

Health systems in context: a systematic review of the integration of the social determinants of health within health systems frameworks

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ABSTRACT

Objective. To systematically review and analyze various ways that health systems frameworks interact with the social determinants of health (SDH), as well as the implications of these interactions.

Methods. This was a review of the literature conducted in 2012 using predetermined criteria to search three comprehensive databases (PubMed, the Cochrane Database for Systematic Reviews, and the World Bank E-Library) and grey literature for articles with any consideration of the SDH within health systems frameworks. Snowball sampling and expert opinion were used to include any potentially relevant articles not identified by the initial search. In total, 4 152 documents were found; of these, 27 were included in the analyses.

Results. Five main categories of interaction between health systems and SDH emerged: Bounded, Production, Reciprocal, Joint, and Systems models. At one end were the Bounded and Production models, which conceive the SDH to be outside the health system; at the other end, the Joint and Systems models, which visualize a continuous and dynamic interaction.

Conclusions. Considering the complex and dynamic interactions among different kinds of organizations involved in and with the health system, the Joint and Systems models seem to best reflect these interactions, and should thereby guide stakeholders in planning for change.

Key words

Social policy; equity in health; health systems, trends; guidelines as topic; Americas.

Calls for action on the social determinants of health (SDH) as an integral component of the post-2015 Millennium Development Goals (MDGs) agenda indicate the urgent need for intersectoral alignment and cross-cutting action (1, 2).

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The SDH, or the “conditions in which people are born, grow, live, work, and age,” (3) are factors in the “social environment” that impact health. Factors including poverty, stress, working conditions, unemployment, social support, food, transportation, early life development, and addiction (4) have been implicated as contributors to marked differences (of a decade or more) in life expectancies between and within countries (5, 6), particularly in Latin Amer-

ica and the Caribbean (7). Collectively, the SDH present a critical challenge to health systems, national governments, and the international community (8).

Despite acknowledgement that there are multiple sectors that contribute to the social determinants, many actions to address these factors have traditionally been embedded within, or were closely related to, the health system (HS). Although some recent multisector approaches to reducing the SDH impact

have been employed (9), historically the HS has been assigned the resources and mandate to address health and disease in most settings, even when the multisector etiology of health is acknowledged (10). Given this widespread expectation, a clear framework that details the constituents and the interactions among them (11) is critical for understanding, evaluating, and strengthening the HS (12–14). Although there is no consensus as to the definition of an HS, several proposed definitions allude to the protective, restorative, and responsive roles that it plays in relation to health (15–19). While offering a general vision of the HS as a set of components with actions leading toward health, many of the proposed frameworks differ as to structure, composition, and relationships of the various parts.

As the international community broadens its attention from health (care) to the SDH, it will need practical guidance on how it can best use the array of knowledge on both SDH and HS in an integrated way to address the disparities in health within and between societies and countries (10). Sustaining any progress beyond the MDGs will require addressing the “causes of the causes” (10) by strengthening country-level systems. Such a task necessitates an understanding of HS structures, operations, their perceived and explicit boundaries, and their interactions with various determinants at local, national, and even global levels. While analyses of HS frameworks have been carried out from a strengthening (11), historical (20), and an investment (21) perspective, there has been no widely available analysis of HS frameworks in relation to social determinants and vice versa. The boundaries, interactions, and overall relationships between the SDH and HS may shape the structure, financing, activities, and evaluation of the HS. Given the impact of the MDGs on the structure and organization of health around the world (22), understanding the different HS-SDH conceptualizations may lead to better development action in 2015 and beyond.

The present study offers a systematic review of HS frameworks in relation to the SDH. It analyzes: (a) how frameworks consider the relationship between SDH and health; (b) how the HS impacts the SDH; and (c) how SDH, in turn, impact the HS.

MATERIALS AND METHODS

Data collection

The basis for this study’s data collection methodology was a systematic review that followed the Cochrane Systematic Review protocol (23) and took place over the course of 2012. The strategy was employed initially to identify English language HS articles from any part of the world that discussed a framework or an equivalent structure, and then to narrow the selection to those especially relevant for the review (23). For the initial, broad selection, any article describing or discussing health frameworks with terms such as, “health system,” “framework,” “model,” “component,” “definition,” or “indicator” was included. Articles were considered relevant to the review if they discussed a specific HS definition and framework and were published after 1980. A “definition” referred to a broad description of the overall functions and purposes of a HS. A “framework” was considered relevant if it included components, such as organizations, networks, or individuals, and any relationship between or among its components, with the explicit or implied purpose of improving health. As the inclusion or lack thereof of SDH with the HS was a central question in this review, the “social determinants of health” was not included as a search term in order to see how different frameworks considered this relationship, if at all, and to avoid selecting only articles that explicitly acknowledge and discuss this interaction.

