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MACVIA-LR (France)

Case Study Report

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Abstract

The MACVIA-LR integrated care approach deployed in the Languedoc-Roussillon region in the South of France rests on three main initiatives that put particular emphasis on the prevention of unhealthy ageing of patients suffering from chronic conditions by implementing a series of actions that range from the early diagnosis and management of chronic respiratory diseases to the detection of un-recognised co-morbidities. The initiatives form part of a set of activities as a reference site for the European Innovation Partnership on Active and Healthy Ageing initiative in the Languedoc-Roussillon region and comprise: Integrated care pathways for airway diseases (AIRWAYS ICPs); Allergic Rhinitis and its Impact on Asthma (ARIA); and the Co-morbidity Clinics.

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 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, and define 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 public reports which discuss the role of governance, innovation and impact assessment in enabling integrated care deployment. In addition, through the qualitative analysis of twenty seven Telehealth, Telecare and Integrated Care projects implemented across twenty regions in 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 graph 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 in the field of 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

The MACVIA-LR integrated care approach deployed in the Languedoc-Roussillon region in the South of France rests on three main initiatives that put a particular emphasis on the prevention of unhealthy ageing of patients suffering from chronic conditions by implementing a series of actions that range from the early diagnosis and management of chronic respiratory diseases to the detection of un-recognised co-morbidities. The initiatives form part of a set of activities as a reference site for the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) in the Languedoc-Roussillon region and comprise: integrated care pathways for airway diseases (AIRWAYS ICPs); Allergic Rhinitis and its impact on Asthma (ARIA); and Co-morbidity Clinics.

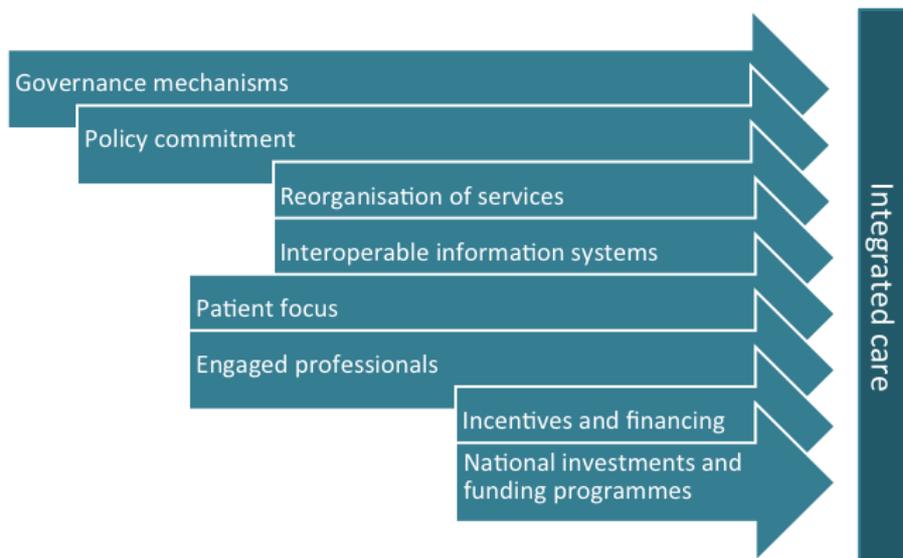
The first initiative, AIRWAYS ICPs, aims to launch a collaboration to develop multi-sectoral care pathways for chronic respiratory diseases, and to scale these up globally in accordance with the WHO Global Alliance against Chronic Respiratory Diseases (GARD). ARIA - the most widely-used guideline for allergic rhinitis and asthma comorbidity - has been implemented in the Languedoc-Roussillon region to reduce the burden of allergy and asthma across the life-cycle, allowing individuals to age more actively and healthily. Lastly, the Co-morbidity Clinics initiative comprises a pilot study, and multi-sectoral Integrated Care Pathways for chronic disease based on a co-morbidity clinic. It has been deployed in remote rural areas and aims to achieve a reduction of 20% of avoidable hospitalisations for chronic patients.

The focus of the services provided through the initiatives rests on preventive care and chronic disease management through the provision of integrated care pathways. These pathways imply a clinical integration as regards the provision of services through organisational integration, especially between primary care and hospitals, and professional integration among GPs and specialists. It establishes close cooperation between different organisational levels which facilitates the coordination of care, and improves health care processes and outcomes for patients.

MACVIA-LR has launched a series of integrated Living Labs (e.g. health and disease, health and innovation, health and autonomy) for real-life tests in an experimental environment, where users and producers can co-create innovative solutions. These Living Labs work as enablers of change by putting patients at the centre of the MACVIA-LR initiative.

All elements of the MACVIA-LR have been implemented at least in pilot studies and are now ready to be deployed in the region, particularly in more remote areas. Although an evaluation of the business case has yet to be carried out, the approach undertaken in the MACVIA-LR case seems to be a promising solution for the reduction of avoidable hospitalisations in the Languedoc-Roussillon region in the South of France.

This approach has yet to be fully exploited, however, and it remains to be seen whether it can be transferred to other contexts in France and Europe.



1 Background

1.1 France social welfare and health care services

The French health care system offers universal coverage, and all residents are entitled to access publicly-financed health care provided through non-competitive statutory health insurance (SHI) funds. Three major SHI funds cover more than 90% of French salaried employees, rural workers or self-employed. The state covers the health insurance costs of residents not eligible for SHI. The delivery of care is shared among private, fee-for-service physicians, private hospitals (both profit and non-profit making) and public hospitals. Next to the health care and social sector, the French health system also covers a third sector providing care and services to the elderly and disabled. The health system is largely regulated by the state through the Parliament, Government and Administration of Health and Social Affairs, and the SHI and to some extent by local communities at the regional level. In 2009, a regional health agency (ARS) was established to ensure that health care provision corresponds to population needs by means of improved coordination among ambulatory and hospital sectors, in line with national health expenditure objectives.

