Chapter 9 – Prospects and Examples

Having presented the theory in the previous chapters, its application to health systems, and methodological issues, this chapter gives examples of the use of the theory to assess interventions, research and development projects. The examples were taken from publications in the health systems literature and projects in which the author was involved.

With international development aid's continuous attention to health systems thinking and health systems strengthening, it is necessary to review the paradigms by which health systems have so far been approached. Concepts such as autopoiesis and operational closure acknowledge social systems' autonomy and vital dynamics for their existence and reproduction. Researchers, observing health systems (from inside or outside) need to realize that systems are not amenable to interventions that do not recognize their autonomous and self-organizing nature. They are often confronted with realities that lead them to acknowledge that the systems are active in the selection of what is relevant for them. Observers, who are not part of the system, and therefore do not participate in the autopoiesis of the system and its organizations, cannot solve the problems. Even if aid is needed, provided and welcome, only the system can put it to good use. Detached from ideological orientations, the theory gives substantive arguments in this direction.

From the literature, 12 texts were selected and are presented as examples of how Social Systems Theory can offer new insights on the respective health system topics. The articles and reports were chosen for the relevance of the themes in the current international health context. Several constructs of the Social Systems Theory are used, particularly the central concepts: autopoiesis, self-reference, observation, communication, differentiation, operational closure, complexity, organization, decision-making, etc. Given the scope of this book, the texts present summary discussions. Particular attention is given to three of the texts, which are discussed in more detail.

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9.1 Dual practices

Health professionals' double employment links (usually one job in the public sector and another in the private sector) and remuneration are the topics of a paper by L. Paina et al. (2014) focusing on Uganda. The paper concludes that, despite government efforts to prevent or control dual practices, they linger on because public and private sector incentives, financial and non-financial alike, are complementary and health professionals find ways of carrying on with them. Agreeing with the presented empirical evidences, Social System Theory analysis would take into account the relevance of membership and the decision-making prerogatives for autopoiesis of the organizations with which the health professionals establish their dual links. In both public and private entities the professional members are participants in the autopoietic reproduction of the organizations. They maintain that the duality does not compromise the autopoiesis of the individual organization of which they are members. In that sense, dual practices are issues that the *function system* and healthcare provider organizations do not need to care much about. Dual practices are not self-referentially problematized into the service provider *organizations* carrying out their individual reproduction. As long as the professionals come along and perform a "fair deal" regarding the expected duties, there is no need to pressure them to follow more strictly their contracts and associated expectations. The health organizations know well that health professionals are scarce and not readily available in the labour market. The political system (a distinct function system compared to the health system) instead, responding to the media and to pressures external to the health system, tries to intervene. This is described in Paina et al.'s paper. However, the political system does not succeed in influencing the reproductive dynamics of the health organizations. Public and private healthcare service provider organizations are not, jointly or individually, under the same pressure to address the issue as the political system is. However, as is usually the case in political systems, topics have a short life span and are soon replaced by emergent issues that capture public attention and shift the pressures on the politicians to focus on the new topics. Often the political system enacts policies or legal instruments and moves on to other concerns without assuring proper follow-up and implementation of past decisions. This is also well described in the paper, which narrates empirical observations on how managers adapt to the dual practices. The theory would foresee such an outcome by considering the way the health and polit-

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ical systems as well as public and private organizations work as autopoietic operationally closed systems.

9.2 Accreditation of health facilities

Attempts to introduce accreditation of health facilities is likely to face difficulties and perhaps insurmountable barriers if they do not pay attention to the self-observation and self-organization capabilities of organizations, and the vital importance of these functions in their self-reference. In this regard, accreditation is a suitable topic for an analysis of self-observation. Accreditation sets standards to be adopted as references for internal and/or external evaluation of healthcare service providers. It requires and implies that the provider refers and communicates about itself using the language and terms the accreditation evaluation guidelines prescribe. Without a self-reference perspective, accreditation initiatives and studies do not apprehend the core dynamic of the process. An example of that is the article on accreditation practices in Kerala, India, by Sindhu Joseph (2021). It reports on a cross-sectional study including accredited (312) and non-accredited (309) primary (community health centre) and secondary (general, women and children, and small hospitals) public healthcare facilities. According to the article, a questionnaire asked patients' views on ten dimensions: physical facility, admission services, patient centredness, accessibility of medical care, financial matters, professionalism, staff services, medical quality, diagnostic services and patient satisfaction. The answers were given on a 5-point scale (1 = strongly agree to 5 = strongly disagree). The results showed that the median score of dimensions of accredited primary healthcare facilities in the structure, process and outcome domains are higher than for the non-accredited hospitals. The study also found significant differences between the scores for these same three domains in accredited and non-accredited primary healthcare institutions but absent in secondary care institutions. The paper concludes that the accreditation process needs to be improved. Social System Theory would call our attention to the observers. The researchers as observers of observers could choose between inquiring into the patients or the professionals – two different sets of observers with surely different perspectives. The researchers, external observers themselves, would need to realize that the communications established with patients and/or staff have different structures. Staff possibly would not be interested in revealing sensitive information related

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to accreditation processes to an external observer; and patients would have biased, perhaps poorly informed, understanding of the issues at stake in the assessed dimensions. Social System Theory provides valuable orientation for such assessments.

