The Role of Complexity Dynamics in the Innovation Process within the new Primary-Care Governance Model in Portugal

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Abstract

The USF (family health unit) is a new type of healthcare unit defined by the Ministry of Health to enhance access to primary-care while improving efficiencies. USF governance model is based on more adequate public management methods and it introduces new practices of collaboration associated with "self-organization" environments. In this paper we explore the complexity theory concepts and applications to address the challenge of primary care networks deployment. To know how to deal with diversity and uncertainty in daily work and to acknowledge that ideas that emerge from daily problem-solving can actually contribute towards innovation and quality improvement processes. The theoretical framework is introduced and the USF model is analyzed.

Keywords: Health, primary-care, innovation, governance models, complexity, self-organization

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Introduction

In terms of health care, Porter and Teisberg (2006: 6) appropriately emphasize the delivery of care ahead of the issues of insurance, consumer choice, employer purchasing, and government regulations. Of course, the latter are important, but it is on the provider's side that the issue of the quality of service including customer satisfaction either take place or not. Organizational issues like teamwork, collaboration and innovation processes represents the glue that allow for better performance and accordingly better care (Devillard, 2001: 154). But exactly which governance model will allow for the kind of collaboration for innovation that enables better organizational performance?

Linstone (1997: 1) put the issue this way: "…we are approaching the new era with 21st century technologies, 20th century governance processes, and 19th century governance structures…"In healthcare we often have non-communicating specialties, fragmented care, fragmented provider entities, little or no output measurements, primitive cost accounting, and outdated information technology. No wonder quality is uneven and costs are high and rising (Deloitte, 2004: 37).

Yet, the main healthcare management concerns today still center around access balance and cost containment (Rosenau, 2008: 240). These have been such intractable problems that they still dominate the policy debate. Universal access is still an issue in many countries, but is essential for both equity and efficiency. If reform fixes the access problem but leaves the delivery system unchanged, payments systems combined with an aging population will mean costs will grow uncontrollably. One significant statistic (OECD, 2006: 5) claims health expenditures in 2020 to be near 20% of GDP in many western countries. Incremental improvements will not be enough -- dramatic improvements are required!

But how could one fix anything as complicated as health care delivery? Berwick et al. (2003: 9) reminded that "getting from here to there" is really the hard work. Indeed, expecting a governmental "big bang" to fix these problems would be naïve. Nevertheless, markets can deliver astonishing improvements in quality and efficiency when competition operates (i.e., agents acting locally) on the right things under the right regulatory control (i.e., the simple rules of complex adaptive systems). It is important to enable a certain level of competition and regulation to achieve better health results (Rosenau, 2008: 241). This means innovative ways of delivery and managing care to allow for sustainable improvements of professional performance and customer satisfaction. Indeed, trends indicate that the role of patients' will only increase (Smith, 1997:1).

The system needs a degree of innovation that allows fitting real patient needs with improved ways of serving them over the full cycle of care. This suggests a change of organization from traditional medical specialties to a more patient-centric approach that necessitates a more flexible re-organization of healthcare delivery.

Primary-care Reform and the New Governance Model

What's needed is a "new public administration" capable to cope with a more dynamic society and a more uncertain environment. Many call this trend the "New Public Management" (Pollitt & Bouckaert, 2000:11). It requires a wide application of innovative management to establish new conditions that would engage young and highly qualified professionals into a new relationship with citizens by creating appropriate information

systems (IS), alert systems, "public-action-coordination" systems, promotion and awareness campaigns, competencies development programs, and so forth.

Reform in primary-care is undergoing strong debate in Europe (Farmer & Chesson, 2001: 267). In the UK most General Practitioners (GP) have already decided to be under a contract-program (Campbell et al., 2007: 1121). The European Health Observatory suggests more flexible frameworks: most healthcare management training programs and textbooks focus on only one or two models or conceptual frameworks, but the increasing complexity of healthcare organizations and their environments worldwide means that a broader perspective is needed: an innovative model that includes clinical governance and quality management. Trisolini (2004: 309) has shown potential for enabling improvements in quality and cost, but assures that it is not an easy process.

