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DEVELOPMENT OF A HEALTH SYSTEM FRAMEWORK TO GUIDE THE ANALYSIS OF INNOVATION ADOPTION IN LOW AND MIDDLE INCOME COUNTRIES

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ABSTRACT

Healthcare systems face numerous challenges that put strain on the system. This is despite the countless resources that are expended on creating innovative healthcare solutions (ranging from innovative healthcare technologies, organisational innovations to pharmaceutical innovations). The literature on innovation and healthcare has shown that the adoption of innovations in practice within the healthcare system is hindered and limited. There is a need to explore and evaluate the role of the innovation system in South Africa insofar as it impacts the adoption of innovations into the national healthcare system. As a starting point, for assessing innovation adoption into health systems, it is necessary to be able to thoroughly describe a health system. In this paper a consolidated health system framework is developed. The purpose of this framework is to be utilised when developing a healthcare innovation adoption framework, i.e. as an input to the healthcare innovation adoption framework. The methodology used to develop the consolidated health systems framework are the eight phases of Jabareen's conceptual framework. Jabareen's framework is a qualitative technique for developing conceptual frameworks. The advantages of using this conceptual framework methodology include its capability to be modified, its flexibility and the focus being placed on understanding, rather than on predictions. The results of this research paper are a consolidated health systems framework which was created by considering existing health system frameworks. The consolidated health systems framework thoroughly describes all aspects of a health system by combining elements from six existing health system frameworks. The elements of the existing frameworks were categorised, integrated and synthesised, as per Jabareen's methodology, to create a complete view of a health system; which includes health processes, building blocks, intermediate objectives and goals. This paper contributes to the field of health systems engineering by providing an extensive list of existing health system frameworks and by providing a framework that combines the major aspects of a health system to thoroughly and completely describe health systems.

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1. INTRODUCTION

In order to improve a country's health system, a superior quality of research is essential [1]. Health research encourages the improvement of a country's health equity, performance and health systems [1]. Substantial advances have been made in global healthcare during the past few years, and large sums of money have been spent on healthcare research and development. During the 2015/16 fiscal year R11.3 billion was spent on research and development in South Africa, of this 18.1% was used for health research and development [2]. Even with these substantial amounts being spent on developing healthcare innovations, the innovations often do not get implemented into the healthcare system where they are needed [3]. Without good implementation practices, health research is not worth much, as Pressman & Wildavsky [4] state, good ideas have little value if they are not implementable.

The chasm between knowledge and practice means that healthcare stakeholders are not receiving the benefits from health advances - this could be in terms of costs or lifesaving technologies [5]. Clinical and scientific structures have been unable to keep up with the acceleration in new scientific discoveries and technologies. The structures, as they stand, and the available resources and work force, are unable to effectively translate the new discoveries and advancements into practice. This creates missed opportunities where people's lives and health could have been improved [6]. Barriers to innovation adoption can occur on several levels, including at patient level, departmental levels, healthcare organisational level or at policy level [7]. There is a need for a better understanding of the translation process to ensure a higher percentage of health technologies and therapies are successfully implemented [6]. A key part to understanding this translation process is understanding the health system. This paper focuses on developing a framework that effectively describes all aspects of a health system, aspects that could potentially influence the adoption of innovations into practice. This includes determining a health system's functioning and building blocks.

Forms of health systems have existed since societies deliberately attempted to protect their health and themselves from diseases [8]. Health systems as we currently know them have been moulded and refined from the late 19th century health system designs [8]. Health systems are organised differently around the world; however this is not to say that one way of organising a health system is better than another. What is important is that the health system's structure enables good performance of the system's fundamental functions [8]. Health systems are crucial in improving the health of a country [9]. From 1952 until 1992 the World Health Organisation approximated that the implementation of new technologies and knowledge into health systems accounted for half of the improvements in health globally [10]. The healthcare landscape is unstable, the path that healthcare follows is unpredictable; new opportunities, challenges, legislatures and diseases constantly arise. This unstable operating environment needs innovation [11] in order for the healthcare environment to adapt to the ever present changes accordingly.

In this paper a health system framework is constructed using Jabareen's [12] methodology for building conceptual frameworks. The developed health systems framework is the first stepping stone towards understanding how innovation adoption within healthcare works.