9.3 Check-up programme in Albania

This example is a reflection on how political decisions taken by the political system may not be in line with health systems strengthening, as the Systems Theory would see it. The Ministry of Health implemented a compulsory medical check-up programme for a segment of the adult population in Albania. The programme defined the exams in the routine check-up without doctors making decisions on the individual laboratory and other exams to request. By introducing a pre-defined set of exam prescriptions, the programme removed the prerogatives of the medical doctors to decide on what the patient actually needed (or not) based on clinical evaluations of the patients. Not all patients would be required to undergo the same examinations, if that decision depended exclusively on the doctors' observation of indicative signs of possible disorders and needs of further investigation. The resources wasted on unnecessary examinations could have been used instead for appropriate follow-up of symptomatic patients or those who had already started treatment. In that regard, with the excuse of offering a comprehensive check-up for all citizens over 45 years of age, the programme in fact took away from the medical professionals some of their otherwise standard procedure of ordering examinations. The reduction in the prerogatives of the health professionals to make all decisions concerning every individual patient represents a decrease in the level of complexity that the health system was already perfectly capable of taking responsibility for. This demonstrates how the de-differentiation of the two distinct functional systems, the political and the health systems, can have negative effects on the system that in consequence loses the scope of its distinct prerogatives. The conclusion to be drawn here is that the Ministry of Health, a participant in the political system to a greater extent than it is a participant in the health system, has the themes of the communications of the political system closer to its core concerns than the actual communications delivering the health codes in diagnostic and treatment contexts. The example is based on direct experience of the author while managing a project to strengthen the pri-

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mary healthcare service provision in the country, and was published in a local newspaper.

9.4 Universal Health Cover (UHC)

This example uses Social System Theory to reflect on political system approaches to health systems concerns in a globalized context; the discussion does not focus on any specific paper however. The intention is to bring to the fore the differences in the perspectives of political players communicating at international level and those communicating in the actual operations of the health systems at country level. The argument is that the need to set new semantics and orientation of communications in the international arena differs from the needs of decision-makers dealing with the limits in the capacity of their countries' public health systems to tackle actual health problems in the context of the structures they already have in place. We refer to the differentiation of two distinct functional systems (political and health), where the problems concerning the political international players are not the same as the health systems on the ground have to cope with. An impressionist portrayal of this configuration would picture two independent "parallel universes" of communications, pursuing their unconnected individual reproduction, while trying to have some influence on each other. While in the political system the political legitimacy and general acceptance of the themes and decisions are at stake, in the country's health system, the daily reproduction of the medical communications and related actions has the unquestionable priority. The complexities addressed by these two systems are also very different. Policy-making at international level requires complex communications among various interests – complexity reduction in this context aims at narrowing down the sets of meaningful themes that can be commonly addressed and reasonably understood and shared. The complexity reduction for the health system "on the ground" consists in reproducing the communications that are already redundant (i.e. with established, stable meanings) while guardedly incorporating new meanings. Successes in these two "parallel universes" are measured differently; while in international politics, governments signing official declarations, incorporating some of the UHC semantics in policy documents and official speeches, is already counted as success, even if these changes in communications at the level of political systems do not translate into corresponding changes at health systems level. By fully adopting UHC promises to

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provide all healthcare needed by anyone, a public health system brings the full weight of complexities to its table. This presents an overwhelming challenge, and health systems are uninterested in getting too bogged down in operational and pragmatic terms, or effectively try to comprehensively deliver. Although a valid horizon to be reached in an undetermined future, the achievements can be only and perhaps frustratingly partial. The main argument presented in this section is that while UHC works well at the level of international macro-political agreements, it is destined to fail at implementation level because of unreachable targets. Here Social Systems Theory would emphasize the need to pay attention to the domains of communications and the observers operating in them.

9.5 Governance and informal payments

This example discusses a case of autopoiesis orienting the way a health system finds solutions for its survival. The example focuses on Tajikistan, where a public health system surviving a civil war in the midst of government collapse, informally adopted practices to carry on working independently from government funds. The health system survived with the incorporation of informal payments into its normal functioning. The health facilities were not maintained; the government could not do that. Salaries were sometimes not paid for months. To retain minimal working conditions, health staff had to contribute part of the money collected from patients. These practices remained in place well after the end of the civil war, while the government budget continued to be too low to pay salaries, maintain structures and equipment, and make badly needed investment. Health professionals regularly communicated among themselves about the solutions they adopted, and it was not uncommon for part of the health facilities' and wards' informal revenues to be passed up through the hierarchy to higher ranks, who left these informal practices undisturbed, despite the laws against it. The governance thus in place reflected the prevailing systemic autopoietic drive, in spite of non-conformity with formal legal rules in place, and the protests of the international donors supporting the government. This example is based on three years of direct experience of the author while living in the country and managing a donor-funded project to strengthen primary healthcare, along with publications in the literature on informal payment in Central Asia.