Databases searched for this review were selected based on their level of comprehensiveness and coverage of the topic; they included PubMed, the Cochrane Database for Systematic Reviews, and the World Bank E-Library. A number of grey literature sources were also considered. Expert opinion and a snowball sampling technique were then employed to identify other relevant frameworks that may have been omitted from the initial search.

Two independent researchers participated in the article selection process. Articles excluded were those without references, those that did not present a coherent framework, and those that discussed a framework covered in another article. In the first stage of the review,

the titles of articles were screened to eliminate those irrelevant to the main topic. Then, to reduce variability between reviewers, both reviewers together screened 100 articles based on the inclusion criteria to establish procedural coherence. Subsequently, each reviewer scanned at least 20% of the other reviewer’s screening decisions. Abstracts were evaluated by the reviewers independently and eliminated if both agreed they were obviously irrelevant. In the case of a disagreement, the full-text was screened, and a third reviewer was consulted when necessary.

Data analysis

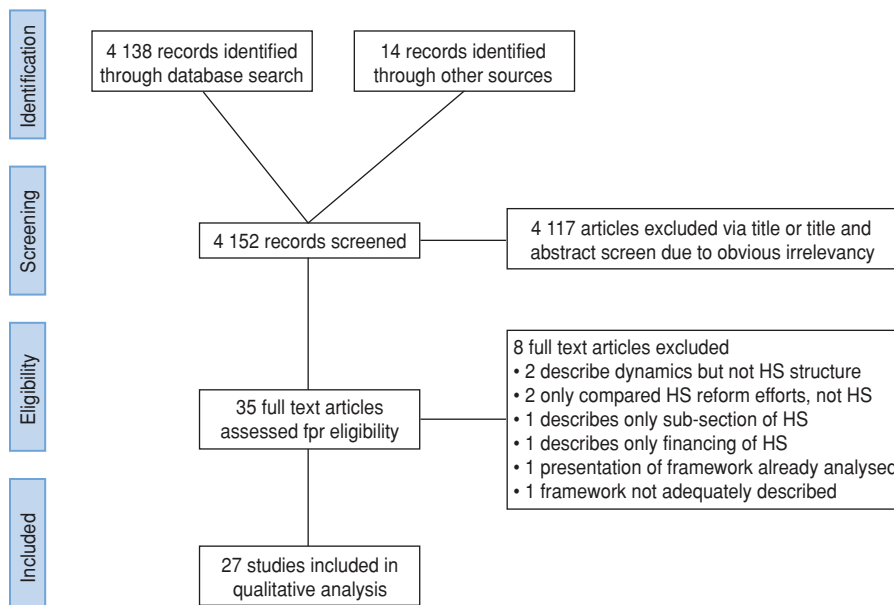
In conducting a qualitative analysis, the first author, with the assistance of other co-authors, reviewed the final 27 articles with the following questions in mind: How does the framework consider the relationship between SDH and health? How does it frame the impact that HS components may have on SDH? Does the particular framework consider the impact SDH may have on HS components? If yes, how? The key results of this analysis were included along with a short description of each study.

RESULTS

A total of 4 138 English language records were initially identified, plus an additional 14 were included via snowball sampling and expert opinion. A title or title and abstract screening of the initial 4 152 articles narrowed these down to 35 articles for full text review; finally, 27 articles remained that met the eligibility criteria by including both an HS definition and framework, as well as some mention of the SDH for analysis (7, 9, 12, 13, 16–18, 24–43). These articles were included in the final qualitative analysis (Figure 1).

The degree of integration of SDH within HS frameworks varied from little or no integration, where the SDH and HS are considered completely outside the HS or not addressed at all in the HS framework, to a significant integration of SDH in which interactions were explicitly discussed. Based on the study questions, five categories emerged from the analysis: (a) frameworks that separated the SDH from the HS completely or only included minimal interaction

FIGURE 1. Inclusion diagram for a systematic review of the integration of the social determinants of health within health systems frameworks, 2012



were categorized as using a “Bounded” model (four articles); (b) frameworks that focused on the SDH as either an input or output of the HS were categorized as using a “Production” model (seven articles); (c) the “Reciprocal” model maintains the separation described in the Production model, but considered the SDH to be simultaneous inputs and outputs (five articles); (d) articles that characterized the relationship between the SDH and HS as fluid and interactive were classified as using the “Joint” model (five articles); and (e) articles that acknowledged the Joint model, but moved beyond its components to ad-

dress the non-linear dynamics of this SDH-HS relationship were categorized as “Systems” model (six articles). A brief analysis of articles from each category is presented along with their accompanying tables:

