arena only rather recently (Provan and Milward, 2001; Turrini et al., 2009) and have not yet been sufficiently incorporated into Brößkamp-Stone’s framework.

A new framework for studying HPSN functioning and effectiveness

The new framework that will be proposed in the following is based on a number of criteria: it should be specific enough to support the operationalization of indicators for empirical research on the functioning and effectiveness of HPSN, especially for the specific case of HPH. It should support the identification of reasonable network outcomes or effects in relation to the settings approach (Pelikan and Halbmayer, 1999; Dooris, 2006, 2013; Pelikan 2011) and in line with established HP outcome models (Nutbeam, 1998; Saan and de Haes, 2005; Spencer et al., 2007). It should consider available research on the functioning of HPSN (Brößkamp-Stone, 2004; Dietscher, 2011), but, because of the lack of theory in the field, also draw on wider social network research, taking a ‘whole network’ perspective (Borgatti and Foster, 2003; Milward and Provan, 2006; Provan et al., 2007; Turrini et al., 2009); and, as will be explained in more detail below, the new framework suggests understanding HPSN as a specific type of (complex) organization and therefore also builds up on concepts of organizational quality (Donabedian, 1966) and on social systems theory of organizations (Luhmann, 2005; Moeller, 2006). Last but not least, the model should of course also be connective to HP criteria and, in line with Brößkamp-Stone’s third network assessment principle, to the capacity approach in HP (Hawe et al., 1997; NSW Health Department, 2001; Bell Woodard et al., 2004).

So as the Brößkamp-Stone model, the new framework follows a quality approach. It describes specific network structures, grouped into three dimensions (Figure 1, N-STRU 1–3), as relevant background (Figure 1, R) for supporting five types of network processes or strategies (Figure 1, N-PRO 1–5). These are expected to impact (Figure 1, ‹) on two types of network outcomes (Figure 1, RNE 1–2 and PNE 1–4). The details of the framework are explained in the following.

Defining HPSN outcomes or effectiveness

This paper suggests understanding the main purpose of HPSN as the support of networking organizational settings in the comprehensive organizational reorientation and development toward HP. Therefore, such reorientation can be conceptualized as the main desired outcome or effect of HPSN. From an organizational theory perspective, this joint purpose is an organizational feature, as is the existence of (at least loosely developed) boundaries between HPSN and their environments (Scott, 1986; Preisendörfer, 2011). Thus, it makes sense to conceptualize HPSN as a specific type of (complex) organization. Taking this organizational perspective, it makes sense to conceptualize the organizational reorientation HPSN help to bring about in the organizations they work with as the result—or effect—of network production. Therefore, the new HPSN functioning and effectiveness framework proposes to refer to effects of HPSN in participating organizations as productive network effectiveness (PNE).

For empirical purposes, the PNE of HPSN can be operationalized as the development of HP organizational structures such as policies, teams, resources (Figure 1, PNE 1) and HP organizational core and support processes (Figure 1, PNE 2) in the participating organizational settings. Building up on classic outcome models in HP (such as Nutbeam 1998; Saan and de...
Haes, 2005; Spencer et al., 2007), individual outcomes, then, have to be considered as more indirect and distant HPSN outcomes that will eventually follow from changed organizational structures and processes in the participating organizations (Figure 1, PNE 3). However, one more type of PNE needs to be included in the model: the role of context or environments—such as political frameworks, funding structures, the existence—or lack—of supportive partnerships and alliances, or the general public opinion on HP—has repeatedly been discussed as a relevant moderating factor for the effective implementation of HP in organizations (Jackson and Waters, 2005). And context is also important in effectiveness research as it may help explain variation in outcomes across different observed networks (Glasgow et al., 2003). The new HPSN assessment and effectiveness framework therefore argues that HPSN cannot refine their focus solely to supporting organizational settings in their reorientation toward HP. Rather, they need to deliberately also address the environmental context of the organizations they work with in order to increase chances of reaching their main purpose of organizational change. Therefore, the new framework understands changes in the environmental context of network member organizations as one sub-dimension of PNE (Figure 1, PNE 4).