The SHI covers a broad range of services provided by GPs and specialists, but does not cover all expenditures. About 90% of the population can contract complementary or supplementary voluntary health insurance (VHI) either through employers or means-tested vouchers to cover services not addressed by the SHI. The level of both contributions made to and benefits received from each fund vary. The contracts can also differ in terms of level of coverage of the costs that patients have to bear after SHI reimbursement. In general terms, the VHI provides reimbursement for additional payments or co-payments made by patients and includes a better coverage of medical goods and services that are poorly covered by the SHI.

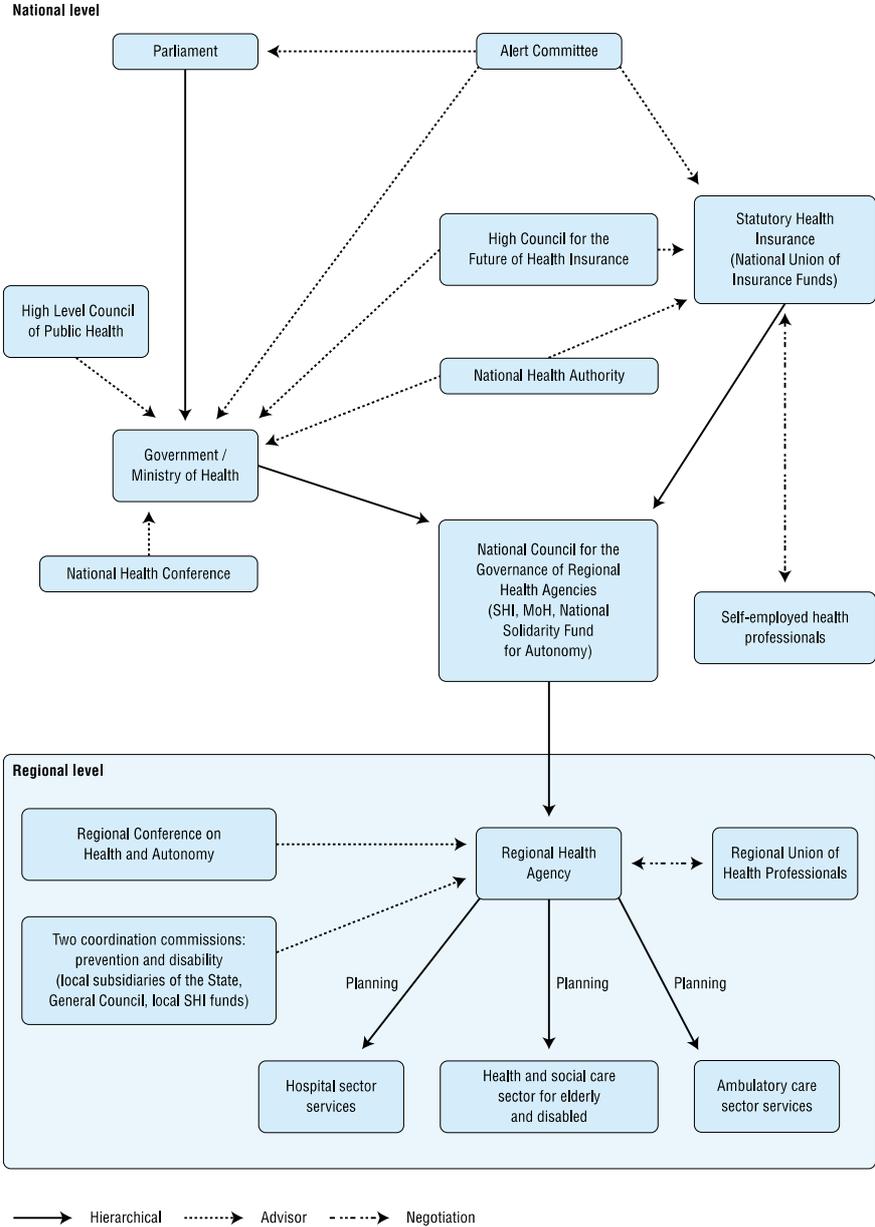
In terms of service provision, the SHI funds cover hospital care and treatment in public or private rehabilitation and outpatient care provided by GPs, specialists, dentists or midwives. These funds also cover diagnostic services, prescription of drugs, medical appliances and transport. In addition, long-term and mental health care services are partially covered by the SHI, and there is a minimum coverage of outpatient vision and dental care.

Since 2004, the Ministry of Health has defined the SHI benefit package, its price and cost-sharing levels, in cooperation with the statutory health insurers. The benefits provided under the SHI are defined, however, differently for outpatient and inpatient care. Outpatient services that are covered by the SHI are determined at national level and applied throughout France. The coverage of medical devices and drugs is determined by the Ministry of Health and the SHI determines the procedures applicable to service provision. As regards inpatient hospital care, a range of services are provided to patients under a diagnosis-related reimbursement scheme.