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9.6 Health systems strengthening

This section reflects on the possibilities to strengthen a self-referential system with the characteristics of operational closure, self-organization, autopoiesis, and constructed by communications. In addition to the extensive theoretical discussions in Chapter 6, this example focuses on the article by J. Goldberg and M. Bryant (2012). This article was picked up among many others for the opportunity to discuss two important notions in heath development aid, country ownership and capacity building. As stated by the title of the article, "Country Ownership and Capacity Building: The Next Buzzwords in Health Systems Strengthening or a Truly New Approach to Development?", it tries to figure out how these strategic orientations can deliver strengthened health systems. The terms "country ownership" had come to prominence after high-profile meetings of aid donors sponsoring health systems development in developing countries. The Paris Declaration on Aid Effectiveness (2005) was a watershed, after which country ownership firmly entered the development aid discourse of most donors and international agencies. "Country ownership" implied a change in donors' postures and actions, and predominantly the determination to use country mechanisms for implementing aid projects, using their finance structures, their political decision-making as well as public sector managerial institutions. In this sense, the term comes close to acknowledgement of the concept of autopoiesis, understood as systems' production of the means for their own reproduction. However, the two notions are not equivalent and differ in many respects. The crucial difference is that there is no alternative to autopoiesis, which implies that only the system can take care of itself, while "country ownership" still suggests that something can be or was different before the agenda was established, or, in other words, the health systems of the developing country did not own all its programmes. As matter of fact, aid was (and may still is) often channelled directly to some types of provision of care without the involvement or even awareness of the governments. By the time of the Paris declaration, it became clear that such uncoordinated ways of supporting developing countries were wasteful and ineffective. For example, Ministries of Health were losing qualified staff and competences for donor projects, becoming therefore less able to run their own organizations. Regardless of these acute shortcomings, though, the autopoiesis of public health organizations and of health as a function system did not stop. We will come back to this point. "Capacity building" is the provision of training and working conditions for the health workforce in managerial, service delivery

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or any other position. Although initially carried out independently, "capacity building", as advocated by the authors of the article, should enhance competences to increase the possibility of "country ownership"; this is how the two terms connect. Without improved competences, it is implied, "country ownership" will not happen. On the other hand, "capacity building" is a field of initiatives where "country ownership" can be exercised and made operational; "country owned capacity building" should be the new paradigm, the authors propose.

Using the Social Systems Theory concept of complexity, "country ownership" and "capacity building" orient donors' supports towards making public systems of aid-recipient countries able to deal with the complexities of running larger and more diverse initiatives; the countries would be expected to reach the stage where they could run new initiatives by their own means. In line with the notion of autopoiesis of the Social Systems Theory, this enhancement of capacity to deal with increased complexities fairly translates the notion of systems strengthening. However, autopoiesis implies that the system is the only one that can decide about itself. This theoretical perspective pushes further the notion of country ownership, beyond what development aid assumes. Autopoiesis means that the existing systems have always been the owners of what they do. Before the Paris declaration donors carried out their business as they wanted, and the public system tolerated, accepted and incorporated lack of coordination into their own strategies, even if not explicitly stated. Eventually donors realized they were not achieving much by doing the work themselves, and also understood that real development would require operations to be performed by the governments themselves. That indeed increased the awareness about government capabilities. However, as consideration of autopoiesis highlights, an autopoietic system would only advance by its own self-reproductive capabilities. Funds can come from abroad, but the communications the systems sustain can only be reproduced by the systems' mechanisms. Governments were only interested in taking responsibility up to the point they saw the advantages and considered they had the ability to do so. They would not overtax themselves with tasks beyond their capacities and above the level of effort they could deploy. By being able to conduct self-observation, self-referential systems (including here health and political systems and their organizations) have identities regarding what they are and what they can and want to do (or not) – this is how self-organization is possible. In short, autopoiesis and self-reference were and are constantly at work, although donors were not paying attention and often felt

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frustrated with lack of success or willingness of the governments to follow what donors thought they could and should have done. Lack of understanding of autopoiesis was and still is a problem for the whole development aid enterprise. Some progress has been achieved though, as donors started to adopt the principle of "government in the driving seat", and developed trust and reliance on aid modalities such as budget support, by which money was transferred to the country's treasury without being earmarked for specific projects, and the government would only subscribe to jointly agreed sets of indicators, targets and reporting mechanisms; everything else, including operational decisions and implementation, was in the government's hands. This is indeed more in line with what Social System Theory would recommend. But one should not lose focus on the operational closures, by which both government institutions and donors' organizations communicate internally about observations that each independently performs using the semantics that are relevant for each one's self-references. This may still create gaps in communication between the organizations that are difficult to bridge.

9.7 Mother and child health (MCH)

The author was involved with the implementation of a donor's support to a MCH programme in Guinea Bissau, where a package of benefits for health workers and pregnant women was introduced (the work was communicated in several internal consultancy reports). The package intended to terminate the user fees charged to pregnant women during antenatal care and at delivery. It was expected that health workers would be compensated for the payments they would no longer receive from the patients, and the pregnant women would be motivated to demand care as consultations, medicines and maternity care would be free of charge. The expected outcome was a reduction in maternal and infant mortality, of which Guinea-Bissau had one of the highest rates in the world. In social systems terms, the changes would imply the introduction of a new range of communication styles and semantics. The communications between health workers and patients and health workers among themselves would have to reflect the new set-up, where charging patients would not be acceptable. Such change in communication patterns and continuous provision of information to professionals and beneficiaries on the new arrangements would have to be achieved and maintained. In short, the programme introducing the new benefit package had also to be accompanied by information and

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communication strategies to ensure the new meanings circulated and were understood by all concerned. Nevertheless, there was not much attention to the communications, and the dissemination of information about the new benefits was not systematically conducted and/or evaluated. Even where and when efforts in that regard were spent, professionals and patients were used to status quo that had existed for decades, and scepticism over the continuity and sustainability of the new initiative was prevalent. We would say that patterns of communication, as well as the conditions they correspond to, are resilient (negative resilience perhaps), and the organizations and entities involved in changing them need to strategically approach the communication theme.

