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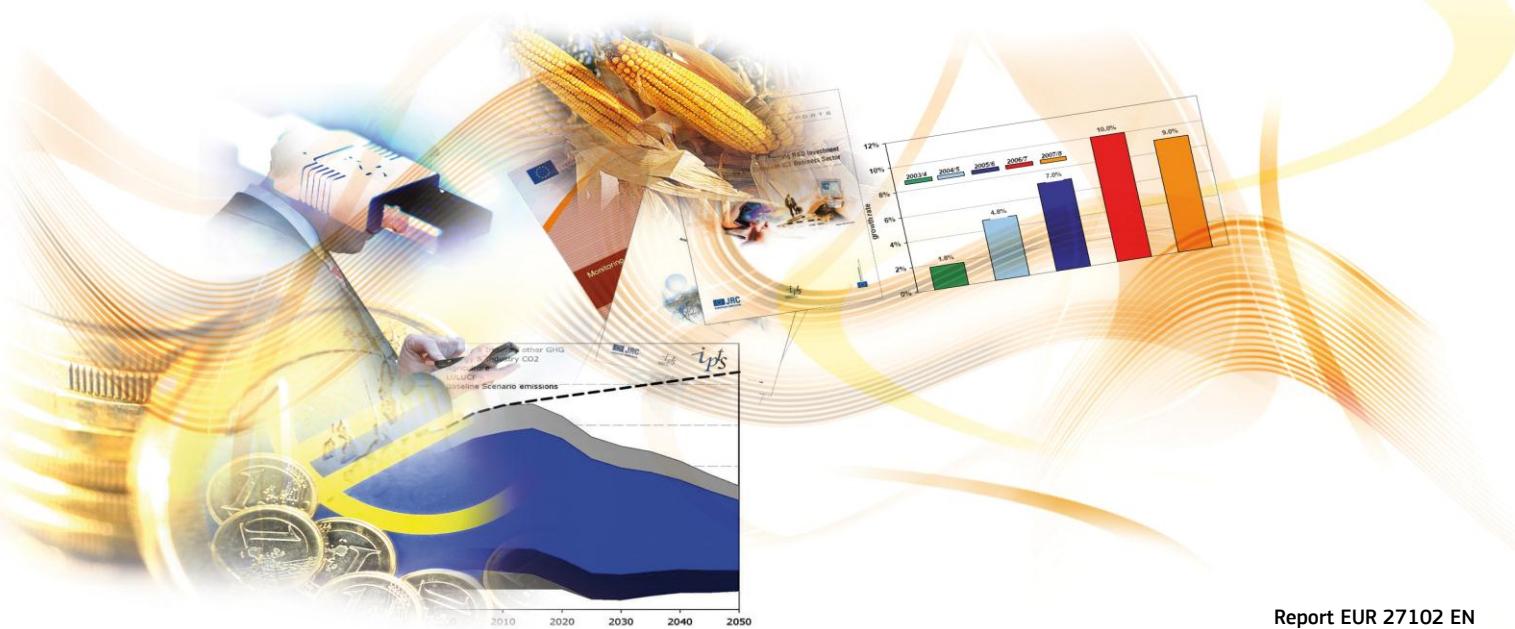
Strategic Intelligence Monitor on Personal Health Systems Phase 3 (SIMPHS3)

*BSA (Spain)
Case Study Report*

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Abstract

Badalona Serveis Assistencials (BSA) is an integrated private care organisation, funded entirely by public capital. It manages the Hospital Municipal de Badalona, the Homecare Integrated Service, the Socio Health Centre El Carme, 7 Primary Care Centres and the Centre for Sexual and Reproductive Health, providing care to a total population of 419,797 inhabitants in a very populated suburban area of Barcelona (Spain). BSA has been responsible for both health and social care services in this area since 2000, when the Badalona's City council included social care in the service provided by BSA . This has fostered a new model which puts citizens' and patients' needs at the centre of the system.

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Preface

The Strategic Intelligence Monitor on Personal Health Systems (SIMPHS) research started in 2009 with the analysis of the market for Remote Patient Monitoring and Treatment (RMT) within Personal Health Systems (PHS). This approach was complemented in a second phase (SIMPHS2) with the analysis of the demand side, focusing on needs, demands and experiences made with PHS by healthcare producing units (e.g. hospitals, primary care centres), healthcare professionals, healthcare authorities and patients amongst others.

Building on the lessons learnt from SIMPHS2 and on the European Innovation Partnership on Active and Healthy Ageing initiative, SIMPHS3 aims to explore the factors that lead to successful deployment of integrated care and independent living. It also defines best operational practices and guidelines for further deployment in Europe. This case study report is one of a series of case studies developed to achieve these objectives.

The outcomes of SIMPHS2 are presented in a series of published reports which discuss the role of governance, innovation and impact assessment in enabling integrated care deployment. In addition, through the qualitative analysis of 27 Telehealth, Telecare and Integrated Care projects implemented across 20 regions in the eight European countries investigated in SIMPHS2, eight facilitators have been identified, based on Suter's ten key principles for successful health systems integration.

The eight main facilitators identified among these as necessary for successful deployment and adoption of telehealth, telecare and integrated care in European regions are:

- Reorganisation of services,
- Patient focus,
- Governance mechanisms,
- Interoperable information systems,
- Policy commitment,
- Engaged professionals,
- National investments and funding programmes, and
- Incentives and financing.

These eight facilitators have guided the analysis of the cases studied in SIMPHS3 and a figure showing the relative importance of each facilitator is presented in each case study.

In addition to the above facilitators analysed in each case report, a specific section is dedicated to the analysis of care integration. It should be noted that the definition of vertical and horizontal integration used in this research is taken from the scientific literature on integrated care¹ and differs from the one mentioned in the European Innovation Partnership on Active and Healthy Ageing Strategic Implementation Plan.² We define horizontal integration as the situation where similar organisations/units at the same level join together (e.g. two hospitals) and vertical integration as the combination of different organizations/units at different level (e.g. hospital, primary care and social care).

¹ Kodner, D. (2009). All Together Now: A Conceptual Exploration of Integrated Care.

² http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/steering-group/operational_plan.pdf (page 27)

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Case Outlook

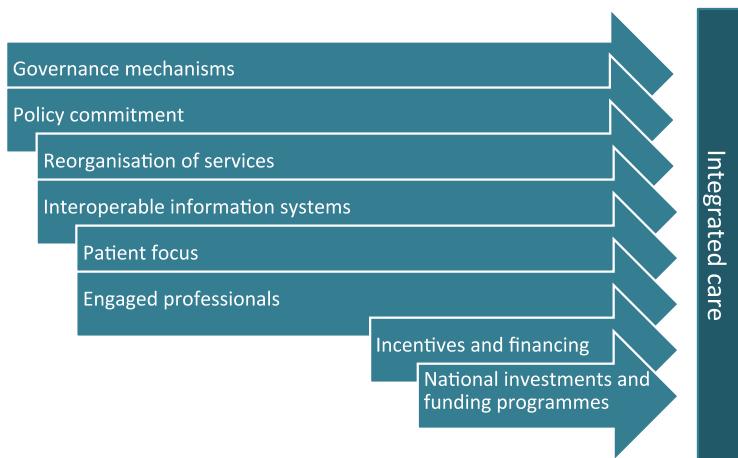
Badalona Serveis Assistencials (BSA) is an integrated private care organisation, entirely funded by public capital. It manages the Hospital Municipal de Badalona, the Homecare Integrated Service, the Socio Health Centre El Carme, 7 Primary Care Centres and the Centre for Sexual and Reproductive Health, providing care to a total population of 419,797 inhabitants in a very populated suburban area of Barcelona (Spain). BSA has been responsible for health and social care services in this area since 2000, when the Badalona's City council included social care under the BSA service provision, fostering a new model that would put citizens' and patients' needs at the centre of the system.