Finally, with regard to network-level outcomes or effects, it makes sense to introduce a core concept from sociological systems theory, i.e. the concept of autopoietic self-reproduction (Luhmann, 2005; Moeller, 2006): if understanding HPSN as a specific type of organizational system, according to systems theory, HPSN need to constantly reproduce themselves out of the elements they consist of, as long as they exist. Sub-dimensions of network reproduction include their ability for effective learning and adjustment to changes in relevant environments (for example the health policy context, or broader societal perceptions about health and HP), and by that to survive in time (Thomae, 1996). Another sub-dimension is their ability to attract and sustain members, since without members the network is not in existence, and has no organizations whose change it could support or impact on (Provan and Milward, 2001). Against this background, the HPSN functioning and effectiveness model suggests understanding these types of effects on the network level as reproductive network effectiveness (RNE), which has to be considered as a major prerequisite of the networks’ PNE: while ongoing production depends on constant reproduction, a network that is not able to sufficiently produce—and achieve effects—will, in the end, be unable to reproduce itself (Figure 1, ③).
Structures of relevance for HPSN functioning and effectiveness

Quality models usually frame desired outcomes—or effects—as the result of specific structures and processes (e.g., Donabedian, 1966).

As outlined, HPSN were found to have both network and organizational characteristics. This makes it necessary to observe HPSN for structures that allow capturing both of these dimensions: organizational structures as derived from concepts of organizational research (Scott, 1986; Preisendörfer, 2011); and relational structures from the younger field of social network analysis (SNA) (Scott, 2013).

For studying HPSN from an organizational perspective, the proposed functioning and effectiveness model suggests using core concepts of organizational structures, including the specific mission, aims and goals of a given network, the inclusion and exclusion criteria applied, the functional differentiation and roles (including hierarchy) in place and the resource and infrastructure equipment and technologies used (Scott, 1986; Preisendörfer, 2011). In HPSN practice, these features occur from very informal—as in the case of occasional, hardly coordinated collaboration—to highly institutionalized structures, including legally binding membership with clearly assigned rights and duties of the different parties involved. While usually starting more open, over time, networks often (but not necessarily) develop into more formalized structures (such as associations), thus tend to institutionalize their organizational features. This is especially the case if a network engages in joint initiatives or projects that imply the necessity to regulate access to budgets or other resources, or the right to participate in decision-making. Dietscher (Dietscher, 2012) suggests observing the degree of formalized institutionalization of a network—thus, the degree to which a network has developed the above-mentioned organizational features—to assess the coordination structure of HPSN on a continuum from completely informal to fully institutionalized (Figure 1, N-STRU 2).

Taking a network perspective on HPSN, concepts of SNA according to which a network is ‘a set of actors connected by a set of ties’ (Borgatti and Foster, 2003) offer a variety of specific characteristics and patterns of the relations between these actors and ties that can be used to describe a network. Some of these were also taken up in Brößkamp-Stone’s network assessment framework. These are centrality (the degree to which the flow of information or tasks is dominated by one or more network members) and connectivity (the degree to which the potential ties between the network members are actually enacted—a concept that is, in network research, more commonly referred to as density). Brößkamp-Stone’s framework also includes two more qualitative types of relational network structures, namely differentiation (the degree of functional labor division within the network) and complexity (in the sense of heterogeneity) of network partners (Brößkamp-Stone, 2004). However, since HPSN coordination units often are the only network partner with the means to systematically capture, and support, all the others, HPSN are, in practice, frequently characterized by rather high levels of centrality and rather low levels of functional differentiation. Furthermore, HPSN often are rather homogenous, as they usually involve only one type of setting. Thus, the concepts of centrality, differentiation and complexity may not sufficiently differentiate between HPSN to satisfactorily explain differences in their functioning and effectiveness. Dietscher (Dietscher, 2012) therefore suggests the degree of involvement of network members in network decision-making and performance (operationalized as the percentage of existing network structures in a given network that are involved in decision-taking and performance in specific observed areas of interest) as an additional relational network structure that may help close the gap. Furthermore, Brößkamp-Stone’s understanding of network complexity is suggested to be altered to the existence and number of network sub-structures (such as regional or thematic sub-networks) as this may better serve describing and distinguishing between different HPSN (Figure 1, N-STRU 3).

Last but not least, since the development and maintenance of network structures has to be understood as the result of processes in time, and since relational structures of HPSN strongly interrelate with network age and size, these two features have to be considered as two basic structural characteristics of HPSN (Figure 1, N-STRU 1).