2. METHODOLOGY

To develop a consolidated health systems framework, Jabareen's [12] conceptual framework was used; the eight phases of the framework are displayed in Figure 1. Jabareen's [12] framework is a qualitative technique for developing conceptual frameworks. The advantages of using this conceptual framework methodology include its capability to be modified, its flexibility and the focus being placed on understanding, rather than on predictions [12].

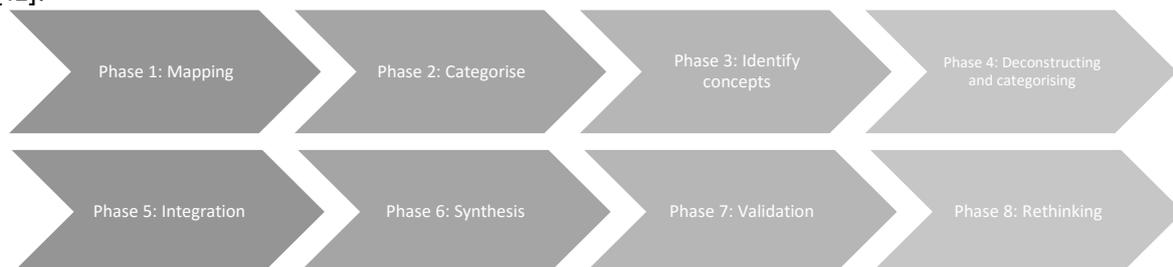


Figure 1 Conceptual framework methodology developed from Jabareen [12]

3. TOWARDS A CONSOLIDATED HEALTH SYSTEM FRAMEWORK

There has been increased international interest in healthcare systems and the frameworks that describe them [13]. How well a healthcare system performs, correlates with the achievement of health and development goals in a country [14]. Globally institutions are realising that even with health improvement initiatives which focus on particular healthcare outcomes, more effective and efficient healthcare systems are needed in order to attain and sustain healthcare goals [13]. The diversity of existing healthcare frameworks emphasise that there is no shared understanding of what health systems are - this can become problematic when different stakeholders interpret health systems differently [15]. This variety is a result of people from different regions, disciplines and timeframes understanding and interpreting health systems differently [16].

The most commonly used definition of a health system [16] is from the World Health Organisation's *World Health Report* where a health system is defined as "all the activities whose primary purpose is to promote, restore or maintain health", [17] this includes the resources, people, institutions and organisations whose principal aim is to improve health [18]. In the World Health Organisation's report *Monitoring the Building Blocks of Health Systems* the definition of a healthcare system continues and includes the supply of promotive, preventative, rehabilitative and curative care, by state and non-state actors [18].

A considerable amount of time and energy has been spent on the development of health system frameworks [15]; leading to numerous health system frameworks being published in healthcare literature [19]. The variety of existing health system frameworks present challenges as each healthcare system framework has been developed with different driving forces, in terms of emphasis, scope, usability, categories, and language [20]. However all of the frameworks aim to offer an enhanced understanding of a healthcare systems (its structure, goals and performance drivers) [15] and provide complementary health system views [20]. Among international health system frameworks there has been a substantial amount of appropriation of preceding frameworks; this suggests that some convergence in parts of the multiple health frameworks has occurred [15].

Through the research that Papanicolas & Smith [15] have conducted on health system frameworks, they deduced that there has been some convergence in the architecture, goals and problem areas of healthcare system frameworks. This convergence suggests that value obtained from developing a completely new framework is low [15]. When analysing a healthcare framework it is necessary to determine what the framework's focus and principles are as well as the understandings the author of each framework had during conceptualisation [15].

3.1. Phase 1: Mapping the selected data sources

In Phase 1 data on health systems frameworks was collected from literature sources; this was done by conducting an extensive review of the health system literature available online. Refer to Table 5 in Appendix A for the comprehensive list of health system frameworks uncovered during the literature review. From the literature search 49 health system frameworks were found. This is not to say that the list contains all of the existing health system frameworks, however this list contains the major/influential frameworks and a large variety of health system framework perspectives. Therefore these frameworks will provide a sufficient overview of the different types of health system framework literature that exists. The numerous existing frameworks serve varied purposes depending on their envisioned use, and on their intended audience; a framework will emphasise certain functions or features of the healthcare system and disregard others [19].