The SHI is financed by employer and employee payroll taxes (43%), a national earmarked income tax (33%), revenue taxes levied on tobacco and alcohol (8%), transfers from other branches (8%) and state subsidies (2%). The funds are pooled on the national level and allocated through the national budgets determined by the Parliament. Within each budget, a regional allocation is decided upon and distributed by the regional health agency. Health care costs account for about 85% of SHI expenditure, while around 15% are spent as cash benefits through daily allowances for maternity, sickness or occupational accident leave and disability pensions.

Most physicians in France work on a self-employed basis. More GPs than specialists are self-employed and most of them work in solo practices. The providers are paid by the SHI or directly by patients and the statutory tariffs are established through negotiations between providers and the SHI with prior approval from the Ministry of Health.

Figure 1: French health system characterisation



Notes: SHI: Statutory health insurance; MoH: Ministry of Health.

Source: Chevreur et al. (2010)

1.2 Languedoc-Roussillon region

The mission of the Languedoc-Roussillon region (budget of €1.2 billion, 3,200 members) encompasses education, training, economic development, long-term national and regional development, research and public health. The region has made large investments in training on health and primary prevention (e.g. a health education programme for 15-25 years olds), emphasising the role of social care. The region supports many research programmes, particularly in biosciences, and it is among the five best French centres of public/private research. Health and social equity is a key issue and the region finances a specialised care programme (“maison médicale pluridisciplinaire”) in remote rural areas, an information programme on health for the elderly and an evaluation of interoperable independent living solutions. The region is a member of the GECT Pyrénées-Méditerranée, co-manager and delegated manager of European funds and was first in launching JEREMIE (Joint European REsources for MIcro-to-medium Enterprises).

Figure 2 displays the geographical location of the Languedoc-Roussillon region.

Figure 2: The Languedoc-Roussillon region



Source: Author's elaboration.

The region covers an area of about 27,376 km² and has a population density of about 98 inhabitants per km², with a total of about 2.73 million inhabitants living in the region. The region has 132 GP's and 105 specialists, and 865 health care professionals per 1,000 inhabitants. Table 1 summarises the main socio-economic data of the Languedoc-Roussillon region.

Table 1: General information about Languedoc-Roussillon

Geographical coverage, km²	27,376
Inhabitants per km²	98
Number of inhabitants	2,727,286
Life expectancy at birth, years	81.5
Regional GDP (2012), € billion	63.9
Regional GDP per inhabitant (2012) €/inhabitants	23,566
General Practitioners /1,000 inhabitants (2010)	132
Specialists /1,000 inhabitants (2010)	105
Health care professionals / 100,000 inhabitants	865
Hospital beds (2012)	18,675 (2011)
Hospital beds/1,000 habitants (2012)	38.5

Source: INSEE, DREES, ARS

1.3 Fighting Chronic Diseases for Active and Healthy Ageing in the Languedoc-Roussillon region

MACVIA-LR has launched several initiatives as part of its activities as a reference site under the EIP on AHA in the Languedoc-Roussillon region. The case study at hand focuses on three main initiatives: integrated care pathways for airway diseases (AIRWAYS ICPs), Allergic Rhinitis and its impact on Asthma (ARIA), and the co-morbidity clinics.

The first initiative, **AIRWAYS ICPs**, aims to launch a collaborative effort to develop multi-sectoral care pathways for chronic respiratory diseases which could be scaled up globally in accordance with the WHO Global Alliance against Chronic Respiratory Diseases (GARD). This initiative includes, among others, the development of a common framework of care pathways for chronic respiratory diseases, which will facilitate comparability and trans-national initiatives, as well as the development of plans targeted at various population groups according to culture, health systems and income. At the same time, it strives to build a sentinel network for allergic diseases and asthma which could have a significant impact on the health of citizens in the short-term (e.g. reduction of morbidity, improvement of children's education and reduction of absenteeism) and the long-term (healthy ageing), while reducing the healthcare burden (e.g. emergency visits, avoidable hospitalisations, disability and costs). It could also improve quality of life by promoting active and healthy ageing.

The second initiative, **ARIA** - the most widely-used guideline for allergic rhinitis and asthma comorbidity³ - has been implemented in the Languedoc-Roussillon region with a view to reducing the burden of allergy and asthma across the individual's life-cycle thereby allowing more active and healthier ageing. This initiative includes the development of a sentinel network (MASK) to study the symptoms of patients suffering from allergic symptoms during the pollen season. It also makes them sentinels who warn of the onset and the level of severity of the pollen season. Patients are geo-localised and evaluate their

³ Bousquet J, Khaltaev N, Cruz AA, Denburg J, Fokkens WJ, Togias A, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update (in collaboration with the World Health Organization, GA(2)LEN and AllerGen). *Allergy*. 2008;63 Suppl 86:8-160.
 Brozek JL, Bousquet J, Baena-Cagnani CE, Bonini S, Canonica GW, Casale TB, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines: 2010 revision. *J Allergy Clin Immunol*. 2010;126(3):466-76.
 Bousquet J, Schunemann HJ, Samolinski B, Demoly P, Baena-Cagnani CE, Bachert C, et al. Allergic Rhinitis and its Impact on Asthma (ARIA): achievements in 10 years and future needs. *J Allergy Clin Immunol*. 2012;130(5):1049-62.

symptoms by means of the Visual Analogue Scale (VAS), using a cell phone with a touch screen, or internet. This information is coded and sent to a central database and subsequently to all patients registered in the system. A Clinical Decision Support System (CDSS) immediately proposes advice for (standardised) pharmacological treatment. This sentinel network is also supported by a network of pharmacists who have received a tool to help them give optimal advice to patients with allergic rhinitis, including diagnosis, OTC (over-the-counter) treatment and referral to a physician.⁴