Processes/strategies relevant for HPSN functioning and effectiveness

According to Donabedian’s quality scheme (Donabedian, 1966), outcomes or effects can be expected to be based on specific processes (Figure 1, ②) that are supported by structures (Figure 1, ③).

As already outlined, the PNE of HPSN is characterized by the degree to which they are able to support participating organizations in their reorientation toward HP. According to discourses of capacity-building in HP (Hawe et al., 1997; NSW Health Department, 2001; Bell Woodard et al., 2004; Röthlin, 2013), and following a social systems’ theory perspective on organizations, such reorientation will become more likely if it
is perceived as sufficiently relevant by the organizations at stake. Such perceived relevance can be derived from expected contributions of HP to desired organizational functioning and outcomes (for example financial benefits, satisfaction or better health of target groups and retention of staff), it can arise from peer pressure and competition between organizations or from externally driven needs for reorientation, such as legal requirements. Thus, for effectively supporting organizational change, networks have to find ways to increase the relevance of HP in the targeted organizations (Dietscher, 2012).

Five types of network processes/strategies that can be used for that purpose were identified through a systematic literature study and narrative review (Dietscher, 2012). The first two of these work directly with organizations and organizational staff. These are the following:

i. Supporting organizational development toward HP: this strategy can take the form of providing tools to support reorientation (such as organizational assessment forms), offering organizational consultancy or formulating specific organization-related criteria for participation in the network, such as the demand to have an organizational HP team or unit, to adhere to specific HP criteria in organizational practice or to earmark an HP budget (Figure 1, N-PRO 1).

ii. Supporting the HP training of personnel in the networking organizations, for example by providing specific competence-oriented materials and training activities for staff from participating organizational settings (Figure 1, N-PRO 2).

The next two strategies address the context—or relevant environment—of the networking organizations. These include the following:

i. Supporting lobbying and advocacy for HP: this strategy targets the area of politics and decision-making. It includes lobbying activities (for example with the aim to change legal regulations for HP, or to make funding opportunities available) and alliance building for HP (for example in the form of specific collaboration with professional associations, thematic movements and public or private funding agencies) (Figure 1, N-PRO 3).

ii. Supporting public awareness and opinion: this strategy targets the wider societal context of the networking organizations, using for example media campaigns or social media to improve public awareness and a supportive public opinion for HP (Figure 1, N-PRO 4).

iii. The last strategy identified can be framed as a background strategy to the other four. It is about supporting knowledge development by research on network activities, thus strengthening the evidence base for HP (Figure 1, N-PRO 5).

Framework summary

Summing up, the new framework is based on the presumption that effects with regard to a given network’s PNE—that is, improved HP structures and processes (and resulting individual health outcomes) in participating organizational settings, as well as changes in relevant environments of the networking organizations—will continuously impact on the network’s conditions of existence (Figure 1, @). The same holds true for the network’s RNE (Figure 1, $): if effective, PNE and RNE are understood to continuously reinforce network structures. By that, they will then enhance network processes which will further improve network outcomes—or effects—in an ongoing cycle of success. On the other hand, ineffective PNE and RNE may result in a diminishing cycle and, finally, in network closure.

First experiences with applying the framework in research practice

The HPSN functioning and effectiveness model proposed in this article was developed for researching and comparing national and regional networks of HP hospitals and health services (HPH) as one specific sub-set of HPSN (Pelikan et al., 1998; Pelikan et al., 2001; Pelikan, 2007). It was tested and applied in practice in the ‘Project on a Retrospective Internationally Comparative Evaluation Study of HPH’ (PRICES-HPH study), which was coordinated by the WHO Collaborating Centre for HP in Hospitals and Healthcare at the Ludwig Boltzmann Institute Health Promotion Research, Vienna, Austria (Dietscher et al., 2011; Pelikan et al., 2011), between 2008 and 2012. PRICES-HPH compared the effectiveness of 28 national and regional HPH networks. In this study, the HPSN effectiveness framework was used for generating indicators for the networks’ RNE and PNE as well as for their structures, processes/strategies and context, and for analyzing the impact of these on RNE and PNE.

PRICES-HPH measured PNE as the combination of the network member hospital’s degree of implementation of HP structures and their degree of meeting a predefined set of HPH strategies (Pelikan et al., 2005) and standards (Gröne, 2006), as surveyed with a self-administered questionnaire in network member organizations ($n = 180$). RNE was assessed by differentiating
between sustainable and vulnerable networks on the basis of qualitative analyses.