9.8 The fallacy of embedding research

The chapter by J. Olivier et al. (2017) advocates that health systems research should be embedded in the systems studied. This is presented as an approach, not a research method. Without getting into discussion of the previous contributions on matters of imbeddedness in the fields of sociological and anthropological methods from decades ago, our concern here is directed towards the understanding of systems that the approach overlooks. The authors optimistically say that the nearness of researchers and the system they study has advantages of more direct access to key components of the system; moreover, that makes the implementation of the study's conclusions more likely. On the other hand, the authors warn about hiccups, as the same closeness may have the disadvantage of restricting the researchers' critical views and freedom for making recommendations. In the discussion of this study our arguments highlight first that the recommended approach is a generic quasi-normative guideline for many studies in social science and public health, and it does not carry with it any specific view of what a system, or a health system, for that matter, is. We highlight the importance of having a better understanding of how systems are capable of self-reference and self-organization. Systems can carry out self-observations and make decisions for self-reproduction while preserving operational closure. Organizations, as a type of system, distinguish between members and non-members on the basis of their entitlement, respectively, to participate in decisions or not. In line with operational closure, external researchers, i.e. non-members of the organization they study, are therefore not incorporated into decision-making communications. Provision of advice, which can later be (or not) the object of consideration in decision-making

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circles, is the most an external observer can do. The closure is of vital importance for the survival of any organization. Yet an internal researcher, if speaking from a member's position, can be dealt with as such by the organization, which will recognize the position from which the researcher communicates. But the researcher will have to adjust communications to the semantics and channels used by the organization and their position in it. Still, being an internal researcher does not per se guarantee acceptance of the findings, even when communicated in the semantics the organization recognizes and accepts. In addition, embedding research needs to be considered in reference to social systems differentiation – for instance, health and science. An individual whose main engagement is with organizations of one of these systems is not recognized by organizations of the other system as a member with the same entitlement to communications. A scientist will communicate in terms that, although fully understandable in the context of the science system, are not entirely understood or considered relevant for those who do not belong to that system. In conclusion, the insertion of any communication in the decision-making of an organization (as a system) has to happen according to the terms and criteria the organization sets. The unawareness of this aspect leads to the creation of false expectations. Embedding therefore cannot be a guarantor of unbiased unrestricted access to information and acceptance of research conclusions by the studied system. Although it can be recommended from an ethical (quasi-normative) perspective, it still cannot assure good understanding of a system's operations and accomplishments. As a matter of cautious, modest awareness, it is better to acknowledge that the system knows and can better understand what and why it does what it does than the external researchers trying to understand it.

9.9 Voucher schemes in Tanzania and Ghana

The discussions about the article mentioned below in this example are drawn in reference to the concepts of systems' internal and external differentiation according to the Social System Theory. The article presents historical narratives of the implementation of insecticide-treated bed nets (ITN) programmes as part of the strategies for fighting malaria in Tanzania and Ghana (de Savigny et al. 2012):

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> In Tanzania, vouchers have moved beyond the planning agenda, had policies and programmes formulated, been sustained in implementation at national scale for many years and have become as of 2012 the main and only publicly supported continuous delivery system for ITNs. In Ghana national-scale implementation of vouchers never progressed beyond consideration on the agenda and piloting towards formulation of policy; and the approach was replaced by mass distribution campaigns with less dependency on or integration with the health system. By 2011, Ghana entered a phase with no publicly supported continuous delivery system for ITNs. (p. 1)

If analysed from the social system perspective, the voucher schemes were not entirely part of the health systems. They were to a large extent part of the economic system, with communications and closely related economic transactions, and with the public health sub-system having some oversight and concerns related to disease risk prevention. Communications regarding the voucher schemes are not based on the health/sick code. Their associated communications represent communication with the code distinction paying/not paying for the voucher and adjusted discounted price. Once classified as pregnant and therefore entitled to the voucher, a woman would leave the health system and enter the economic system, even with the vouchers being provided inside the health facility. So, analysis of the progress of the scheme have to treat it as belonging to the economic system and related to the autopoiesis of the economic organizations involved, not the health organizations. The history of the start and subsequent development stages of the two schemes is a narrative of how the public sector came together with private partners and donors in a coupling initiative. Their economic interests and visions in the two schemes were different, which may help to understand to some extent the relatively different successes. The article would sit well as a study of public sector management and the context and results of strategic decisions. Still, it would not be dealing with health systems prerogatives of communications. Therefore, this article can be thought of as being alongside the political system and/or the economic system, with some couplings (as mothers were given vouchers in health centres) with the health system. To present a public health system perspective, it would be necessary to address issues of health risks and include health outcomes indicators, assessing the success or failure of the schemes in epidemiological terms. According to Social Systems Theory, the economic system is made up of communications that are coded as payments/non-payments. Once a payment is made, as controversial as this may sound, the

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consequences that follow from the acquisition of the goods or services would no longer belong to the economic system. Communications on whether the bed nets were taken home and placed as recommended, and whether people slept under them, and so on, to ensure the preventive effectiveness of the net, would be matters for communication within the public health sub-system, assessing disease risks and the results of health programmes.

