The development of the Living Lab approach in the Health and Autonomy sector

Robert Picard, Norbert Noury

Abstract—The living lab approach is a strong lever to convert technological potential into valuable solutions in the health and autonomy sector. But this is not easy to achieve nor a short term initiative. We report here the development of this approach in France. Starting in 2011 with an official report the movement took the form of a collective initiative called “Forum LLSA”. Nowadays, the Forum faces new challenges, namely political anchorage and internalization.

I. INTRODUCTION

The health sector activity is expected to grow substantially. Typically, the aging of the population and the focus of hospitals on heavy interventions associated with very short stays are facets of the evolution of this ecosystem today. ICTs offer hope for people concerned about their own health. These technologies are said to empower everyone in managing their own health by themselves (pHealth), or in more serious situations, to maintain secure links between a patient at home and his/her referent professional [1]. As a matter of fact, technologies are there, but who knows really when, to whom, under which conditions they are suited? On the other hand, in a period of economic crises which puts public budgets under pressure, there is an obligation to choose right directions in spendings. This is particularly necessary in the health sector where expenses grow up dramatically. New ways have to be found to link technological offer and needs. Innovation is requested here, but with specific characteristics due to the particularity of the health sector.

In this context it is more than ever necessary to give to see and to understand what are local participatory innovation processes, without seeking standardization which is contradictory to innovative process, but giving the means to develop and to measure the potential of producing values at the economic and social levels and on larger scales. Indeed, this paper presents an original experience combining public power and Living labs in the sector of health and autonomy: the “Forum LLSA”.

II. INNOVATE IN HEALTH AND AUTONOMY: KEY ISSUES

A. Grasping user needs

The success of modern medicine, the discovery of new means to save, cure and care people have the consequence to make healthcare becomes more complex.

As far as technology is concerned, expectation from persons or practitioners is still limited. The integration of the patient knowledge, gained through experiences, in the design is a condition for the effectiveness of the solutions in terms of early acceptance, usability, accessibility, security, and empowerment. All of those characteristics lead to the medical benefit in the medium and long term. Hence, the question of understanding these needs becomes particularly important because these populations are growing. The activities of the health sector are characterized by their unpredictability, the extreme diversity of skills needed to mobilise the exploration of new solutions for ill-defined problems and, finally, the sequence of these problems over time [2]. Assessing the user satisfaction of social care is known to be problematic in itself [3]. Singularity, which is recognized in care at the individual level, is reinforced by the uniqueness of the environment, whether physical (the nature of the home and/or of the medical space) or social (the presence of close relatives or professionals). This situation stresses the importance of the concept of territory in this sector [4]. When technology is at stake, another difficulty occurs: depending on his/her personal history and his/her experience with technology, one will be able to imagine the future benefits of a solution. Professionals themselves are not always aware of the potential value of tools from a health and social care perspective [5][6]. Indeed, there are difficulties in formalizing the lifelike description of health and autonomy activities to address user diversity and to anticipate the value of technology. Approaches to ergonomics [7] have provided opportunities to propose models of users’ activities to link design approaches and new work situations. However, users’ appropriation of new health products or health services involving ICTs involves a more complex and unpredictable process. Some current designs contain misuse, socio-cultural obstruction and aberrant function definition, highlighting the need to organize transition space or co-working space between the main stakeholders along the innovation process.

Robert Picard, PhD Management Sciences, Conseil général de l'économie, de l'industrie, de l'énergie et des technologies, French Ministry of Economy (e-mail: robert.picard@finances.gouv.fr).

Prof. Norbert Noury is with the University of Lyon, lab. INL, France.
B. Developing valuable solutions

The dissemination of ICTs is still slow: The penetration of these technologies into the health ecosystem in France and Europe lags behind what is observed in other sectors. Products and services are scarce and expensive, whereas public authorities, the main financial contributor in this sector, face a shortage of resources. Private investors, manufacturers and service providers do not take the risk of engaging in the development of complex ICT solutions [8] as economic models are still often based on purely medical considerations.

The central issue here is therefore the question of the value of a solution. This value can no longer be only justified by medical benefits: other economical stakeholders will be asked to contribute to the health budget, including the patient itself – or its insurance, assistance company and any other form of contracted financial support. ICTs are also a source of economic growth, leading to job creation and exports. Thus, ICTs appear to be a resource that may be used to develop new and better ways to care for patients [9] especially at home [10].