Primary-Care Reform in Portugal

The MCSP (in Portuguese, "Missão para os Cuidados de Saúde Primários") is a task-force created by the Portuguese Government in 2005 to address the primary-care reform. MCSP is encouraging results' measurement at the delivery points to improve the impact of outcomes' perception. Enthoven (2003) believes that integration of health plans and delivery systems can ultimately be more effective than multi-specialty practices organized around the patient for each medical condition. There is plenty of room, however, for competing practice models to prove their value. With this this in mind, MCSP decided to develop a new governance model to tackle primary-care delivery problems.

Primary-care in Portugal has experienced very significant steps since its beginning in 1971 when a task-force for integration of child-care by spreading out primary-care centers (PHC) was initiated. This was a quite innovative move, considering that the main conference behind such reform was held in Alma-Ata only in 1978 (WHO, 1978: 2). In 1982 the career for medical GP's was definitely clarified bringing many new professionals into primary-care. Legislation in 1988-89 permitted the development of several PHC pilot experiences such as the "third-generation" PHC.

USF Governance Model

USF is a small, family health multi-professional unit depending on the PHC from which it emerged, with functional and technical autonomy. USF serves personalized primary-care through contracted services focusing on improving access, flexibility, effectiveness, efficiency and quality. USF is structured as a flexible organization integrated within a network with other functional units. The law creating the USF in 2007 defined the portfolio of basic services. USF also aims at integrating healthcare units in a simpler and more autonomous way from the technical, functional and organizational points of view. Integration is the key to apply the reservoir of ideas coming out of the experience of many motivated professionals.

As a portfolio of basic services, the USF model varies the dimension of the population covered, the available schedule and complementary services negotiated and agreed with health authorities. The services commitment part of the model defines what must be obligatorily contracted regarding primary-care and nursing services: core clinical services; administrative secretariat; operations; patient waiting list size and training. The defined core care services are:

1. Surveillance, health promotion and disease prevention for all life phases: general, women's health; child-care; adolescent; adult; and geriatrics care.

2. Care for acute disease situations.

3. Clinical monitoring in chronic diseases and multiple pathologies situations.

4. Home care.

5. Inter-connection and network collaboration with other services, sectors and differentiation level, in a citizen perspective.

USF has an innovative working schedule in mandatorily being open all weekdays between 8 and 20 hours. This schedule could be extended according to the USF geo-demographic area, waiting list size and patient number or multi-professional team size. The size of the list of patients for the basic care services should have, at the least, 1.550 patients per physician.

Innovation and Complexity Dynamics in Primary-care Environment

A USF should be a space of learning and innovation where a continuous training culture should prevail for all professionals incorporating annual individual and collective plans with professional needs. Hamel (2006: 42) showed that innovation usually follows a power law behavior. A more innovative environment means that the organization is able to develop a higher number of ideas in order to eventually obtain several highly successful ones. The difficulty is to create a culture of innovation to tackle the many barriers to restructuring healthcare delivery, reimbursement, and so forth. The opportunity for reform is far greater today, with healthcare in crisis, than a decade ago.

The fundamental problem concerns the value of the healthcare delivered. But how could healthcare be re-organized to deliver more value? Porter and Teisberg (2006: 5) think that integrated practice is the best answer. The USF model actively entails patient-focused practice groups that will (learn how to) bring together all the professionals and delivery systems to treat an individual's clinical condition and not just the discreet incidents that result from that condition (Lapão, 2007b: 39).

Organizational Models

Each USF should decide to be in one of three levels of organizational development: A, B and C. Theses levels are related to the USF's organizational autonomy stage, payment and incentive model differentiation and financing model and its related regulation status.

- Model A: This model corresponds, in practice, to a learning level where the primary-care teams improve the way they work together to fulfill the business targets. It also represents a first contribution towards the development of the internal performance based process.

- Model B: This model is best for teams with higher organizational maturity where the teamwork is already an effective reality and they are prepared to go to a higher level of business contract.

- Model C: This level assumes the existence of a full business contract-program.