Lastly, the **Co-morbidity Clinics** initiative comprises a pilot study and multi-sectoral ICPs for chronic diseases established by a co-morbidity clinic. It is being deployed in remote rural areas and aims to achieve a 20% reduction in avoidable hospitalisations for chronic patients. This intervention includes a one-day clinical assessment performed through an evidence-based list of criteria (e.g. questionnaires, examinations, biological biomarkers for chronic diseases) for: (i) the screening of co-morbidities of cardiovascular diseases (CVD), COPD or Type 2 diabetes (D2M); (ii) the prediction of their exacerbations; and (iii) the overall estimation of severity.⁵ This common list is used for all patients referred to the clinic. A mobile clinic has been set up with interoperability with the co-morbidity clinic in order to screen co-morbidities in the remote rural areas of the region.

2 Integrated care analysis

2.1 Dimensions

Although the MACVIA-LR Fighting Chronic Diseases for Active and Healthy Ageing in the Languedoc-Roussillon region initiative targets the entire population in the area, the three initiatives outlined above place a particular emphasis on the prevention of unhealthy ageing of patients suffering from a chronic condition, including patients with complex illness, by implementing a series of actions ranging from early diagnosis and management of chronic respiratory diseases to the detection of un-recognised co-morbidities.

The focus of the services rests on preventive care and chronic disease management through integrated care pathways. These pathways imply a clinical integration as regards the provision of services through organisational integration, especially between primary care and hospitals, as well as professional integration among GPs and specialists. Therefore it involves the collaboration of different organisations at different levels. This in turn means that vertical integration is also achieved, as providers work together to facilitate the coordination of care, and improve health care processes and outcomes for patients.

2.2 Impact

All elements of the MACVIA-LR have been implemented at least in pilot studies and are now ready to be deployed in the region, particularly in more remote areas. However, the business case has not yet been evaluated. Nevertheless, a positive outcome can be expected, since MACVIA-LR aims to reduce avoidable hospitalisations in the region. This

⁴ ARIA in the pharmacy: management of allergic rhinitis symptoms in the pharmacy. Allergic rhinitis and its impact on asthma. *Allergy*. 2004;59(4):373-87.

⁵ Bousquet J, Jorgensen C, Dauzat M, Cesario A, Camuzat T, Bourret R, et al. System Medicine Approaches for the Definition of Complex Phenotypes in Chronic Diseases and Ageing. From Concept to Implementation and Policies. *Curr Pharm Des*. 2014.

indicator can be easily measured and a baseline has already been obtained. Other indicators include healthy life years (for which a tool is currently under development for different regions including Languedoc-Roussillon), and health outcomes such as quality-of-life and frailty.

2.3 Drivers and barriers

All stakeholders operating within the Languedoc-Roussillon region are involved in the MACVIA-LR, which includes the different actors of the French Health System (e.g. ARS, CPAM⁶, and CARSAT⁷). There is wide consensus among these actors about the urgent need to change the management of the health system for chronic diseases. More specifically they acknowledge the importance of primary care as the front line for optimal care provision on the basis of adequate public health strategies and the development of IT systems which support integrated care and shared decision-making, taking account of both patients' values and preferences as well as inter-professional collaboration. This shared vision drives the MACVIA-LR initiatives for more integrated care services provision.

It is worth mentioning that most of the components mentioned above already exist in Languedoc-Roussillon, but that the integrated care dimension has not been tested in the rest of France. In this respect, MACVIA-LR has launched a series of integrated Living Labs (e.g. on health and disease, health and innovation, health and autonomy) for real-life testing in an experimental environment, where users and producers can co-create innovative solutions. These Living Labs work as enablers of change by putting patients at the centre of the MACVIA-LR initiative. However, this novel approach is not yet fully understood by all actors, which makes it highly important to disseminate the information on a local level and to explain the potential benefits of the approach.

An economic evaluation of the initiatives is essential and MACVIA-LR represents a completely new approach in this respect. Single components, including services provided by the novel co-morbidity clinic, are fully reimbursed, but the full MACVIA-LR approach is not. This could hamper integrated care development and consequently have detrimental effects. The Sécurité Sociale is still investigating how to reimburse the programme, as it is relatively easy to assess the cost-benefit interventions for a single disease but far more difficult to assess the benefits of tackling co-morbidities, which are not always easy to demonstrate from a clinical point of view.

As a consequence, this could represent a barrier for further deployment. Nevertheless, it is difficult to discuss policy support for the deployment of the initiative and the potential resistance from care managers, especially at this stage. It is evident that in the Montpellier CHRU case, the programme is fully supported by care managers. In this case an attempt was made to re-organise the service with a minor increase in the workload of professionals, including the social care workers, who have shown no resistance to these changes. However, incentives to foster inter-professional collaboration, targeting health professionals who recognise the importance of the initiative, are currently being discussed.

To the best of our knowledge, there are no well-defined national investments and funding programmes to ensure adequate resources for sustainable change and up-front costs. Neither are there adequate funding mechanisms to ensure an equitable funding distribution

⁶ Caisse Primaire d'Assurance Maladie

⁷ Caisse d'Assurance Retraite et de la Santé Au Travail

for different services or levels of services. The different stakeholders could perceive this situation as an inhibitor of integrated care.