Data on structures and processes of national and regional HPH networks (including network size and age, specific indicators to assess the networks’ degree of formalized institutionalization and their relational structures), as well as the networks’ degrees of performance of the five introduced network strategies, were collected from network coordinators with a self-administered questionnaire. These data, as well as data on the environmental context of the networking organizations (especially national/regional legislation and funding options for HP), were used as context variables in the hospital data set to assess network impact on hospital HP structures and processes. Descriptive analyses of the data yielded high differences between the networks with regard to their context, structure and process variables, as well as to the PNE and RNE of the networks (Dietscher, 2012).

Results of the PRICES-HPH study indicate that a specific mix of the introduced network strategies had an additive effect on PNE, and that HPH networks were better able to apply these strategies, if they were of medium size (as too small networks proved unable to develop sufficient coordination structures, while too large networks seemed difficult to coordinate), had higher degrees of formalized institutionalization and levels of member involvement. Network context—especially the existence of legal frameworks for HP—had an impact too. With regard to RNE, age was identified as a major risk factor especially in networks that had not succeeded in reaching sufficient levels of formalized institutionalization, which was identified as a supportive factor for the RNE of HPSN (Dietscher, 2012).

**DISCUSSION**

The application of the new framework in research practice proved it to be a potentially powerful tool for comparative network analysis, as was successfully demonstrated in the PRICES-HPH study. In comparative network analysis, it allowed distinguishing between more or less effective networks and for generating and testing hypotheses with regard to the impact of network structures and processes on HPSN effectiveness, especially on PNE. Furthermore, the findings proved useful for formulating practice recommendations for network development (Dietscher, 2012). Thus, the framework seems to fulfill the purpose for which it was developed.

It also meets Brößkamp-Stone’s three network assessment principles: it allows the specification of reasonable network outcome or effects (principle 1) and is oriented at sustainable capacity development (principle 3). With regard to principle 2 (the consideration of developmental network stages), the new concept of formalized institutionalization appears promising, while the stages suggested by Brößkamp-Stone (Brößkamp-Stone, 2004) can be problematic in the context of HPSN. These stages—exchange networks, promotional networks and systemic networks, as adopted from the model’s predecessor by Alter and Hage (Alter and Hage, 1993)—differentiate between the degree of interorganizational collaboration in joint production or service delivery. As outlined, members of HPSN may, but do not have to engage in such activities. However, the concept of formalized institutionalization is independent of the type of interorganizational network collaboration, and, as demonstrated in PRICES-HPH, also seems to support the RNE of HPSN (Dietscher, 2012).

Some limitations have to be noted too: for some structures in the framework, the literature lacks consensus on their effective direction. There is evidence on the importance of aims and goals, professional coordination and availability of network resources (e.g. Turrini et al., 2009), so that resource-richer networks can be expected to also have better processes and better PNE and RNE. This finding is also supported by PRICES-HPH. But there is no consensus on the potential impacts of network age and size. PRICES-HPH had identified age as a risk factor to the RNE of HPSN, while a moderate network size of 20–30 members was found to best support both RNE and PNE (Dietscher et al., 2011). However, further research on these two structural components is needed. Furthermore, some of the newly proposed concepts of the HPSN framework—such as the concept of formalized institutionalization of HPSN or the degree of HPSN involvement—have, so far, only been used in the context of PRICES-HPH (Dietscher, 2012). Further research on and refinement of these concepts and on their role in network functioning and effectiveness are therefore needed.

Some methodological issues need to be mentioned too. PRICES-HPH had a comparative research design, with considerable amounts of available data (28 network cases and 180 hospitals). This enabled quantitative analyses that are not possible if studying only one network, and if only small numbers of data are available. Thus, if applying the HPSN functioning and effectiveness framework to studying single networks, a qualitative research design might be more realistic.

Finally, questions with regard to the applicability of the HPSN functioning and effectiveness framework to networks in other settings than hospitals remain. While the general pattern of the model should apply to HPSN...
across different types of settings, the indicators needed for observing the structures, processes, RNE and PNE of networks may change from setting to setting. In this respect, the HPSN effectiveness framework might also be used for defining, collecting and comparing indicators for studying network functioning and effectiveness across different types of settings, and by that support further learning about the role HPSN can have in the HP reorientation of different types of organizational settings.

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