The USF application submitting process implies the creation of a multi-professional team (physicians, nurses and administrators) that have joined together voluntarily in order to focus on the management of their patients' needs, the selection of a explicit working place and a geographic location, a clear description of the business plan, forecast data for the beginning of USF activities, the name of the team leader and contacts, and a proposal for

additional services. The main objective is to reach patients that do not have a GP in order to reduce the number of citizens without a one. The professionals' payment is performance-based.

From Collaboration to Innovation

USF has a shared management model based on the delegation of competencies within the team including clinical governance responsibilities. USF are supposed to work complementary with PHC, thus allowing for synergies to take place. The new concept of USF, closer to the actual population needs, has also improved conditions that enhance the level and quality of communication with hospitals. The hospital serving the USF (or the PHC) should be prepared to respond to the population's secondary healthcare need. This could be improved with specific vertical healthcare programs that will ease the relationship with practical results.

On a (self-determined) weekly base, the USF management-team meet to examine working processes, with special attention paid to process improvement and quality. This should include clinical cases debate and clinical practice problem discussion by USF professionals (like in hospital clinical departments). Additional services portfolio should be negotiated and developed in the case of identified patient population needs and in the case of USF human and technical resources availability.

USF realization is an innovation process. For instance, Marginal's USF (near Lisbon, with around eleven thousand patients) implementation was not easy and only after many meetings was it possible to create a team of seven physicians. In order to fulfill the target objectives they collaborate to support each other in case of illness or other reasons. The motivation is also reflected in financials: in the new system, the professionals at the USF will be rewarded as a function of the number of patients attended to, considering not only the patient number, but also other indicators like "the number of consultations or exams per person". The simple software developed is critical to support the small team of professionals, besides allowing the calculation of several statistics, control vaccination and consultations, etc. Data will be collected that will further allow the team's objectives to be evaluated for payment and benchmarking.

How specifically do innovations help in this context? We have asked several GP's this question and their answers were that the only way to improve was through delegating power and technical competences to skilled professionals. This creates conditions for the emergence of new informal leaderships by demonstrating the benefits for the organization and for the people and, accordingly, it will ease the process of involving them, recognizing their merit and obtaining short-term results. To develop an innovative culture, by trying to do things right the first time, people will need to take risks and accept the possibility that mistakes will be made. This also includes giving people a voice, giving them a chance to express their ideas and comments, being available to change, enjoying the search for new solutions for new problems.

The Role of Complexity in Healthcare Innovation

Mintzberg (1979: 268) considered healthcare organizations to be the most complex ones by consisting of many different care services, different people (with different skills) doing different things, different processes requiring an architectonic and a holistic approach to systems. How can such an organization be managed? Several approaches have been proposed (Plsek & Greenhalgh, 2001; Plsek & Wilson 2001; Lapão, 2007b), all focusing on the need

for highly qualified professionals. As complex organizations, they have a number of "complexity zones" (Lapão and Tavares, 2007: 41) where professionals are required to interact in a more intense way. These risky "zones" represent opportunities to learn (or innovate) and demand people capable of solving complex problems. The management of complex organization should facilitate the arising of *self-organization* (Kauffman, 1995: 71) by bringing in highly competent people capable of solving complex problems. Self-organization in this kind of healthcare setting is brought about by interaction between professionals and patients. The new paradigm of eHealth (Lapão, 2007a: 493) indeed implies deeper cooperation and higher citizen health management responsibility.

Management should also have the capability to deal with the systems' complexity (i.e., with daily new problems to solve!). Hence, to handle complexity, managers should have specific technical and social skills allowing for innovative processes. Since self-organization takes place through obeying to a set of simple rules, as far as health government policies are concerned, the existence of an adequate regulatory body is required, following international standards, that will operate as the "simple rules" of action. Furthermore, at the operational level, it will mean that highly qualified professionals are needed to act as clever "agents" interpreting (local) complex patterns.

Health management aims at contributing towards more efficient and effective (using the resources where they seem to have larger impact) care processes, i.e., contributing for a more "intelligent" use of the resources. Complexity mostly means understanding health organizations as living systems, able (with the capability to generate strategies to) to deal with increased diversity and uncertainty through interactive (internal) mechanisms. Complex systems are open systems that allow the input of "energy" (like ideas, new situations, etc.) that feed the "agents" (in this case the healthcare professionals). They are "open" to the fact that daily business "diversity" can generate new ideas helping to improve business processes, i.e., innovation (Davenport, 2006; Fonseca, 2004)).