Therefore, there is a clear necessity to identify the direction for the development of innovative products and/or services in the health and autonomy sector and to fix specific issues related to value and usage. The Living Lab approach was identified as a possible solution to cover the above challenges.

III. THE LIVING LAB APPROACH IN HEALTH SECTOR: THE FRENCH PRACTICE

A. A mission to understand the LL value in Health sector

Concerning France, the High Council for Economy (CGE) has formed a Working Group at the end of 2009, in partnership with the Ministry for Health.

The terms of the mission were the following:

“The purpose of the work consists in identifying the conditions to encourage a new approach integrating research and innovation where users co-elaborate all along the design process (co-creation, exploration, experimentation and evaluation) solutions for health and inclusion. As it occurs in the living lab approach, it demands a strategic thinking about the domain to cover and a participative approach right from the beginning, including all stakeholders – users, consumers, researchers, developers, project managers, entrepreneurs, investors, public authorities, …to lead to a solution matching the need. The domain is large, as it concerns potentially all eHealth applications and services as well as ergonomics of tools related to medical devices.”

Every kind of stakeholder (public & private) was duly represented in this Working Group. The group started from the beginning of 2010 until mid-2011. An empirical study was also conducted through the visit of several existing Living Labs (LL) and interviews of LL stakeholders. A final report was issued in August 2011 [11]. However, the knowledge gathered during the period is much larger than the report itself. This paper present hereafter some lessons gained through this work.

B. A diversity of experiences

A total of 19 Living Labs (15 in France, 1 in Sweden, 1 in Spain, 1 in Germany and 1 in Canada) operating in the sector of Health, autonomy and inclusion were selected and duly visited. These Living Labs are not necessarily recognized by ENoLL (European Network of Living Labs). They are involved in products and services design for patient and/or for Health professionals. For example:

- The “Institute for the vision” has implemented a living lab called Street Lab [12] where blind people can experiment the use of products adapted to their disability in a real life environment;
- “Autonom’ Lab” [13], an association in the Limousin region where products and/or services designed for elderly people are chosen by working parties, implemented and experimented at their home;
- The “Future Care Lab” [14], based in Aachen, Germany, allows multidisciplinary research and innovation in exploring, experimenting and evaluating the value of different technologies for immersive solutions that could be adopted by patients, medical doctors and other stakeholders.
- The “Botnia Living Lab”, based in Lulea, Sweden, operates in different sectors such as energy, media, mobility and health & wellbeing [15]. It focuses on supporting human-centric innovation of advanced ICT Services for “Extended Capabilities and Mobility” with access to a continuously growing community of 6000 users. Between 2005 and 2009, it has executed more than 50 trials, 100 user studies with the outcome of more than 10 products/services available today on the market. The region has adopted a care-smart vision for “Distance-independent everyday healthcare”.

C. Benefits

We will give here an example which shows the perceived benefits of such Living Lab approach at this level:

In the South East of France, a Telestroke solution was implemented. The service includes the use of a videoconferencing system (high resolution, high quality sound), a graphical editor to share DICOM format, and the ability to exchange medical files. Since the implementation of the system, the number of patients transferred has been reduced by half. During the first years, an estimating saving of 3.5 million € has been made (Cost of transport). The gross investment of € 0, 5 million has been reimbursed after only 2 years.

With such results, the regional team brought evidence that the concept is robust, allows for faster development of products and services. The following figures result from a continuous stream of projects managed by the institute, with a capacity of around 15 projects conducted simultaneously:

- Robustness of new concepts (measured by the rate in percentage of design products authorized to enter into the market): it reaches about 50 % with the Living Lab
approach instead of only 30 % success in normal conditions (academic sources);

- Time to market (for this kind of product – significant improvement of existing product): with a Living lab approach it is between 9 months to 1 year, whereas in normal conditions it is 1.5 to 2 Years.

More than 60 organizations have joined the LL initiative from the beginning and take benefit of these results. This success could not have been reached without a high level of acceptance by medical doctors: Neurologist (at home with Web connections, or in neurology services with sound and video connections to a remote hospital). This high level of acceptability results also from the Living Lab approach that engages users/patients at the earlier stage of design & development...