9.10 Community health workers (CHW)

The discussion in this section focuses on a paper by K. Scott, A. George and R. Ved (2019) that reports on a review of 122 articles published in India about CHW programmes. The paper sets up a framework for assessing CHW from several perspectives, including the connections between CHW programmes and the health system. The paper classified the reviewed articles according to the CHW topic they focused on and according to the relevant contents for assessments of CHW in the public health system context, in line with the proposed framework. Therefore, the paper has a wealth of insights on the operations of CHW programmes, and also reveals notions of the health system in the background, informing the review. The purpose of this section is to show that the assessment of CHW would be stronger if it was informed by an understanding of how CHW operate from the Social Systems Theory point of view, considering how CHW are placed in the central communications, self-reference and self-organizing functions of health systems.

From a Social Systems Theory perspective, CHW are viewed according to the following 15 points:

1. CHW programmes are part of the public health sub-system of a health system.
2. These programmes therefore should be seen as observed by that system as part of itself (self-observation), contributing therefore to the autopoiesis of both the health system as a whole and public health as a sub-system.
3. Communications among the CHWs and between CHWs and other members of the public health sub-system and health service provision sub-system happen inside the health system, and are valued, controlled, directed, observed, etc. as inherent to the reproduction of the public health sub-system.

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4. The communities the CHWs serve are part of the environment of the public health sub-system; they are not members of the system, but are outside it.
5. In consequence of 4, the public health sub-system may need to enter into some sort of coupling with the communities to create and sustain conditions for programme implementation. Communities that set up some level of organization are potentially in a better position to enter into coupling. This leads to the drawing of a distinction between organized communities and communities of people living in the same space but without any organizational links between them.
6. For each of those roughly speaking two types of communities, the coupling will have to be different. We focus now on the organized ones.
7. An organized community does have internal observers and does observe itself pursuing its own autopoiesis. It uses the mechanisms of decisions as the basis of its communications. It makes decisions concerning its expectations about the CHW and the public health sub-system. Decisions lead to subsequent decisions and so on, reproducing the organization's expectations and observations of CHW and related communications.
8. The decisions, effective or not, followed or not, are in any case relevant for the continued decisions to be made about the presence, work, capabilities of and collaboration with the CHW.
9. These decisions are prerogatives of the organized community and are seen by itself as key to the autopoiesis of the organization they maintain.
10. The coupling of the community with the public health subsystem has also considerations related to the political system and its approaches to the community. The community, for example, may use opportunities brought about by elections to advance its objectives.
11. The observers in the public health subsystem and the observers in the communities see the CHW differently; they understand differently the relevance and capabilities of the CHW. They develop different expectations, and these expectations may be fulfilled or disappointed for different reasons, judged according to different standards of values and performance judgement criteria.
12. The narrative created by the public health sub-system to describe a successful (or failed) programme might differ largely from the narrative the community may create about the success or failure of the same programme. Furthermore, academic narratives with scientific observations and analysis of the programmes also differ from both the community's and public health sub-system's narratives.

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13. The construction of the narratives uses the respective codes relevant for the respective systems, organizations and sub-systems involved. The public health sub-system uses the health-risk/non-health-risk codes with epidemiological and service provision indicators. This sub-system ultimately wants to know whether perceived health risks have been addressed by the programmes and somehow reduced. The observations have to be communicated inside the sub-system itself and then outside it to the concerned healthcare service provision sub-system (where appropriate), and, furthermore, to the political system when possible and necessary.
14. The community itself is not a system; it does not have a specific code to elaborate its communications. However, where the community establishes a representative organization, the organization communicates inside itself in accordance with membership and decision-making. Decisions are taken with the drawn distinctions used for making the respective observations. The organized community selects its distinctions based on its repertoire of distinctions it regularly uses. In that way, the organized community is able to say whether the CHWs have fulfilled completely, partially or none of the expectations.
15. The public health sub-system and the organized community may disagree radically on the way they assess the results of the CHW's activities. But they may also use references that have similar meanings for both.

By conducting an assessment of CHW programmes along these lines, a more precise perspective of community/CHW relations and possible outcomes as well as their relation with the public health sub-system can be achieved. This orientation can be summarized in the following list of guiding questions:

A) Where and who are the observers (Inside communities? Among CHW? In the public health subsystem? In the healthcare service provision subsystem? In the academic/scientific system?).
B) Are we dealing with autopoietic systems, sub-systems or organizations?
C) If yes, what is the basis of their autopoiesis?
D) Is the assessment of the programmes part of the self-observation of the sub-system and organization involved?
E) Are the communications of self-observations being incorporated into decision-making and/or interlacing with subsequent communication operations in the sub-systems and organizations involved?
F) Are CHW communications themselves being observed and assessed?

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G) Is there more than one system involved in the observations (organization, sub-system or system)?
H) Have the sub-systems and organizations involved entered into structural coupling?
I) What are the codes of communication employed internally by each sub-system and/or organization involved?
J) Does the structural coupling involve communications between sub-systems and organizations?
K) On what basis do the coupled sub-systems and organizations communicate with each other? Are the codes common and share similar meanings? Or are they different?