Within this context, BSA launched the Care Model for the Patients with Complex Chronic Conditions (MAMCC) that must be followed by all professionals from BSA when dealing with these patients' needs. This model is supported by a stratification of the population that allows BSA to

- (1) position the patient at the centre of the care model;
- (2) plan and carry out interventions focused on identifying, preventing and treating in advance acute episodes to avoid further hospitalisations;
- (3) design and implement individual integrated care plans based on the evaluation of each particular need and the general geriatric evaluation;
- (4) promote independent living for these patients as far as possible while maintaining good quality of life;
- (5) coordinate the work of the interdisciplinary teams doing the interventions; and
- (6) guarantee and provide a continuum of services.

In order to achieve its objectives, BSA has developed an institutional and organisational model with policy support and commitment that facilitates full integration. It includes fully integrated services which cover the continuum of care, and work across tiers of care with a multidisciplinary team of specialists, general practitioners, nurses and social workers. Furthermore, this organisational innovation has been aligned and supported by technological innovation. BSA EHR is a fully interoperable information system enhancing communication and information flow across the continuum of care, supporting health and social care professional practice.

Governance and policy commitment could be considered as the main facilitators of the BSA case. These two drivers have pushed the next two forward: i.e. reorganisation of services and interoperable IT systems. These are followed by engaged professionals and the focus on patients' needs. Lastly, incentives and financing, and national investments and funding programmes have played only a minor role in this case.



1. Background

1.1 Spanish social welfare and health care services

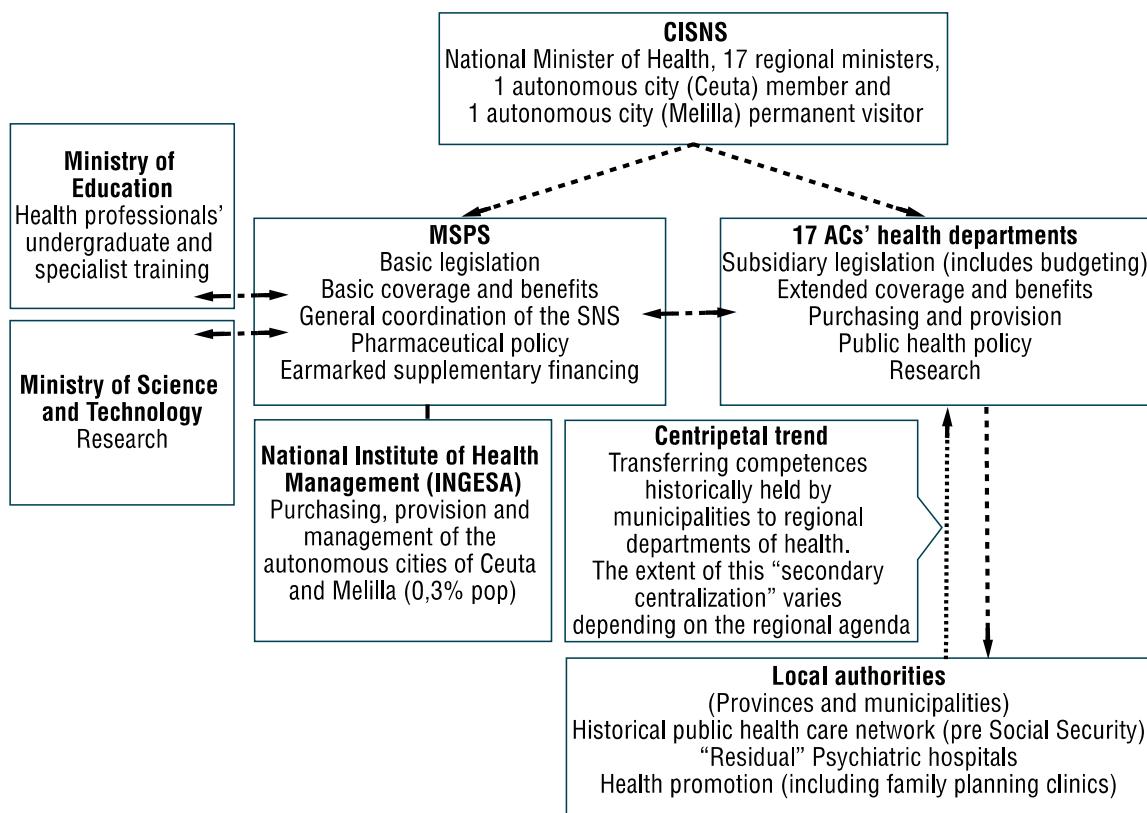
The Spanish Constitution of 1978 established the right to health protection and healthcare for all citizens. As laid out by the Ministry of Health, Social Services and Equality (2012), the following principles and criteria enable citizens to exercise this right:

- Public funding, universal coverage and free healthcare services at the time of use.
- Defined rights and duties for citizens and public authorities.
- Political decentralisation of healthcare, which is devolved to the autonomous regions.
- Provision of comprehensive healthcare which strives to attain high levels of quality and is duly evaluated and controlled.
- Integration of different public structures and health services under the National Health System.

Spain has a statutory national health system (SNS), which is characterised by universal coverage and funded by taxes. Services are largely provided free of charge at delivery, whereas most pharmaceuticals prescribed to people aged under 65 require a co-payment of around 40% of the price. Private voluntary insurance (OVI) plays only a minor role in the Spanish health system. The services provided are mainly complementary to the services provided under the statutory health system, and usually imply reduced waiting times for specialised care or access to services that are limited within the benefits package of the SNS. The political control of the Spanish health system rests with the regional governments (Comunidades Autónomas). There are 17 regional health ministries across Spain, each having primary jurisdiction over the organisation and delivery of health services within their respective regions. In its most typical form, a regional health system of an autonomous community is composed of a regional ministry (Consejería de Salud) that defines health policies and regulates and plans health care, and a regional health service that provides the services. The regional ministry organizes and structures the health service within the region. The health service is usually made up of two executive organisations that provide primary care or specialist care.

However, it has become very frequent that regional health systems have integrated primary and specialist care under a single management structure. A single primary care team (PCT), allocated to patients and not freely chosen, is the gatekeeper for the access to services, as access to specialist care largely depends on prior referral from the GP. As a means of improving waiting list management, some specialised care delivery is contracted out to private hospitals, but around 40% of all hospitals in Spain belong to the SNS. Public health expenditure in Spain is largely financed through general taxation (>94%), supplemented by contributions from payroll tax and employers contribution, and the health insurance funds for civil servants.

Figure 1: Spanish National Health System

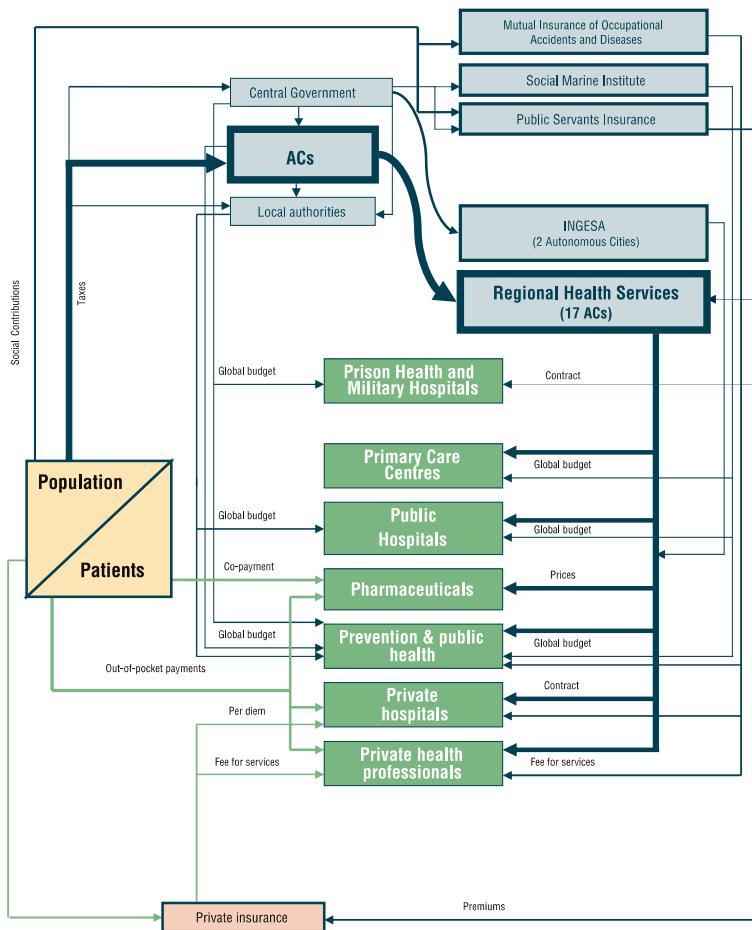


Source: García-Armesto et al (2010)

Public health expenditure relates mainly to both in- and outpatient specialist care (54%), primary health care (16%), pharmaceuticals (19.8%), as well as prevention measures and general public health (1.4%). The regional governments administer the largest share of the public health resources, whereas the central government and the municipalities are allocated only about 3% and 1.25%, respectively. The primary care network is completely public, with care professionals working in multidisciplinary teams that can comprise GPs, nurses, social workers, or paediatricians and are linked to laboratories or diagnostic centres.