D. The need for convergence

At national level, health innovation strategy is in continuous discussion within both Health and Industry Ministries for defining to the most appropriate the level of support to Living Lab initiatives. However, some regions have already defined their own strategy to reach their expectations. The Living Lab approach is really a “bottom up” approach.

One of the outcomes of our empirical study is a “state of the art” of the Living Labs implementation in the health sector (see § E., F.). This knowledge has been shared and discussed beyond the initial working group within a specific “co-design” session, organized in one of the visited Living Lab. It has been then packaged into an information and education program toward stakeholders and future living labs participants to ensure they have a basic and common understanding about architecture, role & missions and the value & challenge of living labs for the health and autonomy sector. This education program is ongoing and takes the form of working groups, dedicated to specific topics (see § IV). All these considerations were the basement of what is now known as Forum LLSA (Figure 1).

The Forum LLSA\(^1\) emerged after the issue of the CGE report, as a joined initiative, without legal structure so that everyone can join. Its mission is to pursue the collective effort done and to develop and maintain the experience and practices gained during the initial period. We will develop its actual operation hereafter (see § IV).

To come back to the early stage, several criteria were defined for characterizing each of the visited Living Labs:

- Issues & territories:
  - Business range of the Living Lab (local, regional, national, EU, global);
  - The location of the Living Lab (e.g. physical or virtual space, natural environment);
- Ecosystem
  - Participation of the territory stakeholders (e.g. industrial clusters, hospitals)
- Value proposition
  - The LL design as a specific process in which User Experience (UX) is holistic enough to include all range of challenges from social up to economic aspects;
  - User communities as the main stakeholder for anticipating the potential level of adoption;
- Network of value / actors
  - Involvement of one or several industrial clusters within the Living Lab;
  - Involvement of hospital(s) within the Living Lab;
  - The existence of a multidisciplinary team integrating research and innovation stakeholders as public and private parties;
- Services
  - The application of User Experience Design as opposed to the traditional Industrial Design approach;
  - The degree of user involvement within the different LL design activities (co-creation, exploration, experimentation and evaluation);
  - Clinical trials conducted in partnership with the Living Lab to support SMEs in this complex environment
- Organization model
  - nature of the ecosystem, type of governance;
- Sciences & Technologies
  - User participation methods, techniques and tools;
  - The type of physical space e.g. immersive space or natural environment or a combination of both types;
  - The nature of specific equipment used to support earlier user experiences and observations;
- Economics/ Business Model
  - Business model of the Living Lab such as: operating as a Service Provider (SP) offering scientific and innovation services to entrepreneurs or as a Share Holder (SH) offering membership for getting access to both services and equipment
  - Financing model (Public/Private);

Regarding the business model, scientific and innovation services could be co-funded by public authorities within

\(^1\) LLSA : Living lab en santé & autonomie (health & autonomy LL)
specific research activities for encouraging entrepreneurs to benefit the LL capacities in terms of knowledge and infrastructure as well as user communities and their experiences. In the case of a Shareholder business model the main funding comes from shareholders’ financial contributions (e.g. industrial clusters, hospitals, universities, regional or national financing organizations) such as membership fees that provide access to a number of LL services and equipment.

The above first list of criteria is continuously revisited within the Forum LLSA, to identify a little number of key characteristics. However, it was obviously needed to start a tentative characterization of LLs in order to further discuss and share views about the LL scope and different aspects. This includes questions and problems to be solved by a LL and more globally, what can be the value of a LL in the Health and Autonomy sector. This is suitable to the recommended “bottom up” approach for developing LL policies while it should not lead to any “standardized” or “generic” form of LL implementation. Without such a convergence of views (scholars currently help in studying the emerging scientific foundation of LLs), LLs stakeholders will not be in a position to share “best practices”.

This effort of convergence was initiated right from the beginning, with some key results (presented in § E. and F.) hereafter) which are today considered as the Forum’s foundation.

E. Issues

Beyond the differences between LL, it was possible to formulate the following assessment [11]:

- Diversity and complexity of the patient “ecosystem”
- Specific difficulties to capture patient needs (including those of the ecosystem)
- Difficulties to express and validate the needs of professionals (lack of time, type of knowledge)
- Value management, beyond the traditional “medico-economic” value.