Bounded model

Bounded HS frameworks have rigid borders between the internal functions and organization of the HS and the external milieu, such as the SDH (Table 1). These frameworks tended to exclude activities that were considered outside government control (26). The Bounded

TABLE 1. The Bounded model of integration between the Social Determinants of Health (SDH) and Health Systems (HS) frameworks, 2012

Source	Review analysis
Londoño and Frenk, 1997 (25)	The HS model based on “equity, quality, and efficiency” described in this piece can be adapted to context.
World Health Organization, 2000 (17)	The 2000 World Health Report focused on defining the boundaries and goals of the HS noting the HS is composed of “all actions whose primary intent is to improve health.”
Murray and Frenk, 2000 (26)	This article proposed a framework, including boundaries, goals, components, and functions of the HS while noting that, in some cases, for those entities whose “primary intent is to improve or maintain health,” this includes actions in other sectors.
Kruk and Freedman, 2008 (24)	This article outlined a framework for HS performance assessment although constrained the extent of this HS reach to include only functions under government control.

model suggested that more inclusive SDH frameworks may not be practical if the state can only control HS funding and administration (24).

Production model

Moving beyond the “primary purpose” definition, Production models (Table 2) have a defined relationship with the SDH (34). These frameworks postulate a casual relationship between the SDH and the HS whereby determinants such as the Physical and Social Environment (16) feed into and affect (13) the mix of interventions for health (33, 36, 44). The resulting services can then produce health, yet if they are poorly designed, these services can also impact SDH, e.g., economic vulnerability (32).

Reciprocal model

Reciprocal models (Table 3) combine these unidirectional Production models and suggest that while the SDH are external to the HS, the HS must strive to improve “broader social, political, and institutional factors” as they act in tandem with environmental factors as HS inputs and outcomes (37–40). Understanding this input-output interaction between the SDH and HS is particularly critical in evaluation, as the HS itself may lead to improvements on some SDH, but may also exacerbate others (7, 37).

Joint model

Some of the literature presented a more interwoven or joint relationship between HS and SDH (Table 4). Here the HS and population, often separated by arbitrary boundaries, are in balance; they drive the structure and outcomes of each other through their implicit and explicit actions (27, 28, 30). In this model, the relationship between poverty, education, and empowerment and the HS is explicit, with the SDH driving HS outcomes and vice versa (29, 31).

Systems model

Systems model frameworks (Table 5) suggest that the interactivity of Joint models may be mapped and, once mapped, used to drive action (9, 12). Systems models focus on characterizing

TABLE 2. The Production model of integration between the Social Determinants of Health (SDH) and Health Systems (HS) frameworks, 2012

Source	Review analysis
Roemer, 1989 (16)	This analysis suggested that population health status is the outcome of Health Services and Biological Status, as determined by the Physical and Social Environment.
Hsiao, 1992 (32)	This multi-country analysis of HS designs proposed that financing has particular implications for the HS as it may lead to economic vulnerability and access.
Roemer, 1993 (35)	Examining several different types of designs, this article suggested that any HS reflects history, economic development, and politics.
Unger and Criel, 1995 (36)	This article presented guiding ideas for HS design noting that community and context are important inputs to the health system particularly at the district level.
Melgaard et al., 1998 (33)	This piece suggested that well planned eradication programs in fragile environments can achieve their goals, but that they should consider the critical impact that the SDH have on the strength of the HS that supports eradication programs.
Handler et al., 2001 (13)	This article focused on defining the United States HS and its components noting that the HS is an "open system" with HS components influenced by the larger context.
Mills and Ranson, 2006 (34)	This overview covered key international HS types, functions, challenges, and trends noting that the HS, a product of its context, should acknowledge the SDH and distribute health appropriately.