To complete an initial filtration process of the health system frameworks in

Table 5, the abstracts of each framework were read in order to establish whether the frameworks presented new elements or ideas, or whether the frameworks were based too heavily on preceding frameworks. Frameworks whose papers were not freely available were excluded. The frameworks were also screened in order to determine whether they made use of systems thinking, which is deemed necessary, and whether the framework was too specific to be of use (e.g. focusing on one disease). These exclusion criteria output the health system frameworks displayed in Table 6. The frameworks in Table 6 will be considered further to develop a consolidated health systems framework.

3.2. Phase 2: Extensive reading and categorising the selected data

Healthcare frameworks can be categorised as either conceptual or evaluative [15]. A conceptual framework provides an overview of the health system by describing, explaining and providing definitions for the health system [20], i.e. it is a descriptive framework. An evaluative framework is a framework that is based around actions allowing the user of the framework to evaluate and analyse aspects of the health system's performance, functions and factors [20], i.e. it is an interactive framework. A conceptual framework can be used as the

foundation of an evaluative framework. Whereas an evaluative framework can not necessarily function as a conceptual framework [15].

Health system frameworks can then be further broken down according to their goals. The framework could be created in order to understand a health system (e.g. the systems' goals, actors, functions) [16], illustrating and providing an overall understanding of the health system, without necessarily showing the manner in which the system operates [20]. The framework could be created to compare health systems (e.g. between countries) [16], by trying to establish which factors influence how efficient the health system's functions are, which allows one to understand why certain systems outperform others [20]. The framework's goal could be to inform change within a health system (e.g. policy changes) [16]; or to evaluate the system [16], by describing and analysing certain features of a health system [20].

Another method of classifying healthcare system frameworks is to determine where the boundaries of the healthcare system lie. There are no clear lines which differentiate between what does and what does not reside within a healthcare system's boundaries [14]. The complexity of health systems makes it difficult to define precisely what components they contain, and what their starting and ending points are [17]. Thus health systems have been described in numerous ways [19]. Dependant on how the health system boundaries have been set, the fundamental responsibility for health improvement would rely on different stakeholders [15]. The advantages and disadvantages of having a framework with wider and narrower boundaries as described by Papanicolas & Smith [15] are presented in Table 1.

Table 1: Implications of health system boundaries on a health system framework, adapted from Papanicolas & Smith [15]

	Narrow boundary	Wide boundary
Advantages	Stakeholders held accountable more easily.	More realistic view of the factors that impact healthcare.
	Areas where stakeholders are capable to make changes can be identified.	Relationships between institutions, people and sectors are identified.
Disadvantages	A large portion of factors that influence healthcare are not represented.	Elements included are often difficult to change in a short timeframe.
	Difficulties identifying the effect the elements have on the environment they are in.	Managerial roles are not clarified. Challenging to allocate responsibility, and to hold role-players accountable.

A narrow boundary allows for greater accountability of healthcare system role-players during improvement initiatives; however a narrow boundary can also introduce accountability complications seeing that many healthcare determinants fall outside of narrow boundaries [15]. A wider boundary allows for a more complete understanding of healthcare factors [15]. Health system boundaries can be divided into three categories [16]:

- Sub-frameworks focus on specific parts of a healthcare system;
- The frameworks category encompasses the whole healthcare system;
- Supra-frameworks are frameworks outside the limits of traditional healthcare systems: these frameworks consider how the healthcare system interacts with other societal systems.

The health system frameworks have been categorised according to their goals (understanding, comparing, informing change or evaluating) and where their boundaries have been set (sub-framework, framework, or a supra-framework). For example a framework can be categorised as an understanding supra-framework. Refer to Table 6 for the categorisation of the 26 existing health system frameworks that were output after Phase 1. A visual representation of the possible categories is show in Figure 2.