2.4 Organisation, health professionals and patients

MACVIA-LR is based on a public-private partnership that includes all health professionals (e.g. physicians, pharmacists, physiotherapists, nurses, others) and numerous patients' organisations. The following table shows the stakeholders involved:

Table 2: MACVIA-LR stakeholders

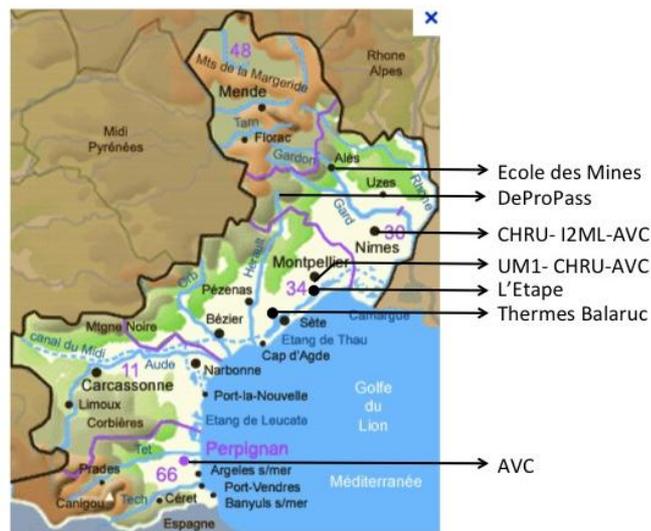
	Acronym	Organisation (French)	Organisation (English)
Region	CR-LR	Conseil Régional Languedoc-Roussillon	Regional Council Languedoc-Roussillon
Department		Conseil Général Hérault (34)	General Council Hérault state
		Conseil Général Gard (30)	General Council Gard state
City		Montpellier Agglomération	Montpellier area
		Nîmes Agglomération	Nîmes area
		Lattes	
		Balaruc les Bains	
		Juvignac	
		Lodève	
		Prades-le-Lez	
Teaching and research	UM1, UM2, UM3	Université Montpellier 1,2,3	University of Montpellier 1,2,3
	Unîmes	Université de Nîmes	University of Nîmes
		Ecole des Mines d'Alès	Engineering school of Alès
Teaching hospitals		CHRU Montpellier	University hospital of Montpellier
		CHU Nîmes	University hospital of Nîmes
National or regional agencies	ANR	Agence Nationale de la Recherche	National Research Agency
	ARS	Agence Régionale de Santé	Regional Health Agency
	CARSAT	Caisse d'assurance retraite et de la santé au travail	Retirement and occupational health insurance agency
	CNSA	Caisse Nationale de Solidarité pour l'Autonomie	<i>National Solidarity Fund for Autonomy</i>
	CPAM	Caisse Primaire d'Assurance Maladie	Regional health insurance agency
	HAS	Haute Autorité de Santé	National Authority for Health
	INRS	Institut National de Recherche et de Sécurité, pour la prévention des accidents du travail et des maladies professionnelles	
	CCAS	Centre d'Action Sociale	Social and welfare community centre

Source: Authors elaboration

It is worth noting that the initiative adopted a patient-centred philosophy that strongly focuses on patients' needs. As a result, 45,000 patients attend the Thermes de Balaruc every year and more than 1,000 patients and caregivers attend the L'Etape Living Lab.

MACVIA-LR has been initiated in different areas of the region and is gradually being deployed in the entire region that stretches from the Provence-Alpes-Côte d'Azur, Rhône-Alpes, Auvergne, Midi-Pyrénées on the one side, and Spain, Andorra and the Mediterranean Sea on the other side. Figure 3 depicts the main areas of implementation of the MACVIA-LR.

Figure 3: Areas of implementation of MACVIA-LR



Source: Author's elaboration.

2.5 Information and Communication Technologies

The IT system used in the CHRU Montpellier to develop the co-morbidity clinic has been described in detail by Buorett and Bousquet (2013).⁸ The APS uses DXCare[®],⁹ the hospital information system used by all members of the Montpellier hospital. A wide variety of information is managed with this system and IPSoins[®], which carries out the data collection and record acquisition, stands out as regards the quality and diversity of the information it manages. IPSoins[®] provides hospital health care professionals with a single tool that can handle letters, administrative information, imaging and test requests/results, specialist medical files, oral recordings, databases, and more. Within the framework of research undertaken in the area, innovative algorithms and statistical models are being developed, tested and released on to the market. The aim is to explore a large amount of data that is heterogeneous and diverse but can be combined in order to search for chronic diseases. As shown in its standard catalogue of services and products, IPSoins[®] aims to provide a large number of “career” modules including medical, surgical and psychiatric specialities, obstetrics and follow-up care. In case more data is needed, or specific needs are not covered by the standard modules, such as the management of a clinical study, an extension module using questionnaires is available. Constructed with the help of ICT, IPSoins[®] is secure and readily accessible to the other actors involved in the follow-up of patients. Through telemedicine, it is possible for private health care professionals (e.g. private doctors and professionals from the medico-social sector) to access parts of the medical files from a distance when following-up on patients. Access is highly secure and

⁸ Boure R, Bousquet J. An integrated approach to telemonitoring noncommunicable diseases: best practice from the European innovation partnership on active and healthy ageing. *World Hosp Health Serv.* 2013;49(3):25-8.

⁹ MedaSys, and Orange business service, <http://www.orange-business.com>

already available to sites outside of the premises of the Teaching Hospital of Montpellier. A fine-tuned, specific and precise management mechanism allows administration of rights in compliance with the statutory and legal regulations regarding access to patient data. IPSoins® is currently being deployed and will be evaluated in a city hospital in Sète.

