

Advice on unmet healthcare infrastructure needs

REGIONE TOSCANA

Prepared by: **Prof Milena Vainieri**, in collaboration with and Dr Ylenia Sacco Dr Francesca Ferrè

EXPERT CONTRACT NUMBER – 2020CE16BAT065

AMI expert reference: REGIO 2020-0447

First submission: 23rd January 2021

Revision received from Regional Authority: none.

Final submission after revision, update of data to 31st December 2020 and English proofreading: 30th April 2021

Table of Contents

Advice on unmet healthcare infrastructure needs	1
REGIONE TOSCANA	1
1. Organisation of the regional healthcare system	5
2. How to identify regional unmet needs	6
POPULATION HEALTH STATUS	6
NON-HEALTHCARE DETERMINANTS OF HEALTH	7
HEALTHCARE SYSTEM DESIGN AND CONTEXT	8
3. Healthcare expenditure	8
4. Physical infrastructure and resources	9
4.1. <i>Physical infrastructure</i>	9
4.2. <i>Capital investment (fixed asset and equipment)</i>	10
5. ICT & e-Health	12
5.1. <i>Digital healthcare: the regional framework</i>	12
5.2 <i>Implementation of digital solutions at the regional level</i>	14
I) FSE – Fascicolo Sanitario Elettronico.....	14
II) Telemedicine and other IT solutions	16
III) Digital health services	19
HEALTHCARE PERFORMANCE	21
6. Public health/Prevention	21
7. Hospital and Emergency care	22
8. Territorial care: primary care, community care and long-term-care	26
9. Care pathways: chronic patients	29

Summary

This document provides a picture of the regional performance of Toscana before the COVID-19 outbreak and on the current situation in terms of investment plans put forward by the regional government to strengthen access to and provision of healthcare services and to reinforce the resilience of the health system in coping with COVID-19.

The summary table below provides the relative performance of Toscana in different care settings. For each care setting we show the priority of investment needed: high, medium, and low in accordance with relatively low, medium or high performance determined using the indicators observed and documents analysed. Hence, the three levels of priority provide the level of expected attention that should be directed to each area/care setting.

	Level of attention for expected investment
Fixed tangible assets (obsolescence)	Medium/high
Capital investment (use of framework agreement)	Medium
Population health status	Low
Healthy life style	Low
Public health	Medium
Acute care	Low
Primary and community care	Medium
Long term care	High
Chronic path	Medium
ICT solutions	Medium/low
ehealth services	Medium

From these priorities we identified a list of investments needed gathered from the analysis of evidence and official documents as well as through consultation with regional policymakers and experts¹. This list should not be considered **a ranking of the strategies** because often each area needing investment

¹ We thank Dr. Angelita Luciani (*Autorità di gestione POR FESR*), Dr Enrico Mayrhofer (*Ufficio di collegamento con le Istituzioni Ue - EU Liason Office*), Dr Paolo Tedeschi (*Dirigente presidenza Regione Toscana e Rappresentante delle Regioni al Comitato Interministeriale per l'attrazione degli investimenti esteri*) and Ing. Andrea Belardinelli (*Responsabile sanità digitale e innovazione Regione Toscana*).

is interdependent on the others, so it aims to provide an indicative **trend for supporting resource allocation** and the **planning of related interventions**.

In particular, Toscana needs to invest in healthcare infrastructure focussing on:

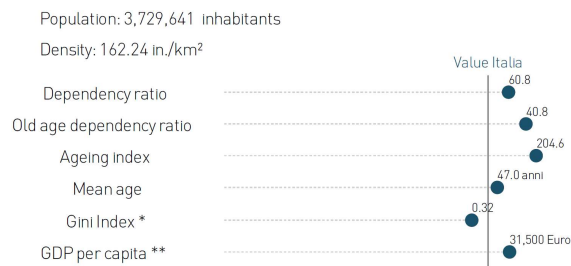
- Supporting the new generation of the regional **health information systems** (from real-time analyses put in place during COVID-19 to the use of the recent investment in SAP) **and governance tools** (including new regulatory tools) for monitoring and managing intermediate and transitional care, long-term care, end of life care, and public health.
- **Training, recruitment, and retention of the health workforce**. Strengthening this strategy has been considered essential to cope with the pandemic. In this case, training refers to the prevention, contagion containment, and treatment of COVID-19 and epidemic preparedness in general. However, **training is also critical beyond this epidemic**. In particular, after the new injection of healthcare personnel during the pandemic it is important to plan for the new normality and the reorganisation of all these people within the healthcare system.
- **Strengthening community care** to assure continuity of care especially for chronic patients. Investment in fixed assets for *Case della Salute* should continue. A renovation of the chronic management programme is needed to consider multimorbidity instead of single diseases. Finally, Toscana needs to improve the quality and suitability of care in the **mental health pathway**.
- **Renovating the equipment and fixed assets** of public providers, the obsolescence rate of which is around 55% for the fixed assets and 87% for the equipment. Based on the Assets and Liability statement of 2018, the acquisition value of equipment is about €1.6 billion. About €1.4 billion is needed to replace the equipment.
- **Further deployment of telemedicine and digital solutions and the integration of them starting with the current state of the art**. The new telemedicine and digital solutions introduced for the management of the COVID-19 outbreak should be supported in terms of investment for ‘reuse’ and development beyond the pandemic to become ordinary services of the NHS, beyond their use in emergencies and as piloting tools².
- **Digital literacy and skills**. Investment is needed for the training of healthcare professionals in using technology (particularly in the case of GPs/paediatricians who show the lowest usage level of the FSE: the implementation level of FSE is complete [100%] but the ‘usage’ in terms of ‘feeding’ by medical personnel is low [3%]). Specific action and communication campaigns should be put in place by the regional government to increase digital literacy among different target users (citizens, GPs, and health operators). In this regard, agreements among GPs and healthcare organisations for training sessions to use common digital tools should be incentivised and supported.

The table below shows the types of investment required to close the gap of the unmet needs identified. In particular, tangible investment are related to the acquisition or renovation of equipment, other fixed assets and information systems. Intangible investment relates to the training, incentives provided to personnel, and the software solutions including new data information flows. New technologies

² e.g. Supporting new telemedicine projects for the monitoring and treatment of elderly patients affected by chronic diseases is appropriate for long-term investment as in the case of the project ‘A casa in buona salute’ approved in August 2020 by the regional government. <https://www.toscana-notizie.it/-/a-casa-in-buona-compagnia-al-via-il-progetto-sull-assistenza-alle-persone-con-cronicit%C3%A0>

include investment in research and advanced information technology systems. Organisational investment are related to regulations, use of monitoring systems and classification systems, financial reimbursement and so on.