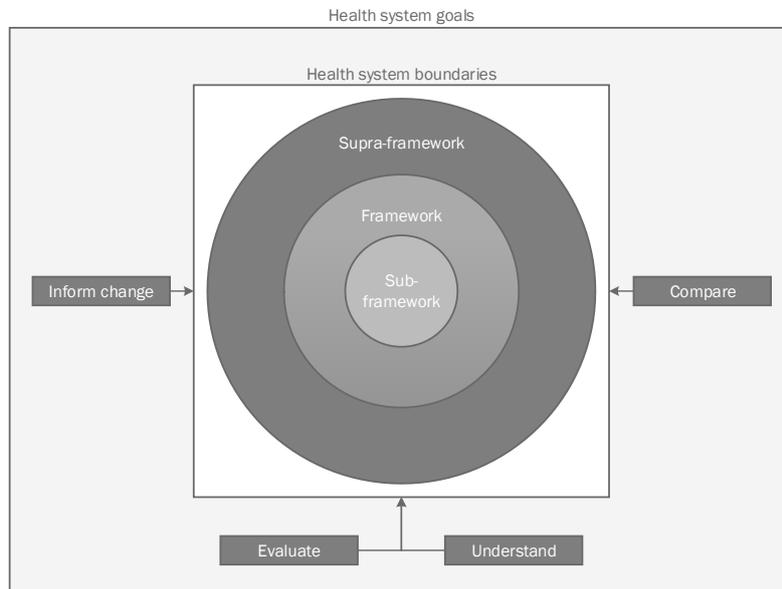


Figure 2: Framework categorisation

Each of the frameworks in Table 6 were considered in more detail in order to determine which frameworks would be used to develop the consolidated health systems framework. The criteria used to assess each framework in Table 6 consists of the following:

- The framework must account for all applicable stakeholders' perspectives [15];
- The framework should describe the objectives of the healthcare system [15];
- All significant elements of the healthcare system should be considered [15], i.e. the framework should not be too broad or vague;
- A systems thinking mind-set should be adopted¹;
 - The framework must incorporate the links between the system and the environment it exists in [9];
 - The framework must provide a holistic view of a health system (it should not be too specific);
 - The framework should enable an understanding of health systems and how the different components of the system relate and interact with one another;
- The framework should have the ability to support the assessment of healthcare systems in low and middle income countries;
- The activities included within the health system framework's boundary must be clearly identifiable [15];
- The framework's goal should correspond with the aim² of this investigation to the extent that without this correspondence, considering the framework further would not be beneficial towards developing the consolidated health system framework.

In order for a healthcare system framework to make it through this filtration step, it needs to adhere to two or more of these previously mentioned criteria. The frameworks that remained after applying the stated criteria to the health system frameworks in Table 6 are described in Table 2.

¹ It is important to assume a systems thinking perspective for healthcare systems, healthcare systems display the significant features of a complex dynamic system [9]. Systems thinking considers the context in which a system is operating and the system itself as a complex entity of interdependent and interconnected parts [9]. Systems thinking is the capability to view a system as a whole, that contains multiple interdependent and interconnected parts, and not just the individual components [64].

² The overall aim of this research is to develop a framework which analyses the system of innovation and the healthcare system in low and middle income countries insofar as these systems influence the adoption of pharmaceutical and technological innovations into the healthcare system.

Table 2: Health systems frameworks after second round of filtration

Framework	Category	Description	Source
Health systems building block framework	Understanding framework	This framework's goal is to develop a common understanding of what a health system consists of as well as areas where health strengthening measures can be applied [21]. This framework describes six building blocks (service delivery; workforce; vaccines, products and technologies; information; financing; governance and leadership), which a health system is composed of [21]. The building blocks are founded on the 2000 World Health Report, <i>Health Systems: Improving Performance</i> , each building block is necessary to improve health outcomes [21].	[21]
Control knobs framework	Evaluating framework	Roberts et al. (2002) conceptualise health systems in terms of control knobs. These control knobs are a metaphor for factors that influence a health system's performance, they are discrete aspects that significantly impact health system performance [14]. Changing the control knobs' settings (health system factors) determine how the health system functions [14].	[14]
Health systems context framework	Understanding supra-framework	The health systems context framework provides an understanding of the connections between health systems and the environment in which the system exists [9].	[9]
Health systems in transition	Comparing framework	The health systems in transition framework provides countries the ability to generate thorough descriptions of their health systems in a standard set up [22].	[22]
Health systems strengthening framework	Evaluating framework	The health systems strengthening framework is built on a foundation of four health system components. These components are stewardship and governance, monitoring and evaluation, financing system and health services [23]. Each component consists of a combination of health system processes, elements and functions; these components are identified as being the areas where health system strengthening activities can take place [23]. The health systems strengthening framework emphasises that the components are inter-related, and that adjusting one part of a component will have repercussions elsewhere in the system.	[23]
Converging health systems frameworks	Understanding Supra-framework	While Shakarishvili et al. [24] did not propose a framework in their paper <i>Converging Health Systems Frameworks: Towards A Concepts-to-Actions Roadmap for Health Systems Strengthening in Low and Middle Income Countries</i> , they compiled elements from various health system frameworks that correspond with each other.	[24]