Therefore the innovation perspective is somewhat linked to processes improvement in a collaborative community. In this sense, we might use complexity theory to understand the way healthcare units can be seem as "complex adaptive system" (CAS). A CAS in the health environment can be characterizing as follows (Lapão, 2007b; Kauffman, 1995; Holland, 1998; Plsek and Greenhalgh, 2001):

- (Interacting) healthcare professionals usually know how to lead with paradox, i.e. they accept the diversity of perspectives about the same reality;
- Usually clinical services are self-organized, with distributed control (in different teams and agents) from which emerge the inputs for institutional rules;
- "Emergence" results from the non-linear relationships between "agents", either between physicians and patients or between interacting physicians (in consultations, in the emergency room, at the surgery room, etc.), meaning that one needs to cope with the intrinsic complex properties of human interactions;
- Healthcare professionals connection patterns are non-linear, leading to the generalization of the phenomenon of co-evolution in which each "observer" teaches and learns by interacting with the other "element" under observation.

The USF (or any clinical department) culture emerges from "making sense", i.e. from the collective search for meaning that results from the many interactions between professionals (conversations, meetings, clinical magazines, etc.). There are situations in meetings which are excellent opportunities for team building and learning from the collaborative endeavor of the daily activities of trial and error.

The complex nature of healthcare compels the development of new skills needed in the organization to cope with new problems. The physicians, nurses and managers have to cope with uncertainty. In this circumstance, professionals will quickly learn that "taking action" is key, assuming high level of standards and rigor, reluctance to simplify, and to be available to deal with the unknown. Since the principles of CAS usually mirror the reality of the interaction between physicians and patients, knowledge is continuously produced and will be probably changed in the next set of professionals' interactions. Innovation happens from the mix of experiences and from the willingness (searching for benefices and associated risks) to allow knowledge to create value, impart meaning, or improving living conditions.

Results

Since the reforms began, already 143 USF's have begun operations. MSCP (2007) estimated around 750 thousand patients without GP's. Recent numbers show that these 143 USF improved the access to a GP to over 180,000 new patients, although slightly below the expected 225 thousand (the expectations were obviously misleading). The 143-implemented USF represent an interesting result though the aim was 400 USF to respond to demand. USF are already working with performance-based payment to their physicians.

Major difficulties still exist, particularly regarding building how further adaptations can happen as well as in informatics and professional mobility (MSCP, 2007). There are cities in the interior that have not proposed any USF, meaning that probably there are geographic constraints, most likely related to the density of patients: such low patient numbers create difficulties because the extra effort won't pay-off. Having two different organizations sharing the same space (the PHC and the USF) and competing for patients is not easy and consequently conflicts between professionals were frequent in the beginning. There have been also problems regarding the delay in approving the payment incentives. But there are other positive impacts. Santa Maria da Feira's Hospital is an example of the awareness of the positive impact of the USF. Usually, many patients came to the emergency services because the PHC did not meet the demand. Now with the USF supporting the demand, less patients actually go to the hospital. For instance, Lourosa USF had an impact of approximately 25% reduction in visits to emergency reported.

The USF patients already benefit from better access to healthcare and they are manifesting their satisfaction. The improvement in results from the new organizational model may represent "a positive influence" to the PHC. The first results of implementing the USF model may be premature; nevertheless they are also very important because it may be useful for corrections or for further emphasis in specific areas.

There are essentially two main benefits to consider. The first is due to the attributed technical, functional and organizational autonomy to each USF. In fact, this kind of "simple rules" means that the Governance Model incorporates the proficiency and potential for innovation of these small units. These conditions might allow each USF to find better ways of organizing, to establish a consistent team in order to reach better solutions to improve the results. From the cases studied there was already clear and significant evidence of organizational work that better fitted both professional and citizen needs. The second is the

recognition of the "team effort" translated in both institutional and financing incentives for the A-Model, and in a new payment system, performance sensitive, for those who decide to move further into the B-Model. This means that USF framework acknowledges the professionals performance and promotes autonomy. As the B-Model adoption depends upon a contract, which is key to assure transparency throughout all the process, transparency that makes explicit the objectives and the commitments established between parts, healthcare professionals and the Ministry of Health. The physicians involved in the USF challenge are aware that the "management by objectives" is key to their success, because it helps addressing collaboration, compromises and improves responsibility.