Unmet needs	Tangible investment	Intangible investment	New Technology investment	Organizational investment
Supporting the new generation of health information system		✓	✓	✓
Renovating the equipment and fixed assets	✓			✓
Strengthening community care	✓			✓
Training, recruitment, and retention of the health workforce		✓		
Further deployment of telemedicine and digital solutions	✓	✓	✓	✓
Digital literacy and skills		✓		✓



Source: ISTAT 2019 <http://demo.istat.it> * Source: Istat, Indagine Euisic 2017 ** Source: Eurostat 2018

Figure 1: Socio-demographic Indicators

1. Organisation of the regional healthcare system

Since the 1 January 2016 (regional Law n.84 of 28/12/2015) Toscana reorganised the healthcare system through a process of mergers, moving from 12 to three Local Health Authorities (LHAs). Hence, the current system is made up of three LHAs, four university hospitals, one focus autonomous hospital and an oncological research centre (ISPRO, *Istituto per lo studio, la prevenzione e la rete oncologica*) that supports the governance network of the oncological care pathway and oncological prevention. In addition, there are other regional centres supporting regional governance (regional law 40/2005): (i) regional agencies for epidemiological surveillance (*Agenzia sanitaria Regionale*, ARS Toscana); (ii) a regional committee for bioethics and ethics committees; (iii) a regional public body in charge of procurement, logistics, recruitment procedures as well as ICT services for all the local health authorities and university hospitals (ESTAR, *Ente di Supporto Tecnico Amministrativo*); (iv) several centres supporting clinical governance coordinated by the regional clinical governance centre (*Organismo Toscana Governo Clinico*): the Tuscan transplant centre (*Organizzazione toscana trapianti*), the Tuscan blood centre (*Centro regionale sangue*), a clinical risk management centre (*Centro regionale per la gestione del rischio clinico e la sicurezza del paziente*), a complementary alternative medicine centre (*Centro regionale per la medicina integrata*), a regional centre to reduce professional conflicts (*Centro regionale di riferimento per le criticità relazionali*), a regional reference centre for external quality control (*Centro regionale di riferimento per la verifica esterna di qualità*), and the gender medicine centre (*Centro di coordinamento regionale per la salute e la medicina di genere*).

Toscana has an integrated system where hospitals and territorial care are provided by the Local Health Authorities (LHAs), while the university hospitals provide hospital care. A peculiar aspect of Toscana is the institution of Public Health Consortia (*Società della Salute*) which are partnerships between the municipalities and the LHAs to manage the integration of social and health services at the district level (regional law 40/2005). There are 15 *Società della Salute* and 11 districts that run their activities in the same way as other districts in the rest of Italy. *Società della Salute* differ from *Case della Salute*. The former refers to new corporations jointly made up by Local Health Authorities and municipalities to provide social and health activities; the latter refers to facilities where General Practitioners (GPs) work and that deliver (mainly) primary healthcare services.

Like other Italian regions, Toscana is characterised by a quasi-open market healthcare system in which citizens can freely choose the provider, regardless of its ownership (private for profit, private not-for-profit, or public). All hospitals are public, few beds are managed by private centres which often provide the rehabilitation services. The Regional Health System (RHS) employs approximately 51,100 employees, including 12,700 specialist physicians, and about 3,500 primary care workers including GPs, paediatricians, and on-call medical services (*medici di continuità assistenziale*).

The Regional Social Health Plan defines strategies for the development and management of the social and healthcare system. The latest available is the 2018–2020 Plan. In addition, the region annually provides the different actors involved in the RHS with objectives to focus on.

2. How to identify unmet regional needs

To facilitate the identification of regional healthcare needs we refer to the conceptual framework proposed in deliverable 1 that focusses on the quality of healthcare using a broader perspective on health and its other determinants in order to capture population health. Indeed, health and healthcare performance is determined by multiple interdependent factors, including **population health status** (health conditions, health functions and quality of life, life expectancy and well-being, mortality), **non-healthcare determinants of health** (behaviour and lifestyle), and **healthcare performance** (acute and emergency care, primary care, community and long-term care, as well as healthcare pathways). Finally, we focussed on **healthcare system design and context** (physical and human resources, ICT and health information system, as well as governance structure). For all these dimensions, we identify significant indicators available in national statistics and represent them with infographics that highlight information for benchmarking against the Italian average and national distribution (minimum, maximum, and the inter-quartile range are shown in dark grey). Data refer to the last available on 31st December 2020 (2018 or 2019 depending on the source of information) and to the regional level.

For each section, we display key indicators and identify the main unmet needs also considering data gathered through official documents and interviews with regional policymakers and experts. Indicators selected have been presented more extensively in the thematic deliverables with regard to: (i) acute, community, and long-term care; (ii) public health, primary care, and care pathways; and (iii) ICT and e-Health.

POPULATION HEALTH STATUS

Infographic 1 highlights an overall good level of life expectancy at birth and at 65 years in Toscana. However, the overall mortality rate is above the national average along with mortality rates for **cancer pneumonia, influenza, suicide, and cardiovascular diseases**. In this regard, actions and investment should aim to reduce these gaps in the health status of the population.