3.3. Phase 3: Identify concepts

Each of the frameworks described in Table 2 offer complementary perspectives of health systems. The health systems building blocks framework provides a succinct way of understanding health systems. The influence of this framework can be seen in numerous other health system frameworks. The control knobs framework takes the approach of identifying which aspects of a health system can be influenced. The health systems context framework emphasises the importance of understanding the environment which the health system is operating in, as the environment will impact how well the health system operates. The health systems in transition framework is very practical in the way that it provides a structured and a reliable method of analysing a health system. The health systems strengthening framework provides an exhaustive list of health system elements and highlight the fact that all of the elements are interlinked. The converging health systems framework provides a detailed overview of health system elements.

After analysing numerous health system frameworks the concepts of a healthcare system framework that have been deemed necessary for a complete health systems view are: context, building blocks (functions), control knobs (processes), intermediate objectives and goals as displayed in Figure 3. Some frameworks would only include one of these concepts, while others would include multiple ones.

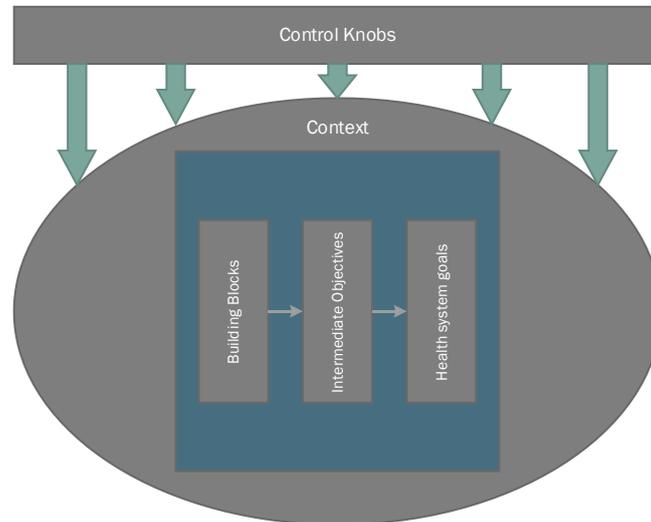


Figure 3: Consolidated health system concepts

3.4. Phase 4: Deconstructing and categorising

In order to determine what the five health system components should consist of (i.e. the health system elements that each health system component is made up from), the six frameworks in Table 2 were analysed. The health system frameworks in Table 2 are deconstructed into their basic elements, and these elements are categorised according to the health system components. Table 3 displays the elements from the health system frameworks categorised according to the proposed health system components.

Table 3: Health system framework elements categorised according to health system components

		Health system elements					
		Health systems building block framework [21]	Control knobs framework [9]	Health systems context framework [14]	Health systems in transition [22]	Health systems strengthening framework [23]	Converging health systems frameworks [24]
Health system component	Context		Economic; Legal and regulatory; Political; Demographic; Technological; Epidemiological; Socio-demographic; Environmental;		Political; Health status; Socio-demographic; Economic context; Geography;		
	Control knobs - Processes		Financing; Organisations and regulations; Resource; Provision;	Financing; Payment; Organisation; Regulation; Behaviour;			Resource creation; Resource allocation; Payment; Organisation; Integration; Regulation; Behaviour;
	Building blocks - Functions	Service delivery; Health workforce; Information; Medical products,			Organisation and governance; Financing; Physical and human resources;	Health services; Stewardship and governance; Financing system; Monitoring and evaluation;	Services; Health workforce; Health information; Technologies and commodities;

		vaccines, technologies; Financing; Leadership and governance;			Provision of services; (has sub-elements for each building block)	(has sub-elements for each building block)	Demand generation; Financing; Governance;
	Intermediate objectives	Access; Coverage; Quality; Safety;	Equity; Choice; Efficiency; Effectiveness;	Efficiency; Quality; Access;			Equity; Efficiency; Sustainability; Quality; Access; Coverage; Safety; Choice;
	Health system goals	Improved health; Responsiveness; Social and financial risk protection; Improved efficiency;	Health; Financial risk protection; Consumer satisfaction;	Health status; Customer satisfaction; Risk protection;			Better health; Financial protection; Responsiveness; Satisfaction;

3.5. Phase 5: Integrating

All of the health system elements in Table 3 were deliberated in order to create the consolidated health system elements displayed in Table 4. Table 4 shows the consolidated elements of each health system component and provides a brief description of how the elements were chosen.