2.6 Governance

The MACVIA-LR initiative is led by the *Fondation des Maladies Chroniques - Languedoc-Roussillon* MACVIA. MACVIA-LR needed the foundation, which was identified as the most appropriate for the task, to ensure a stable structure. The foundation abides by the rules of the *Fondations Partenariales*,¹⁰ the founding members of which are the University Montpellier 1, the University hospitals of Montpellier and Nîmes and the Région Languedoc-Roussillon. The *Fondations Partenariales* can also participate in international cooperation frameworks. The MACVIA-LR governance includes founding members of the Fondation and the MACVIA-LR Executive Committee.

Table 3: MACVIA-LR governance

	Name	Organisation
Coordinator	Jean Bousquet	University Montpellier 1, University Hospital, Montpellier
Leadership	Christian Bourquin	President, Région Languedoc-Roussillon
	Philippe Augé	President, University Montpellier 1
	Philippe Domy	Director General, University Hospital, Montpellier
	Jean-Olivier Arnaud	(former) Director General, University Hospital, Nîmes
	Jacques Bringer	Dean, Medical School, Montpellier-Nîmes
Executive Committee	Nicolas Best	Deputy General Manager, University Hospital, Nîmes
	Rodolphe Bourret	Deputy General Manager, University Hospital, Montpellier
	Thierry Camuzat	Deputy General Manager, Region Languedoc-Roussillon
	Jean-Emmanuel de la Coussaye	President, CME, University Hospital, Nîmes
	Olivier Jonquet	President, CME, University Hospital, Montpellier
	Jacques Mercier	Vice president, University Montpellier 1
	Jean-Marie Robine	Inserm
Project manager	Anna Bedbrook	University Hospital, Montpellier

Source: Authors elaboration

The foundation has a strongly focused and diverse governance structure, in which all stakeholders are represented. This promotes coordination across the different health providers and levels of care, and includes a legal framework for liability issues.

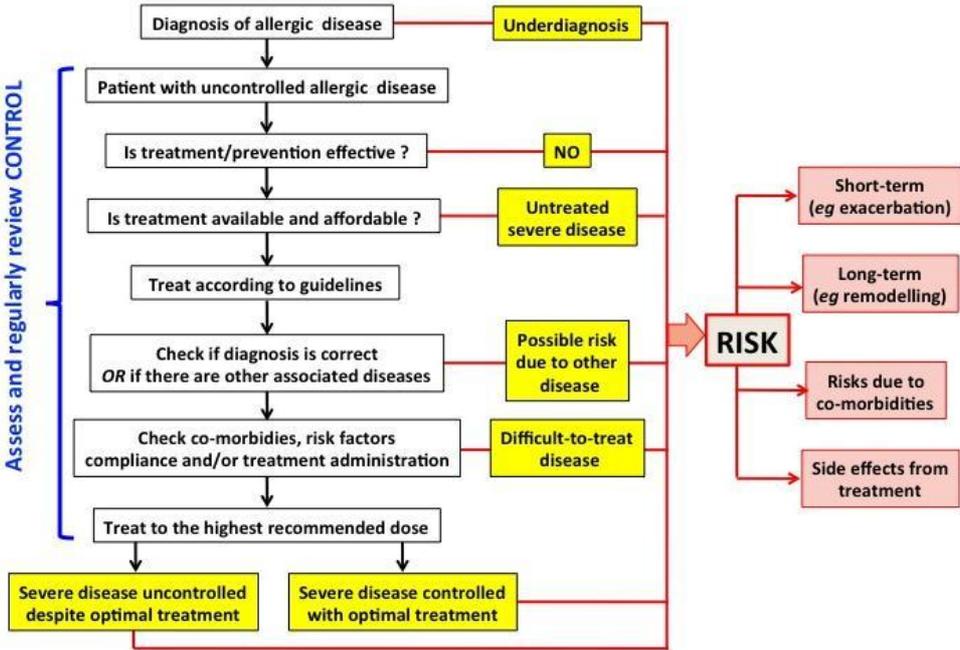
2.7 Organisational processes

The MACVIA-LR organisational process has been designed as a Living Lab, which carries out the following activities: (1) co-creation: co-design by users and producers; (2) exploration: discovering emerging usages, behaviours and market opportunities; (3) experimentation: implementing live scenarios within communities of users and (4) evaluation: assessment of concepts, products and services according to socio ergonomic, socio-cognitive and socio-economic criteria. These activities have been undertaken in order to define the three interventions: AIRWAYS ICPs, ARIA and Co-morbidity clinics.

¹⁰ (Article L. L719-13 du code de l'éducation <http://www.universites-numeriques.fr>) which follow the *Code de l'Education* (Law n°87-571 of 23 July 1987, Decree n°91-1005 of 30 September 1991 to apply Law n°90-559 of 4 July 1990 and modify Law n°87-571 of 23 July 1987).