TABLE 3. The Reciprocal model of integration between the Social Determinants of Health (SDH) and Health Systems (HS) frameworks, 2012

Source	Review analysis
Welton et al., 1997 (39)	In this article, the authors proposed a framework for the integration of public health and health delivery systems where SDH are both inputs and outcomes of community HS actions
Roberts et al., 2004 (38)	This health reform guide outlined how the HS is defined by its providers, human and financial inputs, and preventive health activities although these are influenced by (and do influence) the SDH.
Mossialos et al., 2007 (37)	The authors proposed that the SDH should be considered in the analysis of country-level policy as they have wide ranging impact on health although this impact may not be included explicitly in the HS framework.
World Health Organization (WHO), 2007 (40)	In introducing their "building blocks" approach, WHO suggested that SDH impact the burden of disease and HS response while, at times, are simultaneously important targets for achieving better health.
Pan American Health Organization, 2008 (7)	This PAHO report examined social protection programs in Latin America noting that, along with the SDH, these programs impact the interaction with the HS while the HS and protection schemes can in turn impact the SDH.

the relationship between system processes and outcomes. Often referring to the HS as a "Complex Adaptive System" (CAS), they aim to capture the potentially unpredictable ways in which self-organized yet interconnected agents may influence each other's context (18, 41, 45, 46). Here, while core HS functions and entities exist, their relationship with the SDH is defined not only by contextual factors like disease burden, resources, and expectations, but also by aspects of this interaction like feedback loops, emergent processes, and influential actors (42, 43).

DISCUSSION

Analysis of these 27 articles found that the relationship between the SDH and the HS could be classified in five categories: Bounded, Production, Reciprocal, Joint, and Systems models. Bounded models rested on clear boundaries between "primary purpose" activities and external factors. Production models retained the boundaries, but placed the HS within a larger process where it is influenced by or could influence the SDH. In Joint models, SDH were considered as dynamic, connected components of the HS. Systems

models shifted the balance even further toward processes by characterizing how the fluidity among and between the environment, actors, and institutions interacted to impact health over time.

How stakeholders—policymakers, public health practitioners, health care professionals, different organizations, and the community—confront the complex, international, and interdisciplinary nature of the SDH depends intimately on how they conceptualize the HS. The five models identified in this review offered several important conclusions about the link between the HS and SDH.

First, many of the articles reviewed here suggested that there is strong evidence for not only the relationship between the HS and the SDH, but also for the central importance of acknowledging the relationship to achieve action (2, 7, 8, 10, 47). Led by the World Health Organization, the World Bank, and other prominent theorists, the conceptualization of this relationship is generally shifting from linear models toward systems and more recently, CAS paradigms. Accordingly, Joint and Systems models, in capturing these interactions, appear more suitable for adoption and widespread use than other models that do not take into account the complex interactions between the HS and SDH. The nearly unanimous call for interdisciplinary training and collaboration to understand and manage these increasingly complex depictions of the HS further reinforces the relevance of frameworks that acknowledge this dynamic interface.

Second, as the implementation of the HS is highly dependent on context (48), all HS frameworks require some form of adaptation before they can be successfully used to guide policy. An HS framework that adequately takes into account the local structure of the SDH may lead to more efficient reform, a better service mix, and ultimately, improved health outcomes. Systems principles and tools, discussed elsewhere (41, 49–52), may be useful in gaining a thorough conceptualization of HS-SDH interactions and for guiding action.

Third, while most articles proposed or alluded to categories of SDH, there was no standardized taxonomy for the SDH across the frameworks. While a mix of selection, adaptation, and creation may be appropriate for all indicators, in practice, this lack of standardization

TABLE 4. The Joint model of integration between the Social Determinants of Health (SDH) and Health Systems (HS) frameworks, 2012

Source	Review analysis
Kleczkowski et al., 1984 (28)	This WHO published book suggested that HS includes the components that contribute to health in “homes, communities, and workplaces.”
Smith and Bryant, 1988 (30)	In this paper analyzing the intersection between primary care and disease specific programs, the HS was considered as encompassing the structures producing health, the context in which health is achieved and evaluated, and the community agents who produce this change.
World Bank, 1993 (31)	The 1993 World Development Report promoted investment in health as an essential priority for development noting education, empowerment, and poverty reduction are prerequisites for and outcomes of better health at the individual and household level.
Frenk, 1994 (27)	This article framed the HS as the relationship between providers, the population, state, resource generating organizations, and other health producing sectors arguing for the evolution of the HS and frameworks toward more population “inclusive” models.
Peters et al., 2009 (29)	This catalogue of strategies for health systems strengthening suggested that the HS, both at the micro and macro level is affected by the context, a core component of the HS.