Figure 2 shows the financial flows across the Spanish NHS. The allocation formula is based on a per capita criterion, weighted by population structure, dispersion, extension and insularity of the territory.

Figure 2: Financial flows across the Spanish NHS



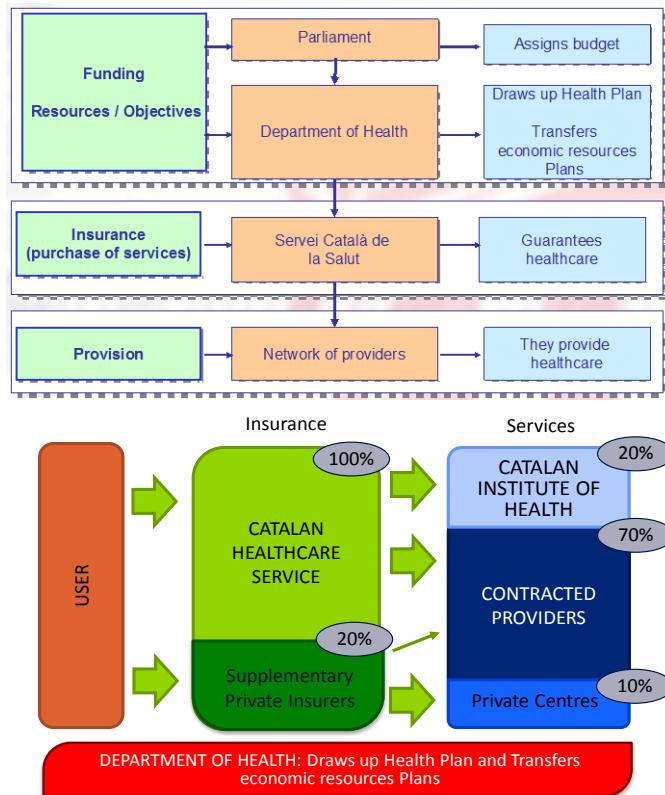
Source: García-Armesto et al (2010)

1.2 Catalonia region

Catalonia is one of the 17 Autonomous Communities, with a population of roughly 7 million inhabitants. This region has full competences in health services, as part of the decentralised Spanish health system. The Catalan government (Generalitat de Catalunya) has developed its own organisational model based on the historical evolution of the Catalan health system. The Department of Health (DSGC) is the maximum official authority for the definition, planning and development of healthcare services in Catalonia. Servei Català de la Salut (CATSALUT) acts as a purchaser of services and guarantees quality control while a network of public and private organisations provides the healthcare services.

The Catalan Health system, as defined by Health Plan for Catalonia 2011-2015, is comprised of 451 primary care centres, 831 local healthcare centres, 96 acute care hospitals, 96 social health centres, 158 mental health centres (for adults and children/teenagers), and 42 centres for inpatient mental health care. The system is organised within 7 health regions divided into 56 health sectors and 369 basic health areas.

Figure 3: Regional health system characteristics



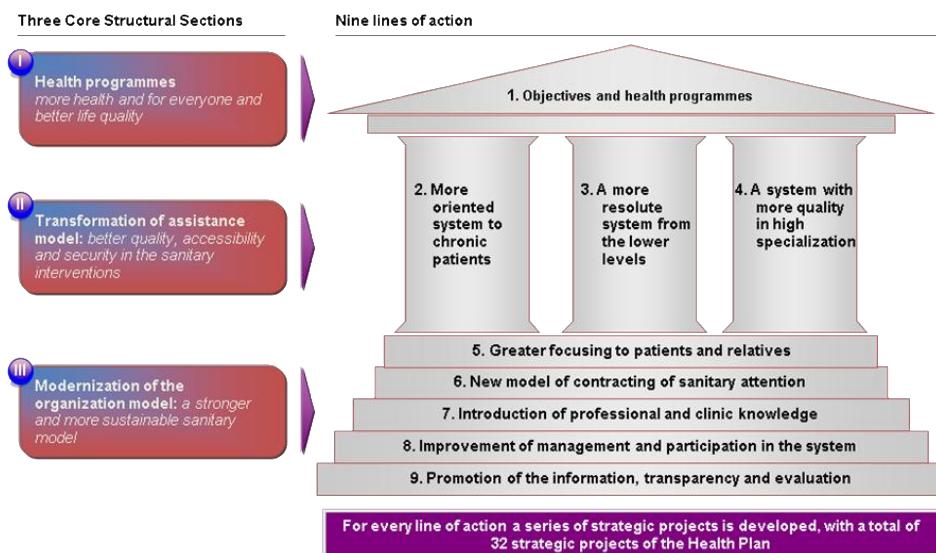
Source : Martinez (2013) and Contel (2014)

The Health Plan for Catalonia 2011-2015 mentions that 30% of these resources are directly owned by the government (through the ICS, National Health Institute, the biggest provider in Catalonia), while foundations, health insurance companies and other private non-profit authorities own the remaining 70%. This situation has facilitated the separation of functions (purchasing-providing) of the Catalan Health care model where CATSALUT purchases health care services from private and public providers under the terms of harmonised agreements and tenders.

Within this context, the Department of Health of Catalonia has launched a strategic plan “Health Plan for Catalonia 2011-2015” structured into 3 transformation pillars, 9 lines of action, and 32 strategic projects, which constitute the roadmap for the health system until 2015 (see **Figure 4** below). This plan foresees three very significant challenges:

- (1) the continuously ageing population (the number of people over 65 years of age will increase by over 200,000 during the next 10 years);
- (2) worsening habits and lifestyles (one in every two Catalans is overweight); and
- (3) the increasing incidence of chronic diseases (in 2010, 34% of Catalans stated that they suffered from at least one chronic disorder).

Figure 4: Health Plan for Catalonia 2011-2015



Source: Departament de Salut. Generalitat de Catalunya (2012).