Health Status

Indicator	Regional value	Italia	Min	Range	Max
Mortality rate per 10 000 inhabitants	118,7	106,9	88,2		141,8
Infant mortality rate per 10 000 bom	20,3	27,6	11,0		41,5
Cancer mortality rate per 10 000 inhabitants	32,3	29,6	24,4		38,9
CVDs Mortality rate per 10 000 inhabitants	40,9	38,3	31,0		52,4
Pneumonia and Influenza Mortality rate per 10 000 inhabitants	3,0	2,3	0,8		3,7
Suicide and self-injury mortality rate per 10 000 inhabitants	0,8	0,6	0,3		1,0
Life expectancy at birth M	81,6	80,9	79,1		81,9
Life expectancy at birth F	85,7	85,2	83,7		86,1
Life expectancy in good health at 65 y M	9,2	7,5	3,8		12,4
Life expectancy in good health at 65 y F	8,0	6,6	3,3		12,5
Rate of peopole in good health 65+ per 100 inhabitants	40,7	34,2	18,2		58,7
Rate of people with one or more chronic diseases per 1 000 inhabitants	201,0	214,5	144,7		277,1




Infographic 1. Population health status

Source: ISTAT Health for All, lasts available year (2017 mortality rates; 2018 life expectancy)

NON-HEALTHCARE DETERMINANTS OF HEALTH

Infographic 2 shows that a small percentage of the population is obese compared to the national average. About a third of the adult population was overweight and had a sedentary lifestyle in 2019, slightly below the national average. Notwithstanding the important positive results gained in life expectancy and the effort made by health professionals to suggest the adoption of healthy behaviours (see Infographic 3), the proportion of smokers among the population aged 15+ was higher than the Italian average (19.9% vs 18.6%) indicating that Toscana should identify a **more effective programme to promote giving up smoking and losing weight, especially among teenagers.**





Factors affecting health status

Indicator	Regional value	Italia	Min	Range	Max
% Sedentary life style	31,3	35,0	10,4		58,3
% Obese people 18+	9,6	11,0	7,9		15,0
% Overweight people 18+	34,6	35,4	30,4		39,5
% Smokers 15+	19,9	18,6	15,5		22,9

Infographic 2. Factors affecting health status

Source: Indagine PASSI (Istituto Superiore di Sanità - ISS), 2017-2019 and ISTAT Health for All, 2019

Health promotion

Indicator	Regional value	Italia	Min	Range	Max
% People suggested to lose weight	46,5	46,9	36,2		56,4
% People suggested to do physical exercise	32,6	29,9	19,7		36,7
% Alcohol high-risk people suggested to reduce consumption	7,3	6,3	2,6		9,8
% Smokers suggested to quit	57,1	51,6	38,1		60,6

Infographic 3. Health promotion

Source: Indagine PASSI (Istituto Superiore di Sanità - ISS), 2017-2019

HEALTHCARE SYSTEM DESIGN AND CONTEXT

3. Healthcare expenditure

Infographic 4 highlights regional per capita healthcare expenditure by type of service. It is evident that Toscana is spending less than the average for acute care, and slightly less than the average for home care, primary care, long-term care, and day care centres while public health expenditure per capita is around the national average. The small expenditure for acute care can be explained by the next infographic (Infographic 5) which shows that Toscana has a lower overall number of beds per 1,000 inhabitants which are mainly managed by the public sector (the share of private care beds is among the lowest in Italy) and a very good level of efficiency (it is the region with the lowest length of stay and is among those with the highest utilisation rate of beds).

Expenditure

Indicator	Regional value	Italia	Min	Range	Max
Acute care expenditure per capita	851,0	892,7	707,0		1.153,0
Home care expenditure per capita	116,0	121,5	84,0		208,0
Long Term Care expenditure per capita	120,0	124,2	27,0		339,0
Day Care Center expenditure per capita	19,0	20,5	3,0		41,0
Primary Care expenditure per capita	112,9	118,2	86,6		168,7
Public health expenditure per capita	93,3	93,9	67,3		140,9

Infographic 4. Per-capita health expenditure, 2018

Source: Our elaboration on 2018 Flusso CE (*) and Flusso LA (**), <https://openbdap.mef.gov.it/>

4. Physical infrastructure and resources

4.1. Physical infrastructure

Infographic 5 highlights the fact that Toscana has a very low number of private acute beds for every 1,000 inhabitants while having a higher number of public acute care beds. Data show that the efficiency of public acute care services is the highest in Italy. **No particular needs emerge from this infographic**

Acute care

Indicator	Regional value	Italia	Min	Range	Max
Number of beds acute care every 1 000 inhabitants- PRIVATE	0,4	0,7	0,1		1,1
Admission rate every 1 000 acute care - PRIVATE	8,2	14,0	1,1		26,2
Average Length of Stay acute care - PRIVATE	4,6	5,2	2,4		11,7
Utilization rate (%) acute care - PRIVATE	51,2	54,1	24,9		88,7
Number of beds acute care every 1 000 inhabitants - PUBLIC	2,8	2,8	1,9		3,5
Admission rate every 1 000 acute care - PUBLIC	96,9	85,9	61,9		110,5
Average Length of Stay acute care - PUBLIC	6,7	7,4	6,7		8,0
Utilization rate (%) acute care - PUBLIC	80,5	83,1	75,4		87,3

Infographic 5. Acute care services, 2018

Source: Ministry of Health, Annuario Statistico 2018

Infographic 6 shows rehabilitation, intermediate and long-term care. Specifically, intermediate care and rehabilitation refer mainly to services used by frail or chronically ill people in a home care setting

who have a high risk of avoidable hospital admission and to services for post-acute patients needing rehabilitative interventions. In Toscana the number of patients assisted in integrated home care (*Assistenza Domiciliare Integrata – ADI*) for every 100,000 inhabitants is among the highest. Conversely, Toscana has a slightly lower number of residential and semi-residential beds for every 100,000 inhabitants (510) compared to the national average (517), including in facilities usually called RSAs (*Residenze Sanitarie Assistenziale – RSA*) that care for elderly and disabled people, including those with mental health conditions. It has around the national average in terms of patients assisted in residential and semi-residential facilities (734.7). Finally, Toscana has a lower number of palliative care beds in hospices per 100,000 inhabitants (3.9) compared to the Italian average (4.6). Actions and investment could aim to **strengthen long-term care, especially hospice care**.