The following figure depicts the clinical pathway for allergic disease followed by AIRWAYS ICPs and ARIA. Specialists within the hospitals currently use this pathway to assess and regularly review the status of patients with allergic diseases. In addition, a group of primary care physicians has been included in a pilot to test how this instrument could be applied in primary care and how this tool can facilitate integration between the different tiers of care.¹¹

Figure 4: Uniform approach to the severity of allergic diseases

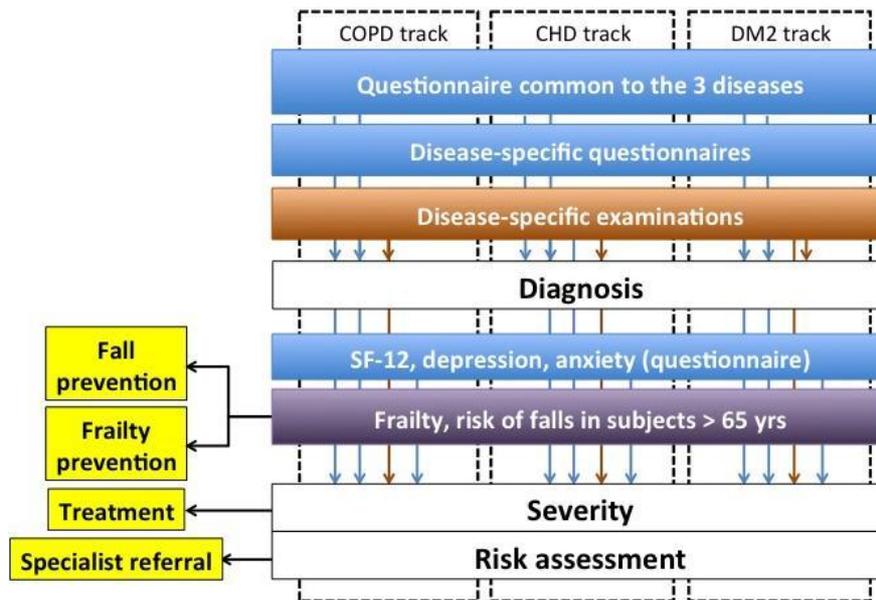


Source: Bousquet et al. (2012)

In the case of the co-morbidity clinics, the list of evidence-based criteria included in the one-day clinical programme was developed using a Delphi process, in which all the professionals involved participated. This list includes the criteria for screening CVD, COPD or D2M comorbidities, the prediction of their exacerbations and the overall assessment of severity, and a risk assessment. The process is initiated by a primary care physician who refers patients to the hospital. After a co-morbidity evaluation, the patient is followed up in primary care. This process is supported by the IPSoins® technology (see Section 2.5).

¹¹ Bousquet J, Mantzouranis E, Cruz AA, Ait-Khaled N, Baena-Cagnani CE, Bleecker ER, et al. Uniform definition of asthma severity, control, and exacerbations: document presented for the World Health Organization Consultation on Severe Asthma. J Allergy Clin Immunol. 2010;126(5):926-38.

Figure 5: Chronic disease clinic to assess co-morbidities



Source: Bousquet et al³.

2.8 Reimbursement model and economic flow

The individual components of the project are fully funded by the French social security system. However, the integration of MACVIA-LR in the French health system is still being discussed, so a full description of the reimbursement model and economic flow cannot be provided yet.

3 Transferability

The group in Montpellier has wide experience in transferability, since the ARIA Guidelines have been translated into 52 languages and used in 67 countries. Moreover, several governments in Europe and elsewhere have approved these guidelines. Jean Bousquet has been the chair of the Global Alliance against Chronic Diseases of the WHO for a period of 8 years and has helped, together with the Ministers of Health, to deploy a GARD programme in several countries.¹² In this regard, it is important to note that transferability is only achieved if there is an appropriate legal framework approved by the Minister of Health or the relevant authorities in each country. Once such a legal framework is developed, institutional and organisational barriers can be managed.

In this regard, AIRWAYS ICPs has already been approved by 6 Commitments for Action, 13 EIP on AHA Reference Sites, NHS England and Scotland, 6 national coordinations (Portugal, Poland, Lithuania, Czech Republic, Italy, Turkey) and governments, the most important chronic respiratory disease patients' association in Europe (EFA), as well as by major scientific societies (EAACI, ERS). It is a WHO GARD research demonstration project. Table 3 provides a list of the members of the Airways ICPs.

¹² Yorgancioglu A, Cruz AA, Bousquet J, Khaltayev N, Mendis S, Chuchalin A, et al. The Global Alliance against Respiratory Diseases (GARD) Country Report. Primary care respiratory journal : journal of the General Practice Airways Group. 2014;23(1):98-101.

Table 3: Members of AIRWAYS ICPs

	Organisation	Member
EIP on AHA Commitment for action	Région LR (France) FILHA (Finland) GARD Turkey Norway Portugal Warsaw region (Poland) Eurobiomed (France)	J Bousquet, P Demoly T Haahtela, T Vasankari A Yorgancioglu KH Carlsen, KC Lodrup Carlsen C Barbara, E Melo Gomes B Samolinski C Royère
EIP on AHA reference sites	Athens (Greece) Aura Andalucia (Spain) Basque Country (Spain) Campania (Italy) Coimbra (Portugal) Emilia Romania (Italy) North England (UK) Northern Ireland (UK) Polibienestar (Spain) Porto Age (Portugal) Scotland (UK) Southern Denmark (DK) Valencia (Spain)	T Vontetsianos E de Manuel Keenoy G Iaccarino A Todo Bom A Addis N Wilson J Farrell F Rodenas J Fonseca G Crooks, D Henderson L Beck J Redon
EU regions	Wallonie (Belgium)	V Tellier
National coordinations	Czech Republic Lithuania Romania Serbia Slovenia	V Kolek A Valiulis F Mihaltan, I Agache B Milenkovic M Zidarn
European patients' organisations	EFA (European Federation of Allergy and Airways Diseases patient's association)	S Palkonen
European scientific societies	EACI (European Academy of Allergy and Clinical Immunology) ERS (European Respiratory Society) ERS (European Rhinology Society) EAP-UEMS (European Academy of Paediatrics) IPCRG (International Primary Care Respiratory Group)	NG Papadopoulos E Bel WJ Fokkens A Valiulis NH Chavannes
WHO GARD		N Khaltaev (Switzerland) AA Cruz (Brazil)
ARIA	Argentina Belgium Canada Cyprus France Germany Italy Japan UK	CE Baena Cagnani C Bachert HJ Schunemann A Neou I Momas T Zuberbier GW Canonica K Ohta D Price, D Ryan