Table 4: Consolidated health system elements

	Elements	Comments
Context	Political [9] [22] Health status [22] Sociodemographic [9] [22] Economic context [9] [22] Geography [22]	The factors from Thomson et al. [22] framework were used as the base for the context component; their report made it clear as to what these factors entail. However there are a lot of Atun & Memable's [9] factors that overlap.
Control knobs: Processes	Resource creation [9] [24] Resource allocation [24] Payment [14] [24] Financing [9] Organisation [9] [14] [24] Integration [24] Regulation [14] [24] Behaviour [14] [24]	Shakarishvili et al. [24] combined elements from both Atun & Memable [9] and Roberts et al. [14], it was therefore deemed appropriate to use Shakarishvili et al. [24] elements as the basis for the control knobs component with the exception of financing which was added to the list.
Building blocks: Functions	Service delivery [21] [22] [23] [24] Information [21] [24] Physical resources [21] [22] [24] Human resources [21] [24] [22] Financing [21] [22] [23] [24] Leadership and governance [21] [22] [24]	WHO's [21] building block elements were used as the basis for the building blocks component. The health systems building blocks framework has been influential in health systems framework literature, this can be seen through Thomson et al. [22], Shakarishvili et al. [23], Shakarishvili et al. [24] building blocks, which all relate to WHO's [21] building block elements.
Intermediate objectives	Equity [9] [24] Efficiency [9] [14] [24] Sustainability [24] Quality [21] [14] [24] Access [21] [14] [24] Coverage [21] [24] Safety [21] [24] Choice [9] [24]	Here Shakarishvili et al. [24] successfully combined WHO [21], Roberts et al. [14] and Atun & Memable [9] intermediate objectives.

Health system goals	Improved health status [21] [9] [14] [24] Responsiveness [21] [24] Social and financial risk protection [21] [9] [14] [24] Improved efficiency [21] Consumer satisfaction [9] [14] [24]	The health system goals elements are based on WHO's [21] elements with the exception of customer satisfaction which was first proposed by Roberts et al. [14]. Again it can be seen that multiple frameworks have overlapping health system goals.
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3.6. Phase 6: Synthesise

In this phase the concepts, components and elements are synthesised into a theoretical framework. The consolidated framework was developed by considering the following objectives:

- The framework can support the assessment of healthcare systems in different sub-Saharan African countries;
- The framework can be linked to or integrated with a system of innovation;
- The framework provides a holistic view of the healthcare landscape (framework cannot be too specific);
- The framework enables an understanding of the health system and how the different components of the system relate and interact with one another;
- The framework contributes to the development of a tool that assesses the role of a healthcare system and an innovation system in the adoption healthcare innovations.

Figure 4 shows the Consolidated Health Systems Framework (CHS Framework) and the interactions between the health system components.