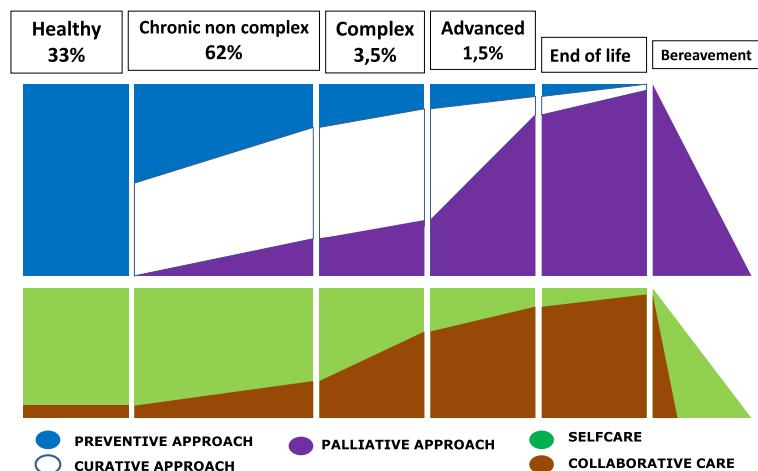
Transformation pillar II “Transformation of the healthcare model: better quality, accessibility and safety of healthcare interventions” puts the emphasis on promoting integrated care within the Catalan Health system using line 2 “A system more oriented to chronic patients”. The strategy for this line is based on six major principles: (1) A population-based approach focused on all people - from the healthy patient with or without risk factors, to those who have diseases at any stage of progression; (2) Citizens have a role to play in being responsible for their own health; (3) The strengthening of professional initiative; (4) A comprehensive healthcare model; (5) The use of new technologies and (6) inter-ministerial collaboration. This strategy is carried out in six major projects, which:

- Implement integrated clinical processes for 10 diseases.
- Foster health protection and promotion programmes and disease prevention.
- Encourage patients and caregivers to take responsibility for their own health and promote self-healing.
- Develop healthcare alternatives within the framework of a comprehensive system.
- Deploy regional programmes for complex chronic patient care.
- Implement programmes for the rational use of medicines.

All these major projects reflect the need to define interventions and organise the services based on population stratification (see Figure 5) and a proactive, integrated approach (see

Figure 6). The Catalan Ministry of Health and the Ministry of Social Welfare and Family have created the Chronicity Prevention and Care Programme (PPAC), which should enable health and social sectors to work together in managing chronicity. Chronicity is an evolutionary process linked to the natural course of diseases, with certain initial stages that may be asymptomatic and a progression that can bring about acute care episodes, complications, and co-morbidity until the end of the person’s life.

Figure 5: The continuum of chronicity in Catalonia



Source: Contel (2014)

The different stages of illness progression create different groups within the population with different needs and risks. Therefore, different objectives and approaches are necessary.

Figure 6: Health care solutions for different strata population

Characteristics	Objectives	
Complex Chronic Patients	<ul style="list-style-type: none"> Patients with multiple chronic diseases or a severe main chronic disease and co-morbidity, usually with disability, and with frequent flare-ups and imbalances with loss of functional capacity 	Case Management
People with chronic diseases in risk or fragile situations	<ul style="list-style-type: none"> People with an advanced chronic disease in risk situation for complications but maintaining the capacity of self-healing. In advanced stages they can move towards an upper level own situation (complex chronic patient) 	Disease management
People with risk factors or low complexity chronic diseases	<ul style="list-style-type: none"> People with risk factors for chronic diseases or little evolved chronic diseases 	Support for self-healing
General population	<ul style="list-style-type: none"> Population without risk factors nor underlying chronic pathology. 	Protection and promotion of health and disease prevention

Source: Contel (2014)

The following table summarises the main statistics on the Catalan health system.

Table 1: General information about Catalan Health System

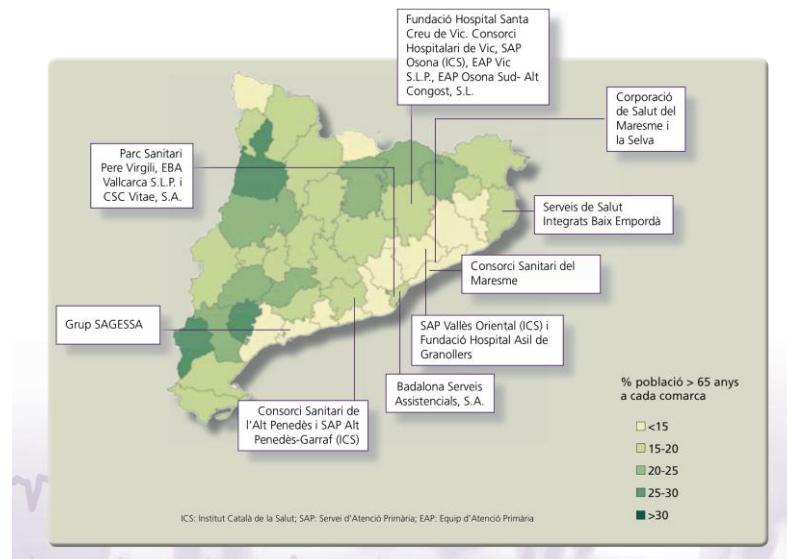
Geographical coverage km²	32,106
Inhabitants per km²	235
Number of inhabitants	7,568,988
Life expectancy at birth, years	77.3 males – 83.8 females
Regional GDP (2012), billion €	215
Regional GDP per inhabitant (2012) €/inhabitant	28,289
General Practitioners /1.000 inhabitants (2010)	0.72
Specialists /1.000 inhabitants (2010)	2.17
Regional Budget for Health services management (2013), billion €	17.8
Health care professionals / 100.000 inhabitants	317
Regional health care budget € per inhabitants, (2013)	2,345
Hospital beds (2012)	23,600
Hospital beds/1.000 habitants (2012)	3.1
Chronic diseases information: The mortality rate due to chronic disease is as follows: 48% cancer disease; 48% cardiovascular disease; 4% COPD	

Source: Departament de Salut. Generalitat de Catalunya (2013)

1.3 Badalona Serveis Assistencials (BSA) integrated care approach

Badalona Serveis Assistencials (BSA) is an integrated private health and social care organisation, funded entirely by public capital. It manages the Hospital Municipal de Badalona, the Homecare Integrated service, the Socio Health Centre El Carme, 7 Primary Care Centres and the Centre for Sexual and Reproductive Health. It provides care to a total population of 419,797 inhabitants in a very populated suburban area of Barcelona.

Figure 7: Main integrated care experiences in Catalonia



Source: AQuAS, 2013

BSA differs from the rest of the healthcare providers in Catalonia because it also provides the social care services for the region of Badalona and three other towns surrounding it.

Originally, in Catalonia, there was a separation between the Department of Social Welfare and Family and the Department of Health. In terms of welfare, this separation has not facilitated effective and quality care to patients who receive benefits from both types simultaneously. For this reason, BSA decided, with the support of the Badalona Council, to change the conceptual model in 2000, focusing it on the patient. This model was implemented at the operating level by transferring social services to BSA, a company originally dedicated to the provision of health services, and thus a perfect fusion between the conceptual and operational level was obtained.

Within this context, BSA launched the Care Model for Patients with Complex Chronic Conditions (MAMCC), which must be followed by all professionals from BSA when dealing with the needs of these patients, who have a high mortality rate and high average resource consumption. BSA designed a predictive model tool that allows the stratification of the population according to risk and the care needs they are likely to have in the following year. Thus, it is possible to deal with patients' needs proactively rather than simply waiting for them to go to hospital.

2. Integrated care analysis

2.1 Dimensions of integration

The merging of the older healthcare-oriented infrastructure (the Geriatric Department) dealing with all kinds of elderly typologies ranging from the healthy, the frail, the ill, the dependent or those in a late stage of life, with a Public Social Service department, puts BSA in a position to complement health-related interventions with social assistance on a level of almost unprecedented process consolidation. The Care Model for Patients with Complex Chronic Conditions (MAMCC) has a demographic focus, which has allowed BSA to organise its care units in order to provide a better service to chronic patients. With that tool, and using multi-morbidity and frailty criteria, BSA can identify the risk of each particular citizen in order to provide the best care where needed to each individual. BSA considers frailty one of the following criteria:

- Age > 85
- The patient is in the domiciliary care programme (patients that are not able to move to primary care)
- Barber test and dependent
- Polipharmacy (>10 drugs)
- Social risk
- 2 hospitalisations at the hospital or 2 hospitalisations at the social health centre, or 2 emergencies in the last year. Trauma and surgery processes are excluded.
- Disabling diseases

To study multi-morbidity, BSA has developed a model based on economic and health variables, which should take account of comorbidities, autonomy and healthcare complexity. Depending on the multi-morbidities, BSA classifies the patients into different groups so as to adapt the resources needed:

- 0) Patients without any disease; promotion and prevention
- 1) 1-2 chronic conditions; patient at risk; self-empowerment
- 2) 3-4 chronic conditions; medium complexity patient; assisted care; disease management

3) > 5 chronic conditions; high complexity patient; special care; case management

This stratification allows BSA to:

1. position the patient within the care model;
2. plan and carry out the interventions focused on identifying, preventing and treating in advance the acute episodes to avoid further hospitalisations;
3. design and implement individual integrated care plans based on the evaluation of each particular need and the general geriatric evaluation;
4. promote the autonomy of those patients as much as possible in order to maintain good quality of life;
5. coordinate the work of the interdisciplinary teams doing the interventions; and
6. guarantee and provide a continuum of services.