Specific management indicators were introduced to monitor primary-care services, which is a rather innovative approach in Portugal. The contract-program operation depends on indicators that reflect both team and individual work, allowing for a deeper implementation of the "management-by-objectives" framework to compromise professionals, their accountability and motivation. If within 2 years primary-care reform stability and coherence have been made sustainable, for sure it will mean that a tipping-point was reached. But before that, one must be prepared for the reasonable tension that is being developed between the new "contract program" (with evaluation, accountability, etc.) culture and today's passive culture.

For a sustainable diffusion of the USF agenda, credible and easy to use Information Systems (IS) are needed, to effectively translate the work developed and the health gains obtained. The IS development should also consider both business and clinical functionalities. These functionalities should guaranty the interoperability and coherence of data, information, indicators and statistics (MSCP, 2005). Many mistakes have been reported, even a formal complaint (by a set of USF) regarding the introduction of malfunctioning system. Many are still spending tremendous amounts of time to deal with the accountability processes.

MSCP have released data regarding time evolution of USF numbers. Drawing the graphics, one could find interesting behavior: It seems to follow a linear or a log- normal. Usually, the diffusion of a new product (like television, or mobile phones, etc.) would follow a logistic curve (Hamel, 2006: 39). But if the USF number evolution's curve (Figure 1.) is a "log-normal" one, therefore the curve's shape shows something like a saturation of the capability to attract new participants. This could be interpreted as a limitation of the governance model. Probably the motivational incentives of the USF's governance model only reach a certain number of individuals, those ones that would accept the challenge, i.e., that will see they can cope with the risk of change required to reach a higher level of organizational benefits (expressed by the performance-based payments).