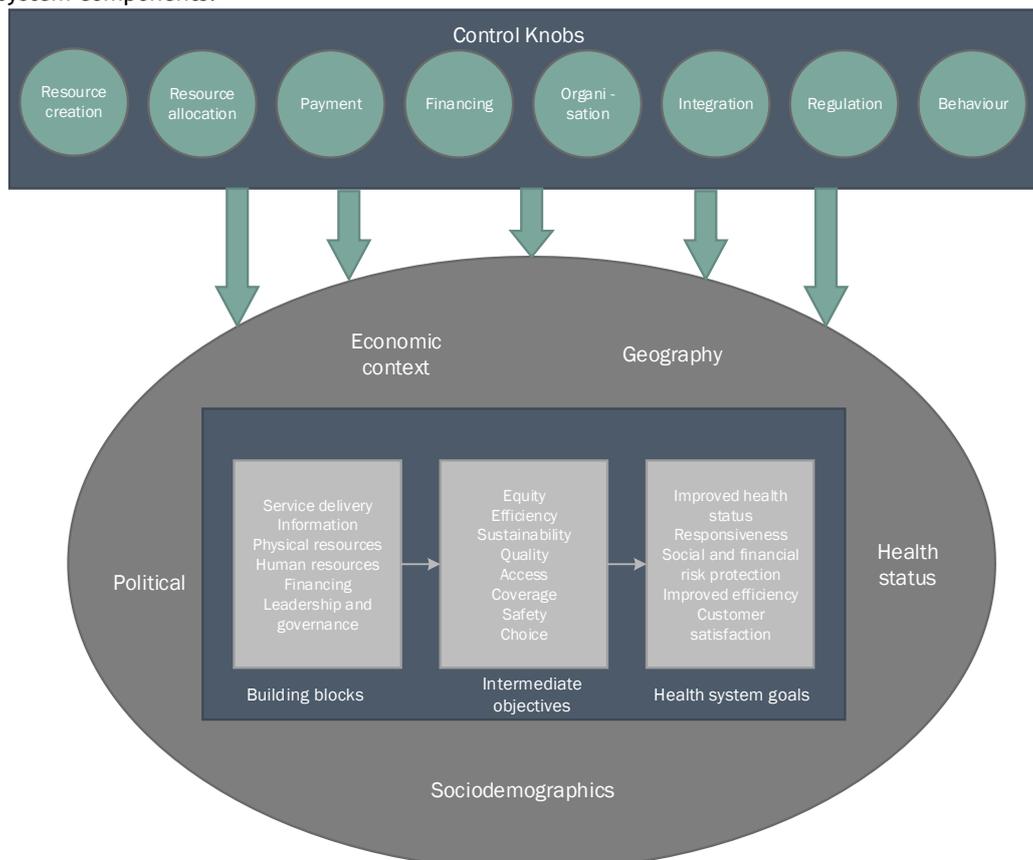


Figure 4: Consolidated health system framework (CHS Framework)

3.7. Phase 7 and 8: Validating and rethinking

Phases 7 and 8 do not come into play yet. Validation and rethinking the CHS Framework will take place when the framework for health innovation adoption is developed. The consolidated health systems framework is an input for the development of the innovation adoption framework. Validation and rethinking of the CHS Framework (along with the other inputs) will have to occur within the context of innovation adoption, when developing the overall innovation adoption framework.

4. CONCLUSIONS

A considerable amount of time and energy has been spent on the development of health system frameworks [15]; leading to numerous health system frameworks being published in healthcare literature [19]. The variety of existing health system frameworks present challenges as each healthcare system framework has been developed with different driving forces, in terms of emphasis, scope, usability, categories, and language [20]. Among international health system frameworks there have been a substantial amount of appropriation of preceding frameworks; this suggests that some convergence in parts of the multiple health frameworks has occurred [15].

The aim of this research paper was to develop a consolidated health systems framework using existing frameworks which were found in literature to create a framework that combines all major aspects of a health system to thoroughly and completely describe health systems. In Section 3.2 the existing health system frameworks were categorised. One of the criteria for the categorisation was where the boundaries of the health system framework have been set. The boundaries could be at sub-framework level (focus on specific parts of a health system), at framework level (encompasses the whole healthcare system), or at supra-framework level (considers how the healthcare system interacts with other societal systems). Sub-frameworks were deemed too specific, supra-frameworks were deemed too vague, and frameworks were deemed to be missing aspects or elements necessary to appropriately describe a health system; an ideal framework would include the details of the framework level while still considering the aspects of a supra-framework i.e. the context of the health system. Rather than choosing an existing health system framework, combining numerous frameworks to create a comprehensive framework was deemed best, as none of the analysed frameworks contained all the elements that were found across the various evaluated frameworks. This meant being able to get the best aspects of the supra-framework and of the framework categories in the CHS framework.

As per the name of the developed framework, the *Consolidated Health System Framework*, this framework consolidates all aspects (elements and components) of previous frameworks to provide a comprehensive, consolidated view of the health system. Jabareen's [12] methodology for building conceptual frameworks was followed. The 49 frameworks found through the literature search were filtered down to six health system frameworks. The details of these six frameworks were used, deconstructed, categorised and integrated to form a single consolidated health systems framework. The consolidated health systems framework is the first stepping stone towards understanding how innovation adoption within healthcare works. The CHS Framework differs from the existing health system frameworks in the way that it thoroughly and comprehensively describes a health system. This is due to the CHS Framework being developed by combining elements from preceding health system frameworks. The consolidated health systems framework is an improvement on existing frameworks as it displays an overview of a health system, using concepts and elements from the existing frameworks in such a way that a new thorough representation of a health system, that can be used for a variety of purposes, has been created. None of the analysed frameworks in Table 2 contain all of these elements and concepts in a single framework. The developed framework can be used by future researchers when an overview of a healthcare system is required. Recommendations for future work would be to use this framework in the context of an actual healthcare system to determine whether there are still aspects missing. Further the consolidated health systems framework needs to be rethought and validated by health industry experts in future work.