Therefore, the main target groups of BSA integrated services are vulnerable subgroups, especially the frail, the elderly and patients with complex illnesses, with emphasis on comorbidities and cognitive impairments. The focus of integrated services is on chronic disease management, health and social services integration and homecare management. BSA provides fully integrated services:

- i. back-office and support functions are coordinated across all units involved (functional integration);
- ii. with relations among different organisations (organisational integration) and
- iii. within different organisations (professional integration).
- iv. services are coordinated in a single/seamless process across time, place, and discipline (service/clinical integration)
- v. shared mission, work values and organisational/professional culture (normative integration).
- vi. policy and incentives are aligned at organisational level (Systemic integration).

BSA has achieved integration in terms of

- i. funding;
- ii. administrative integration;
- iii. organisational integration;
- iv. service delivery and
- v. clinical level encompassing both horizontal and vertical integration (hospital care - primary care and social care), as well as at the patient's home.

This level of integration is possible thanks to the structure of BSA, which covers the continuum of care and works across tiers of care with a multidisciplinary team of specialists, general practitioners, nurses and social workers.

2.2 Impact

It is worth pointing out that BSA is currently carrying out an evaluation which tries to link its integrated care model to health outcomes and impact. The preliminary results of the analysis reveal that there has been a reduction in the average length of hospital stay, and in the average number of bed days, and emergency visits. Furthermore, the clinical pathways developed have facilitated an improvement in the process outcomes, including compliance and adherence to the guidelines. All these impacts have improved the functional status and health outcomes of the patients and have led to a reduction in the operating cost of clinical services.

The use of EHR has facilitated the coordination between the levels of care, an improvement in the organisational processes, and the decision making process. All these

measures have led to better quality of care with greater control and better results in the target population, showing BSA to be more efficient.

2.3 Drivers and barriers

BSA is currently working as an Integrated Care Organisation with inter-professional teams across the continuum of care and an organisational structure that promotes coordination across settings and levels of care. This has facilitated the alignment of service funding and incentives, the promotion of inter-professional teams across the continuum of care, as well as a strong, focused and diverse governance in which all stakeholders are represented. The governance model includes policy leaders who provide organisational support and strong commitment and at the same time foster a cohesive culture which enables the continuum of care.

The main driver of this transformation has been the reorganisation of services (organisational innovation) to ensure that patients and their needs are at the centre of the health and social care provision. This philosophy has been pushed forward by strong organisational support (BSA managers) and policy commitment (specially from the local authorities). BSA organisational innovation has been implemented (supported) in parallel with technological innovations. The BSA EHR is a fully interoperable information system which enhances communication and information flows across the continuum of care, and supports health and social care professional practice. Finally, it is important to emphasise that the organisational innovation process engaged BSA professionals in a leading role, through the establishment of inter-professional teams across the continuum of care (GP - Specialists; health care professionals – social care professionals; doctors - nurses).

Currently there are no special national investments and funding programmes to ensure adequate resources for sustainable change and up-front costs (the most innovative initiatives are funded by EC projects). However, the fact that the BSA works as an integrated care organisation means that there are funding mechanism available to ensure equitable funding distribution for different services or levels of services. Nonetheless, the professionals interviewed recognised that lack of national investment and funding programmes limited the full potential of the initiatives, especially where this was accompanied by insufficient innovation in reimbursement models.

BSA has recently carried out a qualitative evaluation of the barriers related to remote monitoring in the context of the Home Sweet Home EU project. The main results are summarised below:

- **Cost** justification still remains the biggest barrier to deployment. Even large-scale trials such as the Whole System Demonstration in the UK, and the Renewing Health EU-funded project covering trials in nine countries have produced mixed results. Telemonitoring trials in some countries for certain chronic diseases appear to show benefits, but by no means all. However, it is also true that trials in general do not release all the financial benefits, because it is not possible to reap the benefits that accrue from organisational changes while operating both the "new" and "old" workflows.
- **Reimbursement.** Where healthcare professionals, in particular GPs, are reimbursed on the basis of face-to-face meetings, tele-monitoring increases their workload with no corresponding increase in remuneration. Deployment needs to consider the care ecosystems and their remuneration procedures in order to fully understand the complexities involved. Health professionals will be encouraged to use a technology

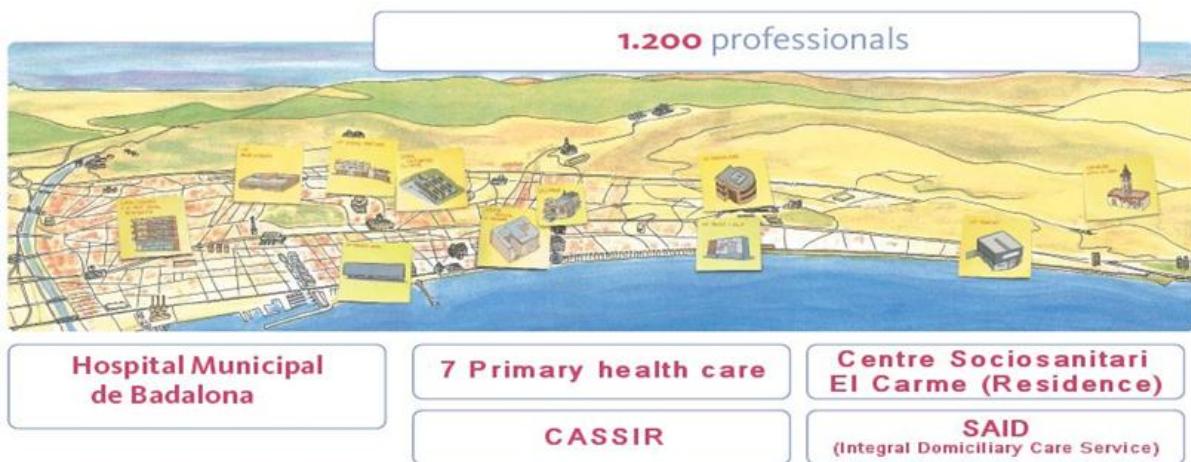
solution where the rewards package is commensurate with the effort expended. A formal Willingness To Pay (WTP) study has not been carried out; however, participants were asked how much they would pay for the solution. Results show that the amounts recorded are below the costs associated with the equipment solution. Thus, in order to ensure greater deployment of future technology solutions, national healthcare systems and/or insurance companies (and/or users) will need to subsidise these technologies for the full costs to be covered.

- **Organisational issues.** The implementation of tele-monitoring services provided by health and social care has to address the following organisation issues: (i) From an investment point of view, a joint call-centre makes sense from an economic point of view, but there are a number of points such as 24/7 monitor coverage and clear protocols for non-medical call centre staff that need to be considered; (ii) Optimising home visits: It makes no sense for both healthcare and social care staff to visit citizens if it is possible in some way for one person / organisation to undertake the tasks of both. This is particularly true if voluntary organisations are involved and (iii) Even if lack of coordination is not an obstacle to deployment, it is certainly an obstacle to achieving the best return on investment, both in terms of health benefits, and economic benefits. Where there is a lack of coordination, gaps will appear in service provision and feedback loops will be exposed. Forging a new care paradigm with the customer at the centre, enabled with technological devices, will require the bringing together of family, care professionals, technology support teams and Contact Centre personnel into a new ecosystem. This can pose a challenge where cultural or legal obstacles exist.