For the content review of the 122 selected publications, the article proposed a framework with several areas of CHW programs observation: inputs, outcomes, impact, governance, interface with communities, social profile of CHW and health service context. In relation to health systems, the article classified the publications according to:

> We considered an article to have taken a health systems perspective if it examined health systems elements, such as supervision, training, supply chain management, financing, motivation, etc., or if the article discussed linkages or repercussions between health systems dimensions such as how communities supported ASHAs or whether facility providers were responsive to ASHAs. (p. 3)[1]

This shows the difficulty in approaching health systems without a firm reference of what a system is. The approaches resort to managerial (supply chain management, financing), operational (supervision), organizational (training, motivation), structural (facility providers responsibility) and functional (community support) aspects that do not necessarily and specifically reflect systemic features. For such endeavour, we propose that the key systems' aspects that need to be observed are: self-observation, self-reference, self-organization, operational closure, system/environment distinction, etc. as presented in previous chapters.

The authors of the paper looked for a number of aspects of CHW/health systems interface in the reviewed articles, which they say were rarely discussed. These were:

1 Accredited Social Health Activist (ASHA).

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> In particular, there was little consideration of programme governance (programme oversight and guidance, CHW political support, the role of NGO actors in CHW policy, grievance redressal for CHWs, programme financing, and CHW programme reporting), community voice, community engagement in ASHA selection, and community collaboration with ASHAs through health committees (p. 12).

In addition, they say that more research is required to truly understand the programme as an "integrated member of the health system". These observations suggest the reviewers had expectations about the programme's autonomy and self-reliance set at a higher level than seen in a public health sub-system programme among many others.

There were also expectations that the programmes would fulfil roles and achieve results wider in scope and beyond what the programme could deliver. It seems that, in the review, expectations configured objectives that were superimposed on the actual responsibilities and directionality of the CHW as a public health programme. For example: "research on other aspects of the CHW–health system framework will be increasingly important to the programme's capacity to adapt, sustain and achieve its broader goals around *empowerment, community engagement and change across the social determinants of health*" (p. 12).

These purposes can be the subject of controversies, and interpreted as political and/or ideological discourses motivated by the intention to capture or use the programmes according to the wishes of specific agendas, independently from the services delivered on the ground by those programmes. Additionally, "on-going research is required … on realizing the *ASHA role as a community change agent, and on the influence of health system decentralization, social accountability and governance*." (p. 12)

From a critical view informed by the Social System Theory, the survival and maintenance of the programme based on the communications it can sustain in its daily operations is a matter of the public health sub-system's reproduction, in other words, its reason for existence. "Community change", "empowerment", "decentralization" and "social accountability" are examples of the semantics of political intentions detached from the operational (health service delivery field support, disease prevention and outreach) aspects and justifications of the programme as a public health programme. The identity of the public health sub-system is at stake in the programmes it defines and implements.

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It might be appropriate to point out that the position of the observer needs to be considered. An observer from the academic world has concerns and communicates in channels of the science system where that observer is inserted. The academic articles communicate differently from the way the CHW would communicate among themselves on operational matters, and how the CHW would communicate with the communities and the public health sub-system to which they belong. These differences in the setting where the communications take place lead to narratives that are only understandable or meaningful inside the system where those communications take place or where coupling between the systems is possible.

9.11 Health policy analysis

This section deals with the differentiation between health systems and political systems and policies as written communications. Widely used analytical frameworks address health policies without considering the systemic features of the political and the health systems. Here we cannot give a full account of those frameworks; we give a brief overview of the topic from the Social Systems Theory perspective, considering that the political and health systems are communication-based self-referred, operationally closed systems.

Policies are indeed enacted by the political system, as the maker of *collectively binding* decisions, to be implemented by the other function systems, including the health system. Policies can also be enacted by the health system according to its self-organizing functions. Policies are written communications to orient, set the information scope and channels of communication that implement the policies. Policies that are not thus translated have no real consequences and are irrelevant; therefore policy communications have to be executed as continuous unfolding communications among those concerned.

The political pressures to enact policies may at some point activate the political system. Once activated, the political system discusses, makes decisions, closes the matter, and moves on to other pressing issues, leaving the implementation to the respective systems.[2]

2 There is an enormous literature conceptualizing how issues get political attention and go through a decision-making process to eventual policy enactments by a political system. According to Luhmann, the political system is essentially concerned with its own legitimacy, to be continuously confirmed in the decisions it takes. There is

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The daily functioning routines of the health systems do not mobilize much interest in the political sphere. Political analysis therefore has to account for the intermittence of political attention, as far as the making of *collectively binding* decisions is at stake, while the life of the health system and its organizations progress at their own pace, determined by their capacities of self-reference and self-reproduction (reproduction of its communications).

On the other hand, health systems and health organizations closely monitor and manage the implementation of the approved policies. It is important to keep in perspective that health policies are intended to have effects in health systems whose largest proportion of resources is continuously dedicated to healthcare services provision with strong inertia and therefore little room for changing established practices. In other words, policies arise in contexts where what is already in place cannot easily change. Rather than having a "blank sheet of paper", health policy-making may have to content itself with "scribbling at the margins", so to speak, narrowing down the ambitions to specific limited programme targets.

Furthermore, as both the political and health systems are based on communications, any change in policies, whether initiated by the health system or by the political system, requires communications that can go back and forth and eventually may become policy texts. The success or failure of policy initiatives may rest on the possibility of eliciting and sustaining such communications.

The article by S. Dalglish et al. (2018), discussing medical power in two case studies of health policymaking in India (on medical specialization) and Niger (on child survival), brings interesting materials for reflections. The authors describe how medical groups, although small and fragmented, exercised policy-making determinant influences by dominating discussions in consultations and conferences and with access to regulatory institutes and committees.