TABLE 5. The Systems model of integration between the Social Determinants of Health (SDH) and Health Systems (HS) frameworks, 2012

Source	Review analysis
World Bank, 2007 (18)	This strategy report proposed that the HS meets all the criteria of a Complex Adaptive System (CAS).
Balabanova et al., 2009 (12)	This historical analysis detailed how development, function, and expansion of the HS are dictated by “broader environmental factors” working through non-linear feedback.
De Savigny and Adam, 2009 (41)	Using a CAS lens to model the HS, this systems thinking report noted that context has a strong influence on the HS and vice versa.
Solar and Irwin, 2010 (9)	This framework from the Commission on the Social Determinants of Health placed the HS as a SDH seeing it as one of many factors both impacting and impacted by other determinants.
van Olmen et al., 2012 (20); van Olmen et al., 2010 (42)	The framework presented in the 2010 working paper and the revision/upgrade in the 2012 article offered a view of the HS as components work together in a “reciprocal and interconnected” CAS fashion.

precludes the comparative analyses that often accompany larger scale efforts like the MDGs (48). Even when a set of indicators was proposed, they often reflected Bounded, Production, or Reciprocal models not the more contemporary Joint or Systems models that appear more theoretically relevant. Since indicators and subsequent benchmarks have, both in negative and positive ways, played a critical role in larger development agendas (22), ensuring their accuracy and completeness is a top priority. Accordingly, as geographic areas such as Latin America and the Caribbean move forward to address local and global development priorities, identifying a comprehensive yet shared set of SDH metrics will lead to better guidance and measurement of action.

Together, these points suggest that there is a dynamic, context-dependent relationship between the SDH and HS that is being overlooked or oversimplified by some frameworks. When adapted to their context, Joint and Systems models, are likely to afford a higher degree of clarity with regard to the SDH-HS relationship. Combined with pertinent, shared metrics, these frameworks are better suited to guide effective action on the SDH than other frameworks reviewed here.

Study limitations

This review has several important limitations. First, while articles were included that discuss both the HS and the SDH in some respect, it may have not always been the articles’ explicit intent to

consider this relationship. Second, as the relationship between the SDH and the HS across multiple HS frameworks has not been previously explored in the HS literature, the groupings that emerged during analysis were intended to guide discussion, but are themselves somewhat arbitrary. Further analysis may be useful in categorizing these models. Third, as certain models reflect the orientation of a particularly influential HS model, some of the frameworks presented may not truly reflect distinct conceptualizations of the HS as much as revision or reapplication of an existing framework. Finally, while the search criteria was as inclusive as possible and was supplemented by both a snowball sampling technique and expert input, some frameworks may have been unintentionally omitted.

Conclusions

This systematic review found that various HS models—classified here as Bounded, Production, Reciprocal, Joint, and Systems models—have proposed relationships between SDH and the HS. Results from this review suggest that, when preceded by a careful assessment of the interaction between the SDH and the HS, Joint and Systems models may be more useful than other frameworks in developing a better understanding of the complex interactions between them. With a clear, appropriate framework and pertinent indicators, policymakers, public health practitioners, health care professionals, different organizations, and the community will be better equipped to understand the complex challenges presented by the SDH and guide action that results in better health.

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Conflicts of interest. None.

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RESUMEN**Sistemas de salud en su contexto: revisión sistemática de la integración de los determinantes sociales de la salud en los marcos de los sistemas de salud**

Objetivo. Examinar y analizar sistemáticamente las diversas maneras en que los marcos de los sistemas de salud abordan las interacciones con los determinantes sociales de la salud (DSS), así como las implicaciones de estas interacciones.

Métodos. En el 2012, se llevó a cabo una revisión de la bibliografía mediante la adopción de criterios predeterminados para consultar tres bases de datos integrales (PubMed, la Base de Datos Cochrane de Revisiones Sistemáticas y la Biblioteca electrónica del Banco Mundial) y la bibliografía gris, en busca de artículos que incluyeran cualquier tipo de consideración de los DSS en los marcos de los sistemas de salud. Se utilizó el muestreo de bola de nieve y la opinión de expertos con objeto de incluir cualquier artículo potencialmente pertinente no detectado en la búsqueda inicial. En total, se encontraron 4 152 documentos; de estos, 27 se incluyeron en el análisis.

Resultados. Se observaron cinco categorías o modelos principales de interacción entre los sistemas de salud y los DSS: Vinculado, de Producción, Recíproco, Conjunto y de Sistemas. En un extremo se situaban los modelos Vinculado y de Producción, que contemplan los DSS como externos al sistema de salud; en el otro extremo, los modelos Conjunto y de Sistemas, que conciben una interacción continua y dinámica entre ellos.

Conclusiones. Si se tienen en cuentas las complejas y dinámicas interacciones entre los diferentes tipos de organizaciones involucradas en y con el sistema de salud, los modelos Conjunto y de Sistemas parecen reflejar mejor estas interacciones y, en consecuencia, son los que deberían guiar a los interesados directos en la planificación de los cambios.

Palabras clave

Política social; equidad en salud; sistemas de salud, tendencias; guías como asunto; Américas.