2.4 Organisation, health professional and patients

It is worth pointing out that BSA is an integrated private health and social care organisation committed to providing integrated services to the population covered in its area. This commitment goes beyond the boundaries of the organisation and BSA also coordinates its activities with other public providers such as Institut Català de la Salut and l'Hospital Universitari Germans Trias i Pujol.

Figure 8: BSA as Integrated Care Organisation



Source: Badalona Serveis Assistencials, 2014

The Chronicity Team is a multidisciplinary group of experts including: physicians, nurses, social workers, family workers, maintenance professionals, IT staff and administrative body (coming from primary care, hospital and intermediate care). This multidisciplinary team

enables health and social care professionals to be effectively involved in all levels of care delivery, including social care, playing an important role that could be considered as a facilitator of integrated care within BSA.

BSA is an integrated care organisation which provides the three levels of medical care and also social care services in the cities of Badalona, Montgat and Tiana. Besides, BSA can make all the information available to third party care providers who wish to access their patients' information.

The main target of the **integrated services** is **patients** who suffer from any chronic disease, live at home, autonomous or in a dependency situation, who have home care needs or are at risk of exclusion due to illness or disability of any kind, and who are part of the population within the BSA's Healthcare Area. From a social point of view, the patients are fragile people, socially or physically excluded due to illness or disability with home care needs. The BSA integrated services also support individuals (family members, and also friends, neighbours) and/or **caregivers** providing social care, health care or other types of support to the elderly person on a regular basis. Neither patients nor carers represent a major barrier to telemonitoring activities.

BSA is the provider of **social services** in the region of Badalona. The social workers are employed either by BSA or the City Council of Badalona. Besides the public body, BSA also subcontracts some of its activities to private companies to provide:

- Home Care Services (family workers),
- Meals at home,
- Laundry service,
- Clean at home,
- Telecare.

All external activities carried out by private providers are centrally managed by the Home Care Department. Furthermore, BSA also collaborates with **local associations** that provide support to patients, including volunteer organisations and private foundations.

BSA also provides health services including:

- **Primary care doctors** and nurses (ATDOM team) and case manager (nurse for complex chronic patients) from several sub-areas from BSA
- **Specialised care** health services at Badalona's Hospital
- Badalona's Hospital emergency unit staff
- **Home Care Department** (SAID), home hospitalisation team.
- **Home palliative care service** (PADES)

Besides the public body, BSA also subcontracts some of its activities such as physiotherapy at home and rehabilitation at home to private companies.

2.5 Information and Communication Technologies

Catalan healthcare is based on a multi-provider model, and integrated in a single public network. It enhances the autonomous management of each provider, as providers are free to select their information systems. However, 85% of the primary care centres have the same system (eCAP), as interoperability among systems must be guaranteed.

One of the most important goals for BSA is not only providing integrated care, which is something that has already been in place for many years now, but integrating better the telemonitoring tools in the health care services model. Telecare and telemonitoring tools

have been funded by national and international research projects as pilots so they are still not available to the whole population. Since 2010, BSA has been piloting a telemonitoring service, funded by the EU-CIP, which is currently under evaluation. The project, called Home Sweet Home³ was the BSA's first telemonitoring experience. After that, some other initiatives were tested or are currently being tested such as: ITHACA Hypertension⁴, Olfacweb⁵ and SIMAP.⁶ BSA considers these tools as useful for better monitoring patients' health conditions and empowering users to manage their own wellbeing. Beyond these telemonitoring tools, BSA has an integrated EHR system in place. The key driver for BSA to start the EHR implementation process was the organisation's distribution in the territory of Badalona. It is made up of 10 centres, spread widely around the city of Badalona (and two of them in two other small cities nearby: Montgat and Tiana). Even though distances are short, moving all the patient data in paper from one site to another on a daily basis was not secure: information was not available, it could be lost, there were a lot of duplicate tests, etc. It was not efficient in terms of quality of care and costs for both the patient and the organisation.

In 1995, BSA's strategic plan contained a specific ICT deployment plan and since then it has always been a key element when defining the organisation's strategy. At the beginning, the main objective was to solve the problems linked to that territorial distribution. In a second stage, a new key objective appeared which was to become an IT leader in the region. During the last 10 years, due to the different changes in the funding model (from closed budget to capitated), another key driver has appeared, i.e. the need to increase the efficiency and the cost-effectiveness of the services provided, in order to deliver the best services as possible with a fixed amount of money globally or per citizen. The implementation of the EHR was approached in most cases through a step-by-step method to make the process easier on IT staff and users and to minimise the disruptions in care. Regarding the vendor selection, the organisation always chose 'best-of-breed', because at that time there were no reliable monolithic systems that could fit the organisation's needs. It was done in multiple tender rounds and the solution was almost always chosen by internal user consensus. The deployment of the EHR has allowed BSA to implement an organisational and care model, which effectively makes it an integrated care organisation. BSA has achieved Stage 6 in the HIMSS Analytics Europe EMR Adoption Model (EMRAM).

Many benefits have arisen from the implementation of the EHR that are worth highlighting, especially those affecting healthcare: better coordination between the levels of care, an improvement with regard to organisational processes, and a noticeable improvement of the decision making process. All of these have led to a better quality of care with greater control and better results in the target population, making care delivery more efficient and allowing the development of new and better services.

Finally, BSA is also part of the Catalan Shared Medical Record (HC3). HC3 is the electronic record, which gathers all the documents containing relevant data and information about the status and progress of a patient during the care process, providing access in an organised manner, and always in the appropriate confidentiality and security settings, to the relevant information from the medical records of health centres from the public national health system of Catalonia (Martinez, 2013). The HC3 also makes it possible,

³ <http://apps.bsa.cat/drupal/?q=node/22>

⁴ <http://apps.bsa.cat/drupal/?q=node/12>

⁵ <http://apps.bsa.cat/drupal/?q=node/30>

⁶ <http://apps.bsa.cat/drupal/?q=node/32>

through mechanisms of interoperability and by using standards between information systems, for individual electronic medical records from health centres in the public national health system to become compatible so that one can access both the clinical and health information from a patient at the place and time it is needed. Currently, the HC3 offers the following benefits:

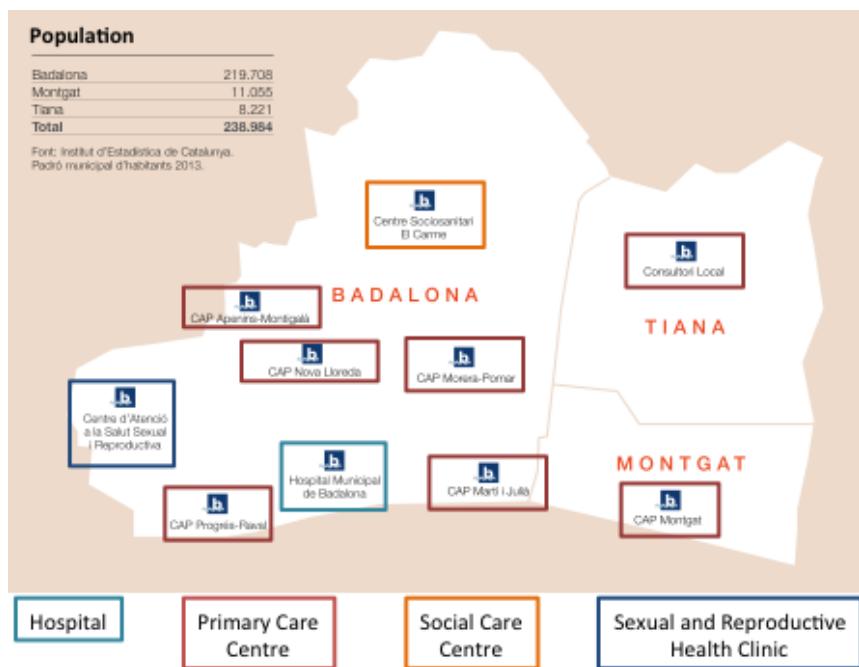
- **Citizens.** It reduces unnecessary duplication of diagnostic tests and saves the patient from having to collect the results and bring them to his/her health centre. It makes data and health information from Catalan patients accessible in a safe and confidential way through the future National Health System Electronic Medical Record. This will facilitate the provision of care to citizens when they move outside of Catalonia.
- **Professionals.** It gives healthcare professionals a tool that provides updated relevant information to help them make the best decisions regarding the diagnosis and treatment of patients. It provides a reference tool for the health care team, regardless of their geographic location and care level. They can access information from patients, which is particularly important when patients are attended by professionals from other health centres. It promotes continuity of care and improves the coordination between care levels including primary care and specialised care. It allows radiological images to be shared across several centres, a functionality that is already deployed in most of the hospitals and in all primary health care centres in the public health system. It decreases the time needed to make the radiological images available to health care professionals.
- **Health system.** It contributes to the promotion and deployment of telemedicine services, while providing data to the Personal Health Folder of the citizens of Catalonia. The experience gained in Catalonia regarding interoperability and use of standards in information systems has become a model which could be used at national and European levels.