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6. APPENDIX A: Health system frameworks

Table 5 List of existing health system frameworks

	Framework	Source
1	Actors framework	[25]
2	Analysing health systems to make them stronger	[26]
3	Assessing governance in developing countries' health systems	[27]
4	Behavioural healthcare framework	[28]
5	Comparing healthcare systems with resource profiles	[29]
6	Component elements of health systems	[30]
7	Control knobs framework	[14]
8	Converging health systems frameworks	[24]
9	Core Functions framework	[31]
10	Country level analysis of healthcare financing	[32]
11	Dimensions of health system reform	[33]
12	Distributional aspects of national health insurance	[34]
13	Econometric model of the healthcare system	[35]
14	Effect of National Health Insurance on Medical Care	[36]
15	Essential functions of public health	[37]
16	Essential Public Health Functions	[38]
17	Framework for high performance health system in the United States	[39]
18	Framework for monitoring and evaluating performance	[40]
19	Global trade and health	[41]
20	Health policy and system performance	[42]
21	Health priority setting	[43]
22	Health system framework to improve maternal, neonatal and child health (MNCH)	[19]
23	Health system functions and goals	[17]

24	Health system governance	[44]
25	Health system key institutional components	[45]
26	Health system performance measurement and management	[46]
27	Health system shelter	[47]
28	Health systems and their context	[9]
29	Health systems in transition	[22]
30	Health systems strengthening framework	[23]
31	Healthcare and the macro-economy	[48]
32	Healthcare expenditure and health outcomes	[49]
33	Healthcare organisation performance framework	[50]
34	Healthcare system reform	[51]
35	Human resources and health outcomes	[52]
36	International health system performance comparison	[53]
37	Monitoring and evaluating framework of health systems strengthening	[54]
38	OECD Health Care Quality Indicators Framework	[55]
39	Primary healthcare	[56]
40	Public health grid	[57]
41	Stewardship health system framework	[58]
42	Strengthening health systems	[59]
43	Structured pluralism model of healthcare systems reform	[60]
44	The Global Fund health systems strengthening	[13]
45	The health impact pyramid	[61]
46	The World Bank: healthy development	[62]
47	WHO health performance framework	[8]
48	WHO health system building blocks	[21]
49	WHO primary healthcare framework	[63]

Table 6 Health systems frameworks after first round of filtration

	Framework	Type of framework	Source
1	Actors framework	Understanding framework	[25]
2	Analysing health systems to make them stronger	Informing change framework	[26]

3	Behavioural healthcare framework	Evaluating framework	[28]
4	Component elements of health systems	Understanding framework	[30]
5	Control knobs framework	Evaluating framework	[14]
6	Converging health systems frameworks	Understanding supra-framework	[24]
7	Core Functions framework	Informing change framework	[31]
8	Dimensions of health system reform	Informing change sub-framework	[33]
9	Econometric model of the healthcare system	Understanding sub-framework	[35]
10	Essential Public Health Functions	Evaluating framework	[38]
11	Framework for monitoring and evaluating performance	Evaluating framework	[40]
12	Health system framework to improve maternal, neonatal and child health (MNCH)	Evaluating sub-framework	[19]
13	Health system functions and goals	Understanding framework	[17]
14	Health system governance	Understanding framework	[44]
15	Health system key institutional components	Informing change supra-framework	[45]
16	Health systems and their context	Understanding supra-framework	[9]
17	Health systems in transition	Comparing framework	[22]
18	Health systems strengthening framework	Evaluating framework	[23]
19	OECD Health Care Quality Indicators Framework	Evaluating supra-framework	[55]
20	Public health grid	Informing change sub-framework	[57]
21	Stewardship health system framework	Understanding supra-framework	[58]
22	Structured pluralism model of healthcare systems reform	Informing change framework	[60]
23	The Global Fund health systems strengthening	Evaluating supra-framework	[13]
24	WHO health performance framework	Evaluating framework	[8]
25	WHO health system building blocks	Understanding framework	[21]
26	WHO primary healthcare framework	Informing change sub-framework	[63]



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