Territorial care

Indicator	Regional value	Italia	Min	Range	Max
Patient assisted in home care (ADI) per 100 000 inhabitants	3.291,6	1.671,8	229,7		4.709,8
Residential and semi-residential beds per 100 000 inhabitants	510,7	516,9	84,3		991,3
Patient using residential and semi-residential care per 100 000 inhabitants	734,7	680,5	96,3		1.925,5
Rehabilitation beds in residential and semi-residential care per 100 000 inhabitants	59,7	47,2	4,5		141,1
Hospice (palliative care) beds per 100 000 inhabitants	3,9	4,6	0,0		8,3

Infographic 6. Territorial care services, 2018

Source: Ministry of Health, Annuario Statistico 2018; Hospice beds Modello STS_24/ISTAT

4.2. Capital investment (fixed asset and equipment)

A proportion of the regional health fund is earmarked for capital investment in the health sector: this includes the construction of new buildings, renovations, and the purchase of technology with a central committee approving which projects to fund. National level funding is available and additional sources can be made available, including ad hoc regional funds, EU funds, self-financing by Health Authorities (such as mortgages, budget advances, and the sale of assets), and non-traditional forms of financing (such as project financing). In Toscana the estimated need for long-term investment in buildings is around €945 million³. In 2017, Toscana made a triennial plan (2017–2019) for medical and biotechnological equipment such as CT and MRI scanners, as well as ECG machines. The plan identified around 2,100 pieces of equipment to be acquired, renovated, or replaced for a total of €248 million (Regional Decree n 804/2017). In 2019, the regional funding earmarked for capital investment was €112 million, a higher value compared with 2017 and 2018⁴.

³ Corte dei Conti, Relazione sulla spesa sanitaria 2019, pp.326 <https://www.corteconti.it/Download?id=1c45c60e-843b-41ff-a41b-17e2e48ac1f1>

⁴ Corte dei Conti, Decisione e relazione al consiglio regionale sul rendiconto generale della regione Toscana per l'esercizio 2019, Volume II Luglio 2020. Pg.62

Infographic 7 on equipment and fixed assets shows that Toscana's per capita public expenditure for equipment is higher (€431) than the Italian average (€333) but shows a lower per capita value for fixed assets (€964) compared to the national average (€727). This can be explained by the prevalence of public health infrastructure, which is higher than the Italian average as shown in Infographic 5. The obsolescence rate for tangible fixed assets highlights the fact that more than half of the assets are already amortised (55.5%) although Toscana is among the regions with the lowest obsolescence rate.

Despite the triennial plan for equipment, the obsolescence rate for equipment is still high (87.7%) which suggests that **investment is still needed for the renovation/replacement of health equipment** to increase safety, accuracy, and productivity and to reduce maintenance costs, with a positive impact on healthcare costs.

Through the Programme Agreements⁵ with the Ministry of Health, Toscana underwrote about 76% of the earmarked pluriennial funds (€1,134 million). Overall, €267 million was earmarked at the end of July 2020 (Regional Decree n. 1019/2020).

Indicator	Regional value	Italia	Min	Range	Max
Financial value of equipment per capita	431,0	333,2	201,7		473,0
Obsolescence rate - equipment	87,7	88,4	81,2		95,8
Financial value of fixed asset per capita	964,3	727,0	453,9		1.227,0
Obsolescence rate - fixed assets	55,0	62,8	51,5		89,2
% recourse at rent for fixed assets	64,1	48,5	28,1		68,3
% of assets under construction	5,2	14,2	4,1		38,9

Infographic 7. Equipment & fixed asset

Source: Flusso SP(Assets and liability statements), <https://openbdap.mef.gov.it/>

The COVID-19 emergency has highlighted capital investment priorities as (i) intensive care units following the introduction of a new national standard set by the Decree-Law 34/2020; (ii) the upgrading of aeraulic systems (ventilation/air conditioning) and medical gases; (iii) low-tech equipment; (iv) facilities maintenance; and (v) territorial networks. Almost €284 million has been allocated (for additional details see Regional Decree n.1019/2020) to enable hospitals to cope with COVID-19 and new ICU beds, as well as other health investment infrastructures. In total, €14.4 million has come from the financing source of the Health Authorities.

Future capital investment has been channelled into telemedicine and other remote control information systems (see for instance Regional Decree n.464/2020).

⁵ The Programme Agreement related to art. 20 of 1988 law considers seven aspects: 1. hospital network plan; 2. requalification of uUniversity hospitals; 3. technological renovation (with particular reference to radiodiagnostic cancer services and radiotherapy); 4. emergency department plans; 5. health information systems; 6. palliative care and community services; 7. dentistry projects.

5. ICT and e-Health

5.1. Digital healthcare: the regional framework

Toscana represents a suitable environment for the optimal use of ICT applied to quality of life, health services, and the economic growth of the territory as a whole.

The new guidelines and actions of the ‘Agenda Digitale Toscana’ plan (approved with the Regional Decree n.1141/2020 of 3 August 2020) confirmed key aspects of digital transformation which were put in place in the years before the coronavirus outbreak⁶ and which can just be considered as accelerated due to the effects of the pandemic. The key points of the digital transformation process in Toscana can be identified as follows:

- a. Infrastructures, enabling platforms and the Cloud
- b. Services for digital citizenship and participation
- c. Innovation for competitiveness
- d. Digital skills, training, and inclusion

The Agenda Digitale Toscana⁷ reports interventions and actions for each key point, related not only to the regional health system, but to all sectors of the local social and economic environment involved in the process of regional digitalisation.

The table below offers an overview of the latest investment for digital infrastructures according to the Agreement between Regione Toscana, Agid, and Agenzia per la Coesione Territoriale:

Denominazione intervento	Risorse finanziarie	Fonti di copertura
Datacentre e Cloud (TIX)	€ 34.974.890,67	Fondi regionali 24.456.603,18 € FESR POR 2.2.1 – 10.518.287,49 €)
PagoPA/IRIS	€ 1.457.958,75	Fondi regionali
Sicurezza e CERT PA	€ 32.704,62	Fondi regionali
START (eProcurement)	€ 6.717.892,37	Fondi regionali
CART/interoperabilità	€ 1.128.497,56	Fondi regionali
Open Toscana/accesso ai servizi	€ 592.407,60	FESR (POR 2.2.2)
ARPA/SPID	€ 644.410,00	FESR (POR 2.2.1)
Open Data	€ 94.696,00	Fondi regionali
Servizi alle imprese e SUAP	€ 4.539.904,39	Fondi regionali (2.549.147,91 € e FESR POR 2.2.1 – 1.990.756,48 €)
Totale	€. 50.183.361,96	

Table 1: List of interventions of the region of Toscana and financial coverage

⁶ DGR 34/2017 ‘Linee guida per lo sviluppo della Toscana Digitale – Agenda Digitale Toscana.

⁷ Allegato A – Regione Toscana, Agenda Digitale Toscana, Linee guida per lo sviluppo della Toscana Digitale, July 2020.