To sum up, BSA could be considered as a front-runner organisation in the eHealth domain. It has a state-of-the-art and interoperable information system, which collects, tracks and reports activities. It also enhances communication and information flows across the continuum of care, including HER, Telemonitoring and AAL applications as pilots.

2.6 Governance

BSA as an **Integrated Care Organisation** is comprised of one Hospital, seven Primary Care centres, one Social care centre and one Sexual and Reproductive Health Clinic offering health and social care services, including home care services, to a total population of 419,797 inhabitants.

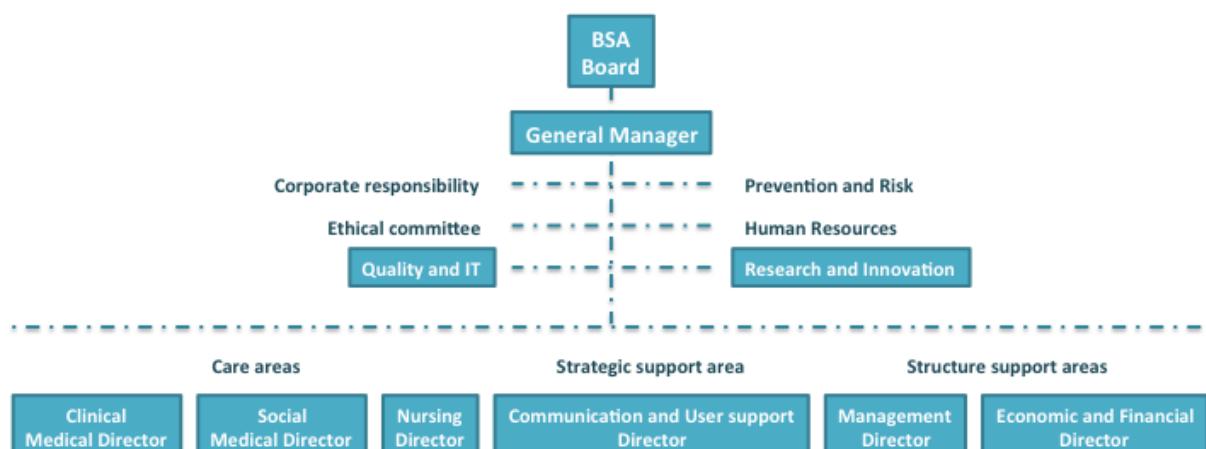
Figure 9: BSA Health and social care providers



Source: Badalona Serveis Assistencials (2013)

All these centres operate under the same governance structure led by a Board and a General Manager. This manager is responsible for three main areas (care, strategic support and structure support) and supported by a Quality and IT Department and a Research and Innovation Department. It is worth pointing out that there is no division by type of centre (hospital, primary care or social care). Instead centres cover different clinical, social and nursing areas with different types of care provision from primary care to specialist care, to social care services. Furthermore, the president of the BSA Board is the mayor of the city, which fosters an alignment between local health and social policy on the one hand and health and social care services provision on the other, which also facilitates a legal framework to coordinate health and social care services. This governance setting enables the collaboration among the different providers and professionals (health and social care professionals) to ensure the continuum of care through inter-professionals teams working together developing care pathways.

Figure 10: BSA Governance structure



Source: Author elaboration based on Badalona Serveis Assistencials (2013)

2.7 Organisational processes

A Case Management Nurse (CMN) coordinates the Care Model for Patients with Complex Chronic Conditions (MAMCC). The CMN supports patients, family and carers during the continuum of care, coordinating the other health professionals and services provision and resources. This nurse works in primary care and is able to move across the different tiers of care, including the patient's home.

Patients with complex chronic conditions can also access the programme based on their profile in the stratification tool, or on their identification by primary care or by other hospitals or social care workers. The first step, once patients are included in the programme, is to assess their needs. This assessment includes an integral geriatric evaluation and contributes to an individual plan (IP) covering: health education; self-care; clinical control of the chronic health problems; medication review and adherence and advance health care directive (living will).⁷ Furthermore, depending on the status of the patient, the following services are available:

- If the chronic condition is under control, patients are referred to the primary care centre, the social care worker and/or nursing home.
- If the chronic condition is not under control or there is an acute episode, patients are referred to a multidisciplinary unit so that their status can be assessed, including dementia or other mental disorders. They are then referred to day hospital care, to home care assistance, including home care geriatric visits or sub-acute and post-acute care units.

These organisational processes are supported in most cases by care pathways developed by inter-professional teams.

2.8 Reimbursement model and economic flow

As described in Section 1.2, the Catalan government (Generalitat de Catalunya) has developed its own organisational model based on the historical evolution of the Catalan health system, which is comprised of a mix of private and public healthcare providers.

Figure 11: Owners of healthcare facilities

	State Property or Management	Non State
Hospital care	20.18%	79.82%
Primary care	77.06%	22.94%
Mental Health care	27.79%	72.21%
Long-term health care	38.43%	61.57%

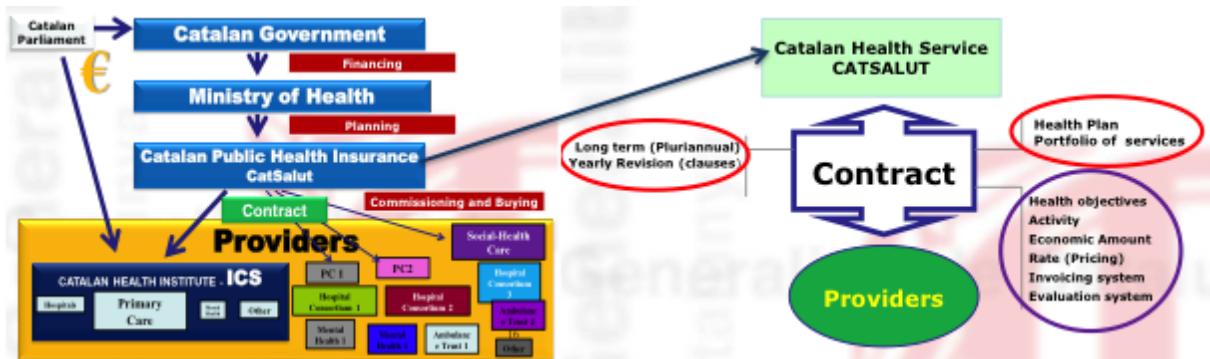
Source: Office of General Direction of Healthcare Resources. Department of Health of Catalonia

Source: Dedeu, 2013

⁷ A legal document in which a person specifies what actions should be taken for their health if they are no longer able to make decisions for themselves because of illness or incapacity.

The Catalan health system is a NHS-based system (Beveridge model) with purchaser - provider split. The following figure displays the reimbursement model of the system. The Catalan Government finances the system and the Department of Health is responsible for planning. The Catalan Health Services (CATSALUT) is in charge of the health plan and the portfolio of services. Based on population needs in each region, CATSALUT purchases health care services. The payment is based on the activities performed, especially in the case of hospitals, and in the case of primary care on the health objectives and population assigned. Social care is funded and provided by the municipalities.