In correspondence to that, the Social Systems Theory would advise researchers to observe the communications and presence/absence of competing

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a plethora of concepts focusing on structural aspects, diverse range of variables and multiple dynamics trying to give an account of how policies are shaped. However, for the discussion here, the focus is on the theoretical structure by which political decisions taken by the political system become part of the life of the health system and its organizations, as distinct systems differentiated from the political system. We therefore do not delve into the huge contingencies and complexities of policy-making and rather try to fix attention on essential functional and structural aspects of the links between the two systems.

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communications that could carry different meanings, presenting self-observations of the system in perhaps convincing terms inside the systems. What needs to be understood are the occurrences of communications and the complexities and specificities involved. Organizations (professional organizations included) that establish communications with other organizations are able to achieve coordination in these processes.

Intentions or interests that are not communicated do not acquire systemic consistency and therefore do not stabilize as communications the systems can recognize. The presumption of power as a position that grants strength and domination to the respective occupiers may distort the observation of policy-making. Communications and power as a communication medium need to be better understood, and power cannot do the work that communication doesn't. The power topic is further discussed in the annex.

The article by G. Walt et al. (2008) presented a picture of the state of affairs of health policy analysis in the international academic literature at the time it was written. Commenting on observations made in reviews of papers on the subject, the authors pointedly indicated that "the main question is often 'what happened', to the neglect of 'what explains what happened" (Walt et al. 2008, p. 309). This, according to the authors, reflected the lack of or limited use of theoretical frameworks. Theories and frameworks were mainly descriptive rather than explanatory.

From our perspective, the excessive use and dissemination of insufficient frameworks is also responsible for delaying the actual reflection work that needs to be done, putting health policy analysis on firmer theoretical ground. We therefore argue that Luhmann's Social Systems Theory has the elements to reconfigure the debate.

To discuss policy from a Social Systems Theory perspective, we can start with the definition of health policy as adopted in the mentioned article: "It can be useful to think of health policy as embracing 'courses of action (and inaction) that affect the set of institutions, organizations, services and funding arrangements of the health system'" (quoted from Buse et al. 2005, p. 6). Luhmann is emphatic in signalling that *action* does not have the capacity to develop social systems; actions do not require the interlacing with further actions and are thus "weak carriers of meanings".[3]

3 "Weak carriers of meaning" is our attempt to put in a few words Luhmann's views expressed for instance in the following words (our translation from Spanish): "a social order is more integrated at the level of attribution of motives than at the

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In contrast, communication fulfils all requirements to build social life. Essentially communication requires the enlacement of understandings, linking a communication with past and subsequent ones, permitting the recursive confirmation (or not) of the correct (or not) reception of a communicated meaning. Communication always keeps open the possibility of a "yes" or "no", and therefore is contingent and offers the possibility of selections on both communicating sides.

In comparison, action does not offer a complex enough mean for the development of social life. An action without communication lacks meaning. Only communication can create social life and society. The meaning of an action needs to be communicated to acquire social relevance.

Based on that, we can say that policies are written communications to orient actions and, above all, guide communications, setting information scopes and channels for them. A policy document should be seen as a system communicating and organizing itself. It entails self-references and self-organizing guidance; in other words, it sets the definitions for communications that will then implement the original policy. Policies that are not translated into systems' communicative operations have no real consequences and are thus irrelevant. Illustrating that, policies bring orientations for a system's internal communications on how it should observe and communicate about the policy itself, i.e. the monitoring and evaluation mechanisms.

Policies can originate in the political system as well as in the health system. Once enacted by the political system or by the organizations of the health system (within their scope), and subsequently made operational, a policy becomes integrated into the internal communications of the health system. In that, while becoming operational, the police acquire diverse and often unforeseen complexities that the system will need to deal with. The complexities emerging in the implementation of a policy can go beyond what the policy expected and predicted. The self-observation of the system might identify the excesses of complexities that should be solved. Complexities do not necessarily have unavoidable good or bad meanings; they just arise out of the system/environment relations.

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level of action itself. Thus, the understanding of motives retrospectively helps to recognize whether an action has occurred" (Luhmann 2005, p. 30). We can add that construction and attribution of motives and objectives can only be made through narrative, i.e. communications, not actions.

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The Social System Theory has profound implications for observing health policies, and the genesis of policies in the context of the coupling of two differentiated social systems: the health and the political system. At high level, health policies are, in Luhmann's terms, *collectively binding* decisions taken by the political system to be implemented by the health system and its organizations, which implement them in correspondence to their self-organizing functionalities.

Policies can also be enacted by the public health systems (setting up programmes, for example) or by health organizations (organizing internal services in large complexes of inpatient and outpatient care, for example); these are communications of internal decisions that subsequently have to be executed via communications among those concerned. Regardless of the origin, enacted policies are expected to have effects in health systems' communications.[4]

Policies only become effective when their guidance is communicatively incorporated into the life of the system, and therefore can become part of the system's self-reference and self-reproduction. Only the health system can do the translation of policies' ordinances for itself; such prerogative cannot be delegated or transferred to any external systems.