The development of this approach imposes to control the following potential negative issues to be able to provide the expected results:

- Excessive focus on technological issues and challenges; the risk here is to over-invest technological means and skills, instead of improving the innovation process and knowledge management;
- Abuse of user vs. patient voice gathered through the LL approach for purely marketing purpose;
- Blocking of the final steps of the innovation process due to legal or regulatory aspects, concerning in particular the remuneration of doctors or other practitioners;
- Short term initiatives with no realistic future.

F. Early identified challenges

Several challenges are associated with the Living Lab approach, specific to the Health sector. We develop hereafter a few of them, namely: Innovation target, funding, leadership, user role, intellectual property, data protection, assessment of solutions.

Economical versus social innovation

The social dimension is particularly sensitive in the health sector; on the other hand, there is a need for new business models here, due to the shortage of public budgets. Experiences of social innovation processes have been gained: it is still an emerging way with high risk. Results are uncertain, but new modes must be found, specifically in this sector.

Funding & value proposition

Public budgets are under pressure. There will be more public/private partnerships in the future. Though, both sides are not used to cooperate, and it is even more difficult to develop partnerships when final results cannot be easily specified.

For the time being, funding is mainly public: this raises the question of how to better take into account the industrial perspectives and to involve the industry; France intends to take some initiatives in this field concerning the national actors (see hereafter).

Funding may come from Industry, Insurance/reimbursement organizations/patients themselves. They all need to have proof that the new approach works appropriately.

Therefore, a new kind of value (beyond the clinical benefit - not just traditional medical perspective) needs to be demonstrated. Part of the economic model consists in transferring some costs from one organization to another. So, being able to properly evaluate future offers is also a challenge (see hereafter).

Leadership versus partnership equilibrium

In theory, within the Living Lab approach, no actor can take the leadership. It shouldn’t be a matter of financial contributor: Even the patient, not supposed to be a payer, is a key participant.

The issue is more related to the possible convergence between stakeholders. Two of them seem to be in a position to initiate the process:

- The Policy maker (at regional or national level) that need to find innovative and less expensive services to answer to the expectation of the population in the healthcare domain;
- The industry company that has innovative ideas and wants to improve the current situation with the users [16].

However, as a matter of fact, academics were often the initiators of existing LLs. Some patient organizations could also take initiatives in this field...

Efficiency assessment and evaluation
The Living lab concept is extremely attractive but its efficiency needs to be permanently monitored to ensure deliveries are in line with promises. There is definitively a need for a “generic” or “universal” evaluation model suited to any ICT solutions in healthcare, and in the same time including the specificity of the Health sector. Such a model should be able to demonstrate the added value of eHealth in a large number of applications. A first version of such a model, compatible with HTA recommendations, was presented in a communication published in 2011[17].

Other critical challenges were identified, which still require attention and vigilance at forum’s level: they are discussed nowadays within permanent working groups, which are presented hereafter.

IV. ONGOING & NEW CHALLENGES

To summarize, availability of efficient living labs is a key element for a successful introduction of technologies, serving the modernization of Health systems and the promotion of social innovations, and it is the aim of the Forum LLSA to help it happen.

But this takes time: It remains therefore critical to go on capitalizing on already-existing structures to share best practices, best and worst known-methods, gold standards, instead of creating each time new structures from scratch. The number of French Living Labs operating in the health sector (LLSA) is still growing rapidly. Including projects, starting LL and operative ones, there are today (middle 2015) more than 30 of them, 2/3 being operational. It has to be quoted that the large majority of new leader of LLSA initiatives contact spontaneously Forum’s members to benefit from the collective experience, and join the Forum. The Forum is therefore facing following new challenges:

A first challenge there is to continue to give to everyone the opportunity to exchange views and good practices. With an increasing number of members, it must be organized in a more structured way.

A second one is to address key issues allowing the existing Living Labs to be sustainable; in effect, most of them started with public aid, but for only a short period of time.

The third challenge is to open the community to Europe and the rest of the world, as the market is worldwide.

A. Sharing views and practices

The Living labs are given many opportunities to meet and to work together.

Two annual plenary sessions are organized, with a very high level of participation. Specific workshops take place to share views about specific urgent topics, concerning communication issues, presence in international events, or for information about common opportunities.

Members use some common media tools (website, Newsletter, social media…) in collaborative ways.

Working groups (WG) have been set up, with specific shared issues, namely: Economy; legal & regulatory issues; co-design; Public Health ;…

The work carried out by these groups is intended to be published, the first communications being expected at the end of year 2015.