The balanced use of regional and European funds has instituted – through enabling infrastructures such as the Datacentre and the Cloud (TIX) – the electronic digital identity (SPID) for access to the FSE, for the payment of services, and to develop an integrated and single online system for services accessed by the citizens. Access to the system and services is made possible through the regional portal OpenToscana⁸.

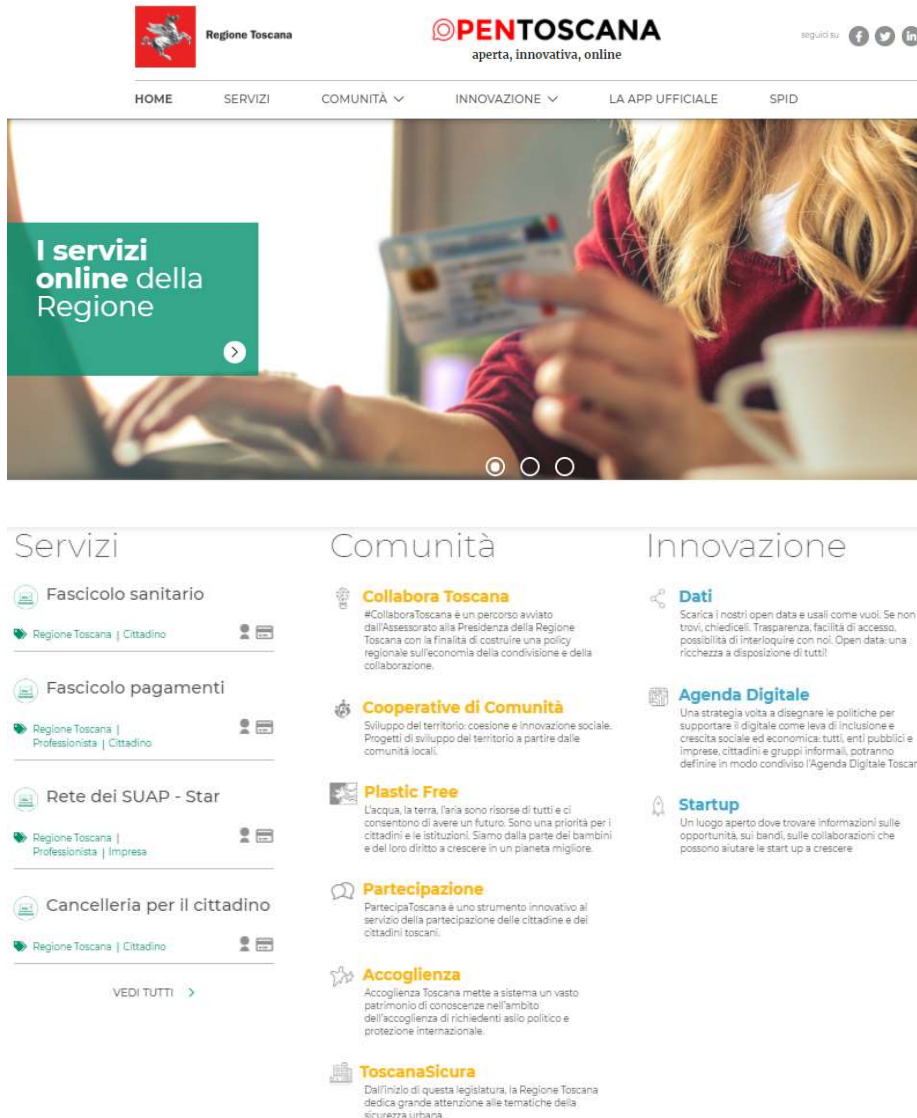


Figure 1: Screenshot of the OpenToscana’s home page portal

⁸ <https://open.toscana.it/>

5.2 Implementation of digital solutions at the regional level

Following the definition of ‘*sanità digitale*’ provided by Agid⁹, we identify three different main intervention areas which are also reported in the framework (deliverable 1), and the thematic report ICT and e-Health (deliverable 2) of our analysis:

- I) Electronic Health Record (*Fascicolo Sanitario Elettronico – FSE*) as an example of an ‘enabling platform’ for the Italian healthcare system at the national and regional level;
- II) Telemedicine and advanced IT solutions (such as AI, big data etc.) applied to the healthcare domain;
- III) Digital Health Services (e.g.: apps, digital health services etc.) as examples of the simplification of the interaction between citizens and healthcare authorities.

Each area has been analysed using specific indicators from national sources and other available validated measurements with the aim of identifying the main features and evident unmet needs in eHealth, as well as digital tools for improving the management of the Toscana regional healthcare system.

- I) FSE – Fascicolo Sanitario Elettronico¹⁰

Below are the latest monitored results of the set of indicators from the AGID source¹¹ for the third quarter of 2020 for the region of Toscana (for more details see the thematic report ‘ICT and eHealth’ deliverable 2).

Toscana shows that the implementation level is complete (100%). There is a good percentage of FSE usage by citizens (57%), which is more than half of the entire population. But the percentage of usage in the last 90 days is not high (17%). This means that less than 30% people with an active FSE are using it regularly. The percentage usage by *medici* (GPs/paediatrician) is low (3%) and they do not ‘feed’ the FSE (0%). Conversely, in the case of *Aziende sanitarie* health operators, we can see completed activation (100%) and a rapid complete percentage of ‘feeding’ and usage (99.71%). This means that in hospitals and health authority settings, the use and ‘feeding’ of FSE is part of daily care.

⁹ <https://www.agid.gov.it/piattaforme/sanita-digitale>

¹⁰ <https://www.fascicolosanitario.gov.it/>

¹¹ With the aim of monitoring the state of implementation and dissemination of the FSE throughout the country and in each region, the Italian Digital Agency (Agid) and the Ministry of Health, in agreement with the regions, have defined a set of indicators that allow the evaluation of results of the regional policies based on two distinct groups of indicators (as illustrated in the ICT and eHealth thematic report - deliverable 2):

- a) Implementation indicators
- b) Usage indicators

The first group (a) takes into account the enabling components for making access available by patients, GPs, paediatricians, healthcare authorities, and hospitals. It also includes interoperability conditions, management of, and access to, laboratory reports, the management and updating of the Patient Summary.