4 Conclusion

The MACVIA-LR case has launched several initiatives as part of its activities as a reference site under the European Innovation Partnership on Active and Healthy Ageing built around chronic diseases, ageing and handicaps. The vision behind the MACVIA-LR initiative rests on the prevention and management of chronic diseases as an essential component for the promotion of active and healthy ageing, while achieving a reduction of chronic conditions. The main objective of MACVIA-LR is to develop innovative solutions for a network of Living Labs in order to improve the care processes for patients affected by chronic disease conditions in the Languedoc-Roussillon area and to scale up the innovative solutions within this framework for the benefit of patients and health care actors.

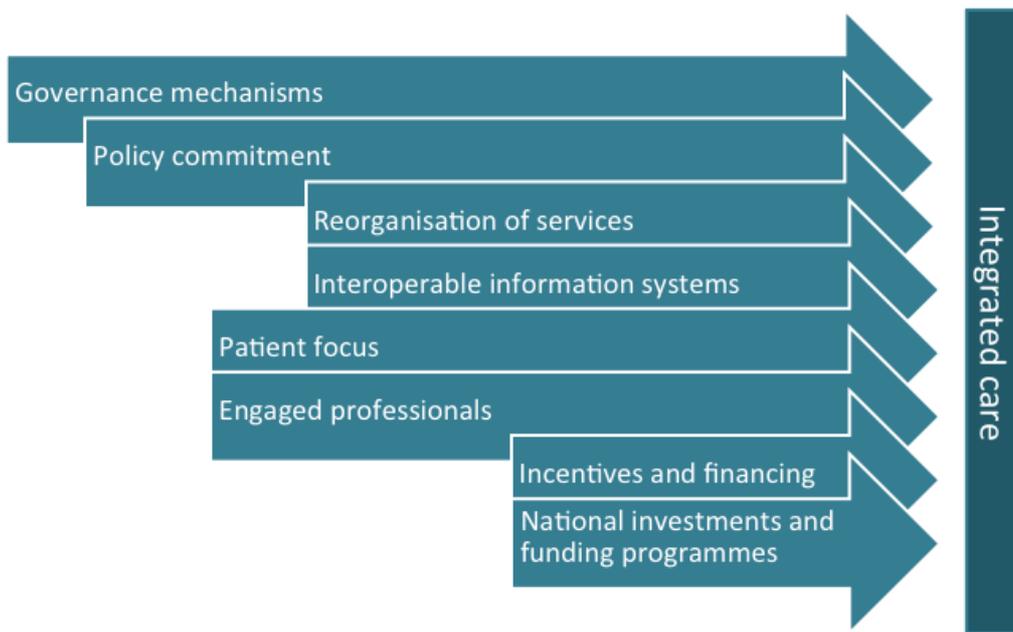
The three main initiatives of the MACVIA-LR deployed in the Languedoc-Roussillon region comprise the Integrated Care Pathways for Airway Diseases (AIRWAYS ICPs), Allergic Rhinitis and its Impact on Asthma (ARIA) and Co-morbidity Clinics. Despite the fact that the MACVIA-LR project targets the population in the region in its entirety, the three initiatives place particular emphasis on the prevention of unhealthy ageing among patients suffering from chronic conditions, including those with complex illnesses, by implementing a series of actions ranging from the early diagnosis and management of chronic respiratory diseases to the detection of un-recognised co-morbidities.

The MACVIA-LR project is characterised not only by its efforts to improve care processes through the integration of care services, but also by a strong political commitment. It was successful in engaging all stakeholders involved in the health care processes, ranging from public and private bodies to patients and policy makers.

MACVIA-LR is an ambitious, but feasible project, which was drawn up under the leadership of the President of the Languedoc-Roussillon region. It is expected that the initiative will reach its goal of reducing avoidable hospitalisations for chronic diseases by 20%, while boosting the economic growth of the region and scaling up its activities to cover the entire country, the EU and other regions of the world. However, a major barrier to full exploitation of the approach is the reimbursement processes that are still subject to evaluation. This could potentially hamper wider implementation of the approach given the potential resistance from stakeholders involved, despite the consensus among them about the urgent need to change the management of the health system for chronic diseases. Given the novelty of the approach and its current stage of deployment, it remains to be seen whether full implementation can be achieved in the future and whether it can be applied to other contexts.

Undoubtedly, the governance mechanism can be considered as the main facilitator of integrated care in the MACVIA-LR case. The *Fondation des Maladies Chroniques - Languedoc-Roussillon* has been established as the main tool to foster integrated care in the Region with the support of the Regional Government. The foundation brings together all the relevant French health system stakeholders at regional level and thereby facilitates the diffusion of the innovation processes established. In addition, the foundation has adopted the Living Lab methodology as a way of engaging health professionals and patients in the design of integrated care solutions, and it considers both organisational innovation and technological innovation. Lastly, incentives, financing mechanisms, national investments and funding programmes could be perceived as barriers that must be overcome if integrated care is to be fully deployed.

Figure 6: MACVIA-LR integrated care facilitators



Source: Author's elaboration.

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