In parallel individual Living Labs may participate to regional or European studies which are communicated to Forum’s members.

Opportunities for Bilateral and multilateral projects are emerging, as no single Living Lab is able to cover the entire field. The fact that Living Lab leaders know each other, share common ethics and methods, is obviously a key explicative factor.

B. Addressing together key issues

One important value proposition of the Forum LLSA is to go further in developing a common, valuable knowledge about what is actually an efficient, motivating, durable living lab approach vs structure, taking into account the specificity of health and autonomy sector: professions, regulatory issues, human relationships related to disease and frailty, to quote but a few. The purpose of WG is also to easily figure out what has already been done that could be (smartly) reproduced somewhere else. We present hereafter some aspects of the WG thoughts.

- When the user is a patient, a disabled person, an elderly person, his experience is at the same time very valuable for the design process and difficult to collect, formalize and manage. Concerning the expression of the needs, specific rules have to be given, including the definition of skills and tools necessary to obtain the desired result. A lot has still to be done in this field, specifically for this sector. What is at stake is the long term involvement on patients or citizens thanks to a user-friendly and usable solution. This is the condition for the development of new individual responsibilities in the domain of “health capital” management. The WG “Human factors and co-design” deals with Leadership & project management, co-design methodologies & practices (based on use cases), from which valuable knowledge from human sciences are identified.
- The WG “Economy” deals with LL sustainability & Business models; LL impact on public policies; LL added value to innovative solutions. The challenge is here to develop a single method/technique/tool for evaluating the Living Lab approach, including the evaluation of the return on investment. The use of Business Model Canvas approach [18], adapted to the LL’s and Health and Autonomy specificities seems particularly fruitful: Exchange has taken place with a Canadian organization which developed a similar approach [18]. Work has also been carried out to point out the specific value proposition of the Forum itself (Figure 2).
- As far as the “Legal & regulatory” WG is concerned, topics are: Intellectual & industrial property; Commitments & contracts; Open date, data protection. A new organization of the Intellectual Property needs to be found with the increase of the number of concerned stakeholders from industry, healthcare professionals to the patient itself.
The involvement of the patient – or the citizen – to benefit of its experience and potentially resulting ideas is particularly important. This put new specific ethical questions to be solved right from the beginning of the innovation process.

The problem here is also that regulatory and legal issues are all at once complex and unstable, and are differently addressed around European countries. Furthermore, some engineering is necessary to make these rules suitable to the Living Lab approach. With the development of connected objects and in the context of European regulatory evolutions (“open data”), this field is particularly sensitive. Several Living labs have now gained a European experience, through the participation to European project. The WG leader is an academic lawyer, very much involved in debates around these topics.

- Finally, a Public Health WG studies the ways and conditions to introduce the LL approach in clinical research, with special attention to connected objects. Doctors, epidemiologists, project leaders in this field, joined this WG to investigate together this issue.

**Figure 2. The value proposition of Forum LLSA.**

**C. European and international dimensions**

During the early study period, contacts were taken with other LLs operating in European countries on the basis of the European Network of Living Labs (ENoLL). Though, the need to further increase collaboration and exchange between these structures, beyond the national frontiers has been immediately identified: Operational results and achievements should be shared openly and efficiently. After these few years, some French experiments are possibly valuable success stories that probably could be compared with similar realizations or replicated elsewhere in France and in Europe or abroad.

We gave above several arguments to explain why we think that there is a need for a specific Health and Autonomy thematic network of Living Labs. Such a focus on a thematic approach at the European level would allow having deeper studies in a shorter period of time and would constitute a critical mass effect as confirmed and expected by the visited LLs in other European countries. The market is at least European: helping the development of new services in a larger healthcare market will foster its sustainability; citizens expect to find all around Europe the same conditions concerning the management of their Health capital. Combining these Issues in a LL perspective will empower industry, entrepreneurs, health care users and patients to create some new innovative and original approaches.

**D. Policy issues and foreseen actions**

As mentioned earlier in this paper, France is currently launching initiatives concerning the promotion, information, coordination and support of LL initiatives in the Health sector. However, this is not sufficient, and there is a need both to anchor the Forum LLSA in the national policy and to give a European dimension to these initiatives.