The second group (b) takes into account the real level of the usage and dissemination of the FSE taking into account the different ‘user’ categories: patient (Cittadini), GP/paediatricians (*Medici*), and healthcare operators in the healthcare authorities and hospitals (*Aziende sanitarie*). There are two FSE usage indicators: the first one is ‘FSE Activation’ (one access as a minimum), the second one is the FSE usage in the last 90 days (from each category of user).

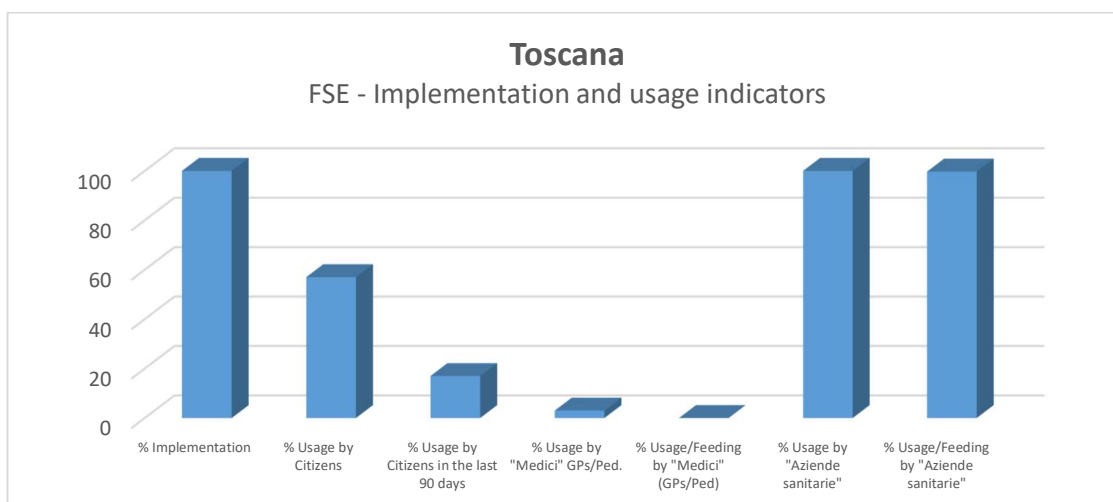


Figure 2: FSE Toscana: Implementation and usage indicators, 2020

The table below provides an overview of supplementary data/services provided for citizens and health operators through the FSE in Toscana. At this point in time, the results show it to be one of the most advanced FSEs in Italy with lots of functionalities and integrated services as reported in the graphic below:

Supplementary data/services for citizens	Functionality activated
UNIQUE ACCESS FOR ONLINE VISITS RESERVATIONS	✓
UNIQUE ACCESS FOR ONLINE PAYMENTS FOR HEALTH SERVICES	✓
ONLINE PICK-UP OF HEALTH REPORTS	✓
PAYMENT EXEMPTION SERVICE	✓
VACCINATION DIARY ALWAYS UPDATED	✓
SERVICE FOR THE CHOICE/CANCELLATION OF THE GP AND PAEDIATRICIAN	✓
PERSONAL NOTEBOOK: FEEDING OF THE FSE WITH DOCUMENTS GENERATED OUTSIDE THE NHS	✓
SERVICE FOR THE MANAGEMENT OF EMERGENCY INFORMATION (First aid/health and discharge reports)	✓
NOTIFICATION SERVICE OF A NEW REPORT (BY SMS OR EMAIL)	✓
‘APP Smart SST’ ¹² : FOR THE DISPLAY AND PICK-UP OF HEALTH REPORTS	✓
FOR THE DISPLAY OF E-PRESCRIPTIONS	✓
FOR THE DISPLAY OF A VACCINATION LIST	✓
FOR THE DISPLAY AND MANAGEMENT OF A PERSONAL NOTEBOOK	✓
FOR TICKET PAYMENT	✓

Table 2: FSE Toscana—supplementary data/services

Source: <https://fascicolosanitario.regione.toscana.it/>

¹² <https://www.regione.toscana.it/-/smart-ssst>

As highlighted by the Agid indicators, Toscana is among the regions where the implementation and use of the FSE have reached a considerable level. So **FSE is not to be considered a priority investment** in terms of technology deployment and broad-wide diffusion and usage among health operators in *Aziende sanitarie*. Nevertheless, the usage indicators by citizens, GPs, and paediatricians suggest that **specific actions and investment should be planned to increase the motivation and abilities in digital skills of these groups** in order to improve the exchange of patients' data during the pandemic and beyond.

II) Telemedicine and other IT solutions

The Italian national guidelines of 2015¹³ provide the regions with a general framework for the management of telemedicine (TM) services. The implementation and sustainability of TM services in care practice is entrusted to each region and its healthcare authorities and hospitals. Each region, in collaboration with the local health authorities, may define its conditions of coverage and provision of the TM service by referring to the national guidelines and by implementing the service in local health settings independently, based on the availability of its budget and/or also through the support of other external funding.

As reported in the thematic report ICT and eHealth (deliverable 2), the most recent official mapping of telemedicine solutions took place in 2019. The mapping revealed 282 telemedicine experiences in Italy in 2018 and 31 of them were in Toscana.