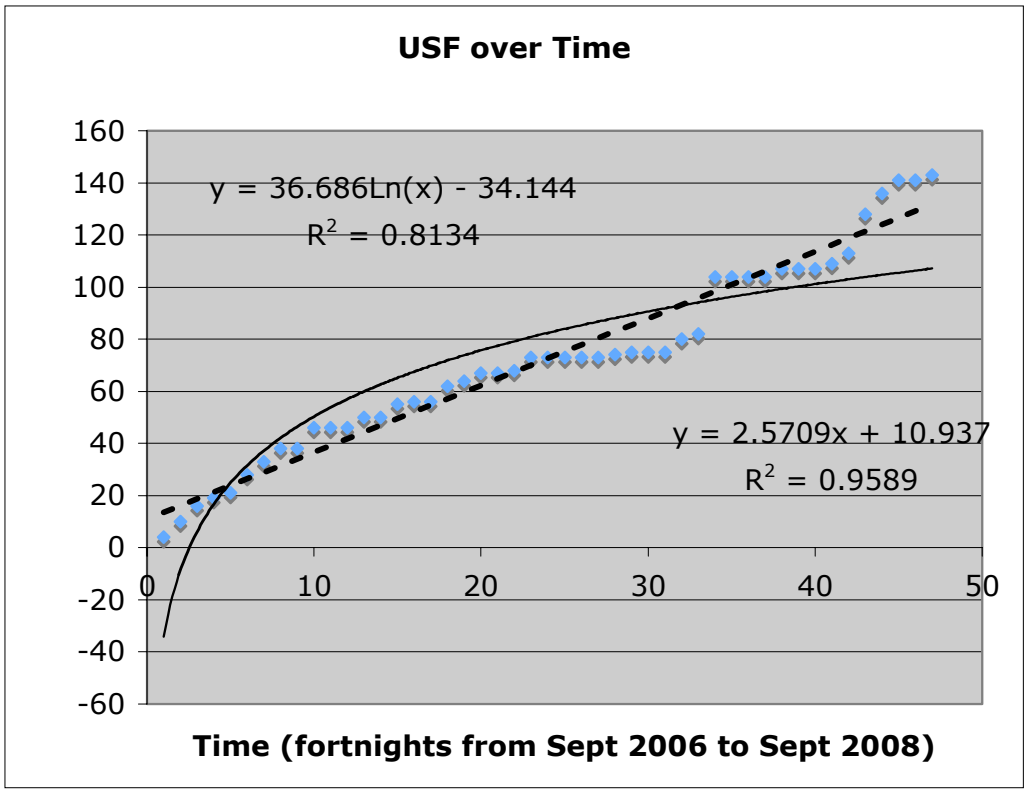

Figure 1. Timely Evolution of USF

This could be important for two reasons. First, since there is evidence that the USF framework can improve the primary-care performance one must make all efforts to increase the number of USF. Second, the USF framework is also a means to entice more young professionals to a career in primary care where they are better prepared to work in a different organizational environment that allows for further team work. To enlarge the potential of recruiting new professionals the multi-disciplinary way of addressing primary care will allow for more valued services. With a more multidisciplinary team the USF could negotiate the "contract-program" to include other services like behavioral, food and exercise consulting, and providing to the citizen the possibility to beneficiate from a more integrated healthcare plan. Moreover, this first result would require further attention and eventually some action from the regulator.

The success depends on the motivation to work together. At the end of the day USF is a small team of GP, nurses, etc., that organize themselves, work autonomously, defining their own rules, searching for ways to offer services that better meet the citizen's needs. In fact, the initial data reveals that USF have been able to reduce the number of patients without GP's, successfully enlarging the schedule (from 8h until 22h) and also improve the "attending quality". Mostly due to the collaborative environment, every patient will always have a GP even if his or her attributed GP is absent. Other physician accessing the health record will examine the patient, avoiding many journeys to the hospital emergency. The Government expects that this new governance model would gradually help solving the shortage of GP in Portugal. In some cases there is already evidence that the citizens have a better response from the USF then from the PHC. This also shows that there is some risk of creating a different kind of access inequity. Furthermore, there are still organizational issues to be tackled like the selection of the leaders and the relationship with hospitals.

The USF *self-organization* is, above all, a culture of interaction, where the participation of GP's, nurses, technicians and other specialists (including hospital clinicians) takes place. *Self-organization* dynamics are of help in finding emerging patterns in patients (like fibromyalgia or diabetes, etc.) or re-engineering the clinical service to better adjust to the demand. Several authors have reflected about complexity in primary-care. From the point of view of learning processes (Ferrão & Biscaia, 2006: 94), from the point of view of communities of practice (Covita, 2006), and also from the perspective of service quality (Durval and Lapão, 2007: 203). *Self-organization* dynamics in clinical environment allow for the enlargement of a portfolio of available solutions and therefore raise the quality of care because it increases the probability of the clinicians to have at hand the solution that better fits the patients' needs. Therefore, as USF managers promote conditions for *self-organization*, it will enhance team capability to respond to new problems and daily complexity. This works like an incentive for the USF team to hire better professionals and promote open communication between everyone. Specific time for reflection is required to create a culture tolerant to errors and to innovation risks. Motivation is also critical to support collaboration, since everybody on the team should be aware that everybody helps everybody else.

The USF need to share best-practices in a sustainable way allows for the use of IS to further improve the relationship with other healthcare actors. Everyone should be open to the Web 2.0 paradigm (Healy, 2007: 3). Dunleavy & Margetts (2006: 488) emphasize that the cutting edge of change has moved on to digital era governance focusing on reintegrating concerns into holistic government control.

Conclusion

We have addressed the issue of innovation and collaboration within the new USF framework as a significant aspect of the new governance model. We have discussed the innovation aspects of re-organizing the USF in order to best adapt to the needs of populations and the professionals, and how the "governance model" with the "contract-program" instrument allowed for the motivation of the professionals to work harder and collaborate to enhance the value delivered, mostly due to the innovation of new ways to integrate chronic diseases and improving general access to primary-care.

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