At a national level, is has to be stressed that without the Forum’s initiative, the success of the Living Lab approach in the health and autonomy sector could have led to dispersion of public effort, with local and frail results, without the ability to scale up resulting solutions. Furthermore, the Forum LLSA is in a position to point out legal and regulatory problems blocking innovation: not only because it is legitimate by LL’s on the field, but also thanks its strong relationship with the CGE. In the other hand, a classical administrative structure could have been costly and not necessarily in a position to catch local dynamics characterizing the actual LL initiatives. But as the LLSA movement is recognized and the operational LL’s are numerous, some structural changes will probably be necessary at the Forum’s level. This is currently studied, and decision may be taken in the next few months.

Concerning the European dimension, an opportunity came from the European community which launched a “KIC” for the Health sector named EIT Health. KIC stands for Knowledge and Innovation Community. The Mission of the KIC EIT Health is to speed up entrepreneurship and innovation in healthy living and active ageing, providing Europe’s top talents with new opportunities and resources to the benefit of all citizens. It includes 52 Core Partners, 92 Associate Partners. One node is located in France, with 12 core and 6 associated partners.
EIT Health’s partners are in a position to provide access to a wide range of living labs and test-bed facilities that are of benefit for Innovation projects as well as being available to support start-ups and small enterprises. EIT Health LL’s definition suits perfectly well to the Forum’s one: Living lab: An experimentation environment in which technology is given shape in real life contexts and in which users are considered co-producers. New technologies and concepts are tested for their business concept, societal case, quality of life improvement etc.

Those make the Forum a “natural” partner of the KIC, as LLSA members are spread in every French region, and therefore present in the French selected territories. Working with KIC partners will mean accelerating partnership with other European nodes and related European Living Labs.

V. Conclusion

The Forum LLSA focuses on conditions for developing a true citizen and participatory approach in the design of new products and services for health and autonomy, service innovation and health democracy.

This Forum becomes a key element in the policy of health democracy: it is part of a long-term movement, whose development was particularly impacted by the French law on the patient's right in 2002. This is not a decision-making body, nor a “do” structure: it is a body of democratic legitimacy which role will be to balance public action in a logic of long term and taking into account the generality of citizen concerns, including those of minorities or the actors with low economic weight. Its democratic legitimacy entails three dimensions: impartiality, reflexivity, proximity [20].

-Im partiality: it comes to emerge independent recognized positions in the sensitive domain of the promotion of technologies in health and autonomy. The Forum has internal rules and a process to make its proposals visible, in a permanent logic of opening and listening, to cultivate and demonstrate over time that non-partisan position. Its composition, reflecting the diversity of civil society and the economic ground, contributes to this legitimacy.

-Reflexivity: Explicitly anchored in the French law of 2002, the work of the Forum will contribute to constantly recall the main principles of this law in the actions associated to innovation in health and autonomy policies. Entered on the long term, the Forum will play a technology watch.

-Proximity: Each one aspires that the specificity of his situation will be taken into account, and should not be subjected to the mechanical cleaver of an abstract rule. This is particularly the case of the less powerful economic actors: the citizen himself, the small business, the local association, etc. The mode of operation of the Forum, which fits into an absolute principle of non-subsidiarity to the territorial actions and constant sharing of the experiments conducted at this level, allows the expression of this dimension.

Acknowledgements

This work was carried out within a working group formed and leaded by the French Ministry of Economy (CGE) in partnership with the Ministry of Health, whose mission consisted in understanding the LL value in Health and Autonomy sector. The author wishes to acknowledge the contribution of all members of the CGE working group and of all participants of the numerous workshops and discussions. He also wishes to acknowledge our gratitude and appreciation to all representatives of the visited Living Labs for their openness and kindness to participate to the interviews and other open discussions. Finally, a special thanks to the people who have locally organised and conducted the LLs visits.

Contributors: Isabelle Gendre (Ministère de la Santé), Bruno Charrat (Centre National de Référence Santé à Domicile et Autonomie), Marc Pollot (INRIA), Antoine Vial (Haute Autorité de Santé), Gérard Comtet (Agence Régionale de Développement Rhône-Alpes), Stéphane Suzev (Autonom'Lab LL) and Hervé Barge (Agence Régionale de Santé Franche-Comté), all members of the CGE Working Group (See [11] for a complete list of participants).

References