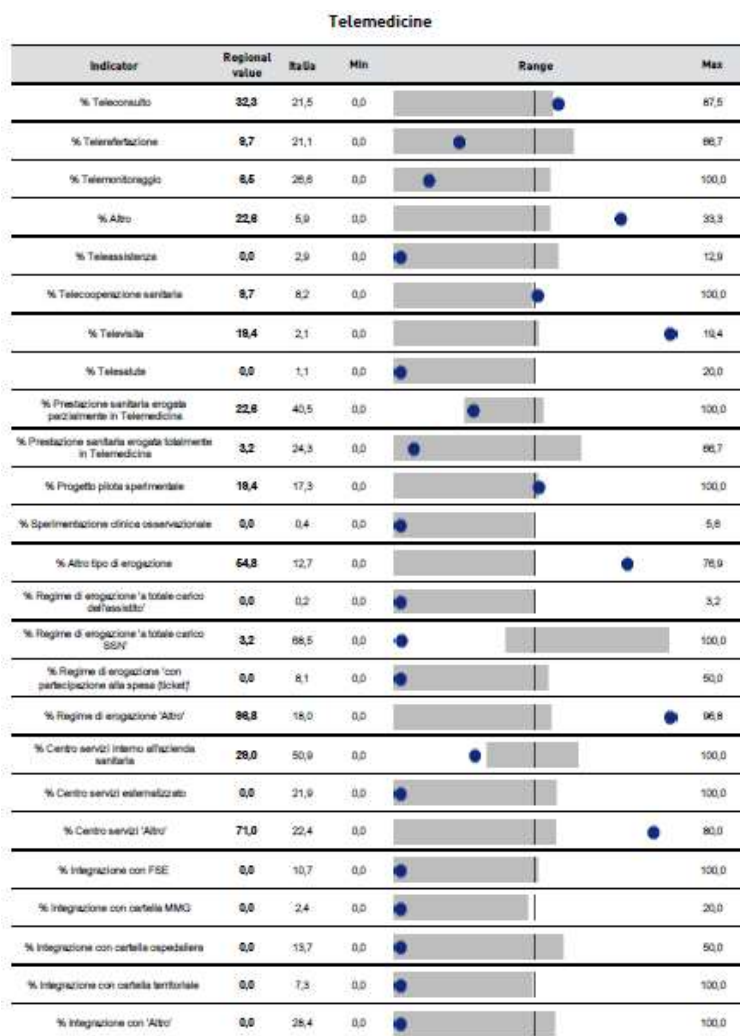
Infographic 8 shows the main features of the 31 telemedicine projects in Toscana before the COVID outbreak. The indicators show the most used TM service is *teleconsulto* in line with the Italian average. Conversely, the *telerefertazione* and *telemonitoraggio* distribution is lower than the Italian average. Toscana shows a higher distribution of *televisita* and other services of the category *altro* compared to the Italian average. As far as the type of activity is concerned, the infographic shows whether types of activities were provided to patients totally or partly as telemedicine or whether they were part of experimental pilot projects. In Toscana the services are provided partially or entirely by remote means through telemedicine with a low percentage compared to the Italian average. Furthermore, with an inverse trend compared to the national average, the highest percentage of services are pilot projects.

Regarding the 'service provision regime,' we also observe a similar inverse trend compared to the national average for this second indicator: the lowest dimensions in Toscana are 'fully in charge of SSN' and 'covered by ticket'. The average of the 'external funding' regime is instead significantly higher than the national average.

With regard to the technical indicator of the type of 'service centre' (which includes hosting, security, help desk, maintenance) the infographic shows that of all three dimensions 'within' the healthcare facilities, 'external provider' and 'other technical solutions', the highest percentage of all is related to 'other technical solutions'. This is another peculiarity of the Toscana territory as for the national average the 'service centre' is mainly located 'within the health structure/hospital' in more than 50% of the cases. Finally, the infographic highlights the level of integration between TM solutions and other digital tools like FSE, GPs' Electronic Health Record (EHR), hospitals' Electronic Health

¹³ Intesa tra il Governo, le Regioni e le Province autonome di Trento e Bolzano sul documento recante 'Telemedicina - Linee di indirizzo nazionali. (Repertorio Atti n. 16/CSR del 20/02/2014). http://www.salute.gov.it/imgs/C_17_pagineAree_2515_1_file.pdf

Record, and the Electronic Health Record of territorial services. The TM services in Toscana is not integrated with the other digital tools considered as it happens in the rest of the Italian regions.



Infographic 8: Telemedicine projects in Toscana, 2018-19

Source: Agid – Ministero della Salute “Mappatura delle esperienze di Telemedicina sul territorio nazionale nell’anno 2018” – Ufficio 3 DGSIS

Under COVID-19

In April 2020, the *Istituto Superiore di Sanità* (ISS) issued ‘interim guidelines’ to define general conditions and characteristics of the remote assistance services to be implemented nationwide during the emergency health situation. From this point, with the latest Regional Decree n.464/2020 in April 2020, Toscana provided results on the implementation of Telehealth services¹⁴. Specifically, with the Regional Decree mentioned above, the provision of *televisita* and *teleconsulto* during the emergency was defined and extended to cover 83 different types of healthcare support not related to COVID-19. The Regional Decree n.464/2020 was issued during the first lockdown due to the COVID-19

¹⁴ All health services provided by *televisita* during the COVID-19 emergency are covered by the SSN with the regional Code ‘TLV01= esenzione per *Televisita*’.

pandemic, with the aim of improving continuity of care for chronic patients in line with the measures aimed at containing the infection.

Within a few months, substantial telemedicine support had been distributed throughout the entire territory of Toscana according to each discipline as follows:

Televisita di controllo	N	%	% cum.
Diabetologica	13.011	22	22,1
Psichiatrica	3.936	6,7	28,8
Telecolloquio psicologia clinica	3.928	6,7	35,5
Cardiologica	3.865	6,6	42,1
Endocrinologica	3.672	6,2	48,3
Oncologica	3.281	5,6	53,9
Neurologica	2.516	4,3	58,2
Reumatologica	1.998	3,4	61,6
Odontostomatologica	1.571	2,7	64,3
Ematologica	1.405	2,4	66,6
Infettivologica	1.339	2,3	68,9
Dermatologica	1.278	2,2	71,1
Nutrizionale	1.187	2	73,1
Allergologica	1.113	1,9	75
Gastroenterologica	1.104	1,9	76,9
Medicina interna	1.076	1,8	78,7
Pneumologica	970	1,7	80,4
Nefrologica	939	1,6	82
Immunologica	932	1,6	83,5
Geriatrica	883	1,5	85
Altre	8.799	15	100
Totale	58.803	100	100

Table 3: Number of *televisite* from 1st March to 30th September 2020 per discipline (focussing on the first 20 disciplines)

Source: ARS Toscana (Agenzia Regionale di Sanità)

Overall, in the period from March to September 2020, almost 59,000 *televisite* were provided in almost all of the clinical disciplines (77 of 83). This represented 85% of the total number of disciplines¹⁵. The most frequent telemedicine service was *televisita*, particularly diabetology control with about 13,000 *televisite*.