Figure 12: Reimbursement model and Economic flow



Source: Dedeu, 2013

In this context, BSA is reimbursed by a risk-adjusted capitation method. This reimbursed method is based on the population covered, adjusted according to age, gender, dispersion of the population in the territory, income level and capacity to attract patients from nearby areas. Nevertheless, specialist care (hospital) is still adjusted based on activity, using a case-mix (calculating case-mix index per hospital using ICD9-CM of all discharges and DRGs) and structural cost approach (estimation of expected structural cost per discharge). This exception in the Catalan Health System has fostered the development of integrated care.

3. Transferability

All the individuals interviewed stated that the BSA case could be translated into other regions/countries with a NHS model at a medium customisation cost. This type of initiative would be more difficult to export to an insurance-based model. However if legal, organisational and institutional arrangements are developed, the BSA experience could also be translated into this type of system.

Nevertheless, it is important to emphasise that BSA is currently an **Integrated Care Organisation**, which is comprised of different types of health and social care centres under the same governance and organisational structure, sharing the same cultural values and legal framework. Therefore, in the absence of this type of organisation, the cost of transferability would be extremely high due to the fact that institutional, organisational, cultural and legal changes are essential to achieving the full integration characterising BSA.

These changes mean overcoming legal barriers (health and social care legislation), organisational barriers (horizontal integration among different primary care centres, vertical integration among hospital – primary care centres - social care centres), and institutional barriers (to create a new entity such as BSA, which has the mayor of the city

in its Board). The technology developed at BSA could be relatively easy to transfer to other health care organisations. This technological innovation, however, would not have an impact without the necessary organisational and institutional innovation.

4. Conclusions

BSA is an integrated care organisation providing integrated care across the continuum of care, including social care. BSA has all levels of care and social care within the same organisation with a state-of-the-art EHR that supports the continuum of care.

The first step was taken back in 2000, when Badalona's City council decided to outsource social care services to BSA. This fostered a new model that put citizens and patients' needs at the centre of the system. Therefore, **the initial driver of integrated care in this case was a policy commitment** towards a patient-centric model which would enable the continuum of care at a local level (municipality). This local push was also reinforced and aligned with the Catalan health policy agenda towards integrated care in Catalonia.

Since then, BSA has been reorganising health and social care services towards integrated care covering the whole population in its territory, with special emphasis on vulnerable subgroups (such as frail elderly people and those with disabilities) and patients with complex illnesses and comorbidities. The integrated care services provided include all pathologies, life-style and disease prevention with a clear focus on chronic disease management, inbound and outbound health and social services integration and home care. The reorganisation of the services included back-office and support function coordination across all units involved (functional integration), the existence of a single organisation in charge of health and social care provision (organisational integration), the development of multidisciplinary teams of health and social care professional across different tiers of care (professional integration), the development of the care pathway as a single/seamless process across time, place, and discipline (service/clinical integration), a shared mission, work values and organisational/professional culture (normative integration) and the alignment of incentives at organisational level (systemic integration).

Without any doubt, this **reorganisational process and the governance mechanism established have been the main drivers of integrated care**. Provision of services was re-organised to ensure cooperation between tiers of care and between health and social care, enabling BSA to facilitate patients' access to a care continuum with multiple points of access and with nurses playing a pivotal role (case managers). The organisational innovation in BSA has implied full integration, especially from an administrative, service delivery and clinical perspective to the extent that the current organisation chart of BSA does not differentiate between the different providers such as primary care centres, hospital or social care centres, but between care areas. This organisational structure promotes coordination across the different settings and levels of care through the establishment of inter-professional teams who operate across the continuum of care and are in charge of developing care pathways. Thus, health and social care **professionals play a leading role in facilitating integrated care deployment**.

It is worth mentioning that a technological innovation process has accompanied the reorganisational process. The current EHR is a fully interoperable information system. It enhances communication and information flows across the continuum of care not just among all BSA providers, but also with other third parties providers in and around Badalona. This implies that all health and social care professionals have access and use

intensively all the IT systems within their practice. Even though there is still room for improvement in the case of social care workers, the existence of such **interoperable information systems has fostered the full deployment of integrated care**. It is also worth noting that resistance to technology on the part of health and social care professionals and patients has not been perceived as a barrier which hampers integrated care deployment.

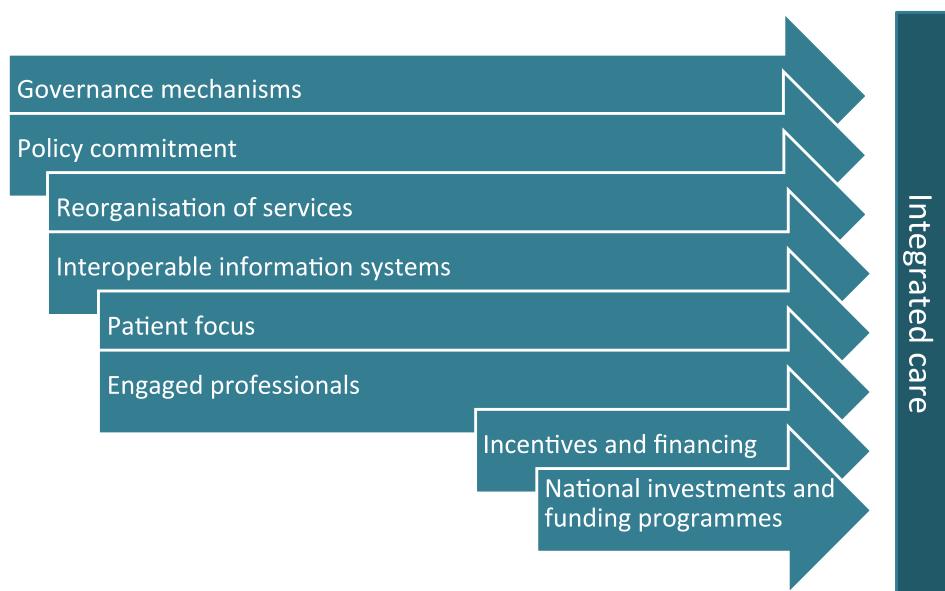
BSA has consolidated responsibilities and resources in a single organisation that delivers and pays for the entire continuum of care. In this regard, service funding and incentives are aligned to ensure equitable distribution of different services or levels of services. The **absence of major conflicts between the distribution of resources and the alignment of incentives** among primary, secondary and tertiary care and social care has facilitated integrated care deployment. However, there are still some constraints related to professionals' perception of how incentives are distributed across the organisation, because the re-organisation of the service has increased their workload.

Within this organisational context of a stand-alone governance structure which allocates the resources, including social care services resources, there was no urgent need to change the reimbursement model (the Catalan health system is an NHS-based system - Beveridge model- with purchaser/provider split) to foster integrated care. However, the fact that BSA has been included in a pilot to test a new reimbursement scheme based on a risk adjusted capitation model has been interpreted as an incentive for the BSA organisation to tune its integrated care model for providing services even more efficiently (not only among BSA providers, but also with the other third parties providers in Badalona).

As a risk-adjusted model, the gains obtained by BSA in this new reimbursement scheme due to its integrated care model, could then be distributed based on patients' needs, especially in the social care area, where the resources are scarcer. Finally, national investments and funding programmes did not play a key role in the BSA case. EU funding has been used to carry out the most innovative IT developments and as an incentive for professionals to participate in research projects.

To sum up, the following figure depicts the main facilitators. Governance and policy commitment could be considered as the main facilitators of the BSA case. These two drivers have pushed the following two: i.e. reorganisation of services and interoperable IT systems. These are followed by engaged professionals and a focus on patients' needs. Lastly, incentives and financing, and national investments and funding programmes play a minor role in this case.

Figure 13: BSA Integrated care facilitators



Source: Authors elaboration

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