9.12 Epidemic outbreak

To illustrate how the health system deals with environmental complexities and is then affected by that, we use an example of a simulation of an outbreak of SARS. This example explains that while dealing with complexities the system becomes more complex in the process. In particular, the example also helps to understand the distinction between the system that responds to the outbreak and the outbreak itself. Outbreaks or endemics or epidemics are often mistakenly called systems in modelling and simulation exercises, however they are not systems according to the Social Systems Theory. Outbreaks do not pursue autopoiesis, do not show operational closure and do not use communication as building blocks. Transmission of infectious diseases cannot be understood

4 Luhmann's theory about political systems is rich in concepts and cannot be thoroughly explained here. A section in the Annex gives brief explanations about it. For the discussion at this point, it is relevant to signal the theoretical structure by which political decisions taken by the political system become part of the life of the health system and its organizations.

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as communications (of meanings) in the sense defined in the Social Systems Theory.

The relevant paper was written by K. Wyss and J. Costa (2003) for the Swiss Federal Office of Public Health, simulating scenarios of a possible outbreak of SARS in Switzerland, considering the impact of possible measures the system could implement. The network of factors and expected health interventions were comprehensively mapped and used for building a stochastic model of the epidemic profile. The modelling allowed the complexity of the outbreak to be taken into account, with its inherent uncertainties, as well as the complexities of the diverse sets of interventions the health system could select from and implement with varied unpredictable rates of successes.

The factors determining the appearance and spread of the disease, considered as environmental factors in the Social System Theory terminology, were addressed as similar to indicators observed in other epidemics. They considered the indicators: arrival of a number of infected individuals; distribution of susceptible population; local transmission by the first cases; incubation period before the onset of the outbreak; population density and distribution of contacts with infected individuals; transmission period; attack rate; case fatality rate; reproductive number R; population and population age and density. Obviously, not all those indicators were included in the models.

On the other side, once the outbreak is detected, the health system would be expected to put in place a number of measures that would include: case detection; contact tracing; quarantine; preventive measures to avoid transmission; isolation of patients; proper disposal of bodies; training of professionals; communication campaigns; acquisition of new drugs and equipment; statistical monitoring; management of responses; and so on. We saw all of that going on in the recent Covid pandemic. The response measures are essentially expected to reduce the rhythm of transmission, disrupting the course of the outbreak. However, the rates of success of each measure and their combined effect are also uncertain and can only be tentatively incorporated in the model as probability functions and intervals.

Based on this rich panorama of factors and interventions, the behaviour of a health system facing an outbreak can be predicted as follows. The health system first recognizes the occurrence of a disease and a possible outbreak in its environment. The system acknowledges that the outbreak is a matter the system has the responsibility to communicate and do something about, and in consequence of that, mobilizes the sets of communications to internally report the events and formulate the decisions to be taken.

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There are internal expectations and ready-made (comprehensive or partial) communications to be uttered on specific themes related to risks, contention, monitoring, treatments, etc. elaborated in correspondence to the system's self-produced narratives for explanations and actions related to outbreaks. In a few words, the health system detects the interferences in its domain, makes them the subject of its own concerns, and deploys the relevant communications.

Different health systems may differ in relation to the capacity to identify an outbreak and the type, rapidity, intensity, extension, etc. of their response. The differences might be linked to relevant internal characteristics of the system and its self-defined ways of tackling outbreaks, as the system understands it. Once a system sets its response in motion, a chain of recurrent communications are then recurrently reproduced and maintained. The outbreak then becomes what the system and those working alongside it say about it.

The health system has to construct an internal narrative explaining (to itself in the first instance) what the outbreak is about and the peculiar characteristics to be tackled by measures the system will then put in place. The system needs to take account of all the fields of intervention where it will need to deploy its resources. It goes through a process of internal differentiation with new sets of communications and respective operations and addressees (the locus of new responsibilities) becoming functional.

The scenario can be depicted as follows. Sections of the health system will be handling treatment guidelines and isolation rules to treat the sick. Some divisions will deal with social communication and communication to professionals inside and outside the system. Other sections will take care of the logistics of tracing contacts and assuring they will be properly quarantined for the necessary time. Others still will be dealing with the monitoring and statistics of the outbreak. Other actors will carry out procurement of emergency materials, medicines and all that is required to treat patients, quarantine contacts, as well as deliver prophylaxis. Still, another team will carry out political and decision-making activities, exchanging communications with other systems to be made aware of the outbreak and perform activities within their scope of competences. Each of the created divisions and sections will need to put in motion their own rules of functioning and engagement.

In short, the overall mobilization shows the health system becoming more complex, generating a range of additional internal communication with new semantics. If the system is for the first time dealing with a large outbreak, after it subsides the system will display features that it did not have previously. It will acquire operational competences and the knowledge/communications re-

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quired to deploy those competences. The complexity of the epidemic will have been translated into control measures, increasing the complexity of the health system, and having long-lasting effects.

In Luhmann's words: "Only complexity can reduce complexity" (Luhmann 1995, p. 26). Only the complexity of the system can reduce the complexity of the environment. The restructuring of competences and responsibilities taking place inside the health system is how the complexity of an outbreak is tackled. The aim should not be to reduce environmental complexity or to turn it into simplicity; this would not be possible. Instead, the system should "embrace" complexity, so to speak. A more complex division of labour, new communication channels, revised assignment of responsibilities, reviewed distribution of resources and skills are, for example, aspects that might change irreversibly once the autopoiesis of the health system leads it to another level of response.

Acknowledging that by tackling an outbreak a health system will become more complex, and will change the sets and conditions of the communications it sustains, should have significant bearing on devising the strategies the system needs to adopt. This understanding also raises important considerations for any initiative aiming at strengthening health systems.

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