Due to the pandemic, the Toscana Region was very prompt in providing guidelines to the local health authorities and hospitals for the provision of *televisite*, as well as in the design and development of the necessary IT support. For example, integrated applications of telemedicine were introduced with a regional online booking platform for arranging *televisite* which was directly controlled by patients. Telemedicine is becoming an important solution in Toscana, especially during this emergency phase, and it enables ever wider categories of patients to access routine medical services. The increase in infections due to COVID-19, with the consequent introduction of rules of social distancing, did not allow health facilities to resume at full speed the activity interrupted in the initial months of the pandemic. So, today, it is more than ever necessary to ensure the availability of qualified healthcare professionals by providing alternative delivery methods as in the case of ‘*televisita*’ and ‘*teleconsulto*’. The important contribution of telemedicine to provide specialist check-ups and continuity of care has only partially filled the gap that has arisen in the care of chronic patients during this emergency phase. However, the further strengthening of telemedicine is highly advisable in order

¹⁵ <https://www.ars.toscana.it/2-articoli/4466-televisite-in-toscana-durante-epidemia-coronavirus.html>

to reduce the disparities between the various territories even within the same region. Furthermore, GPs should be encouraged to extend the use of telemedicine solutions in their daily care practice.

In August 2020, the Toscana region approved a relevant investment¹⁶ (€10,000 million in the three-year period 2020–2022) for a telemedicine project called ‘*A casa in buona compagnia*’¹⁷. This is focussed on the management of elderly people with heart diseases (up to about 50,00 people throughout the region). Specialist doctors and GPs will work directly on the FSE (Fascicolo Sanitario Elettronico) of the patient, where in addition to being able to consult all the reports and treatment plans, they will have a summary sheet for checking the patient’s health status at home. The nursing team will have an app dedicated to home care, where they can record every time it is used and all activities that are carried out in real time. In the second phase of the project, the feasibility will be evaluated of interfacing this solution with a series of more sophisticated medical devices for specialised applications.

Investment for further **deployment of telemedicine solutions** should support:

- the **integration of different EHRs**, particularly with the FSE and territorial ones for the treatment of elderly and chronic patients in accordance with the population health status indicators highlighted in the previous sections;
- **the training of healthcare professionals**, particularly GPs and paediatricians to improve their ‘**digital skills**’ in the use of telemedicine and digital solutions.

III) Digital health services

The Toscana region has focussed on technology and innovation to develop and strengthen its integrated information system¹⁸. Since the beginning of the pandemic, it has used its own available and complete data sources to facilitate pandemic management process for all health professionals (healthcare authorities, hospitals, crisis units, and the regional task force).

Here are some examples of services recently implemented through the use of new technologies:

- 13 laboratories involved in the swabs testing were integrated with each other to form a single regional platform. The purpose was twofold, first to make it possible to obtain the results quickly and directly from the healthcare companies, and then to facilitate the rapid analysis of the data in a centralised manner, linking this information to the entire big data system of the Toscana region for the purposes of monitoring and interaction;
- 2.1 million electronic prescriptions have been prescribed by GPs, specialists, or paediatricians and sent automatically via text message (SMS) to citizens’ mobile phones, thus limiting travel and crowding in doctors’ offices;
- mHealth¹⁹ solutions, namely the development of apps for smartphones and tablets that enable the governance, programming, and provision of home services to that huge

¹⁶ <https://www.toscana-notizie.it/-/a-casa-in-buona-compagnia-al-via-il-progetto-sull-assistenza-alle-persone-con-cronicita>

¹⁷ <https://uilpensionati.it/toscana-regione-approva-il-finanziamento-del-progetto-di-spi-fnp-uilp-a-casa-in-buona-compagnia/>

¹⁸ DGR n. 464/2020. The Toscana region has strengthened its digital health and innovation processes with a single regional platform that will remain active beyond the COVID-19 emergency.

¹⁹ mHealth=mobile Health

proportion of citizens who have remained in domestic isolation, quarantine, or who are simply treated at home by integrated home assistance. The screenshot below shows the views of the electronic health record and health parameters used by the USCA²⁰ during the home visit along with the services provided (dressings, therapies, swab sampling, etc.). With the use of a QR code for each patient, it is possible to open the medical record from a smartphone or tablet during a home visit and record the vital parameters (oxygen saturation, heart rate, respiratory rate, and temperature).

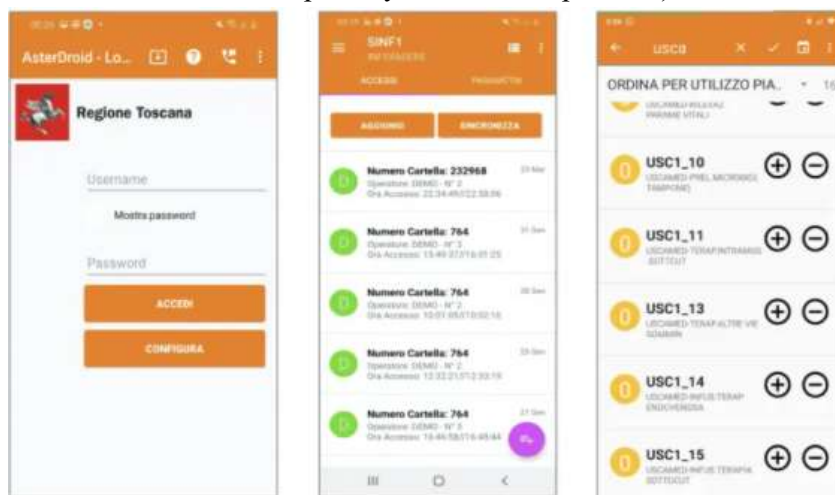


Figure 3: Screenshot of mobile app used by USCA during home visits.

<https://www.agendadigitale.eu/sanita/sanita-e-territorio-contro-il-covid-accade-in-regione-toscana/>

- #inRSAsicura: this is an application dedicated to the centralised control and monitoring at the regional level of patients in RSAs²¹ (over 14,000 beds). Through the app #inRSAsicura, nurses can record vital parameters with total mobility directly at the head of the bed, or fill in evaluation scales (Barthel, MEWS, etc.). Furthermore, doctors²² (the regional decree estimates 1 doctors for every 300 beds), with the use of the app, can follow patients in the RSAs throughout the whole of Toscana, receiving appropriate alerts.

²⁰ USCA=Unità speciali di continuità assistenziale (Special Continuity Care Units) to strengthen the management of the health emergency in the regional territory during the epidemic.

²¹ RSA=Residenze Sanitarie Assistenziali i.e. long-term care facilities for elderly people.

²² Ordinanza n. 49 – 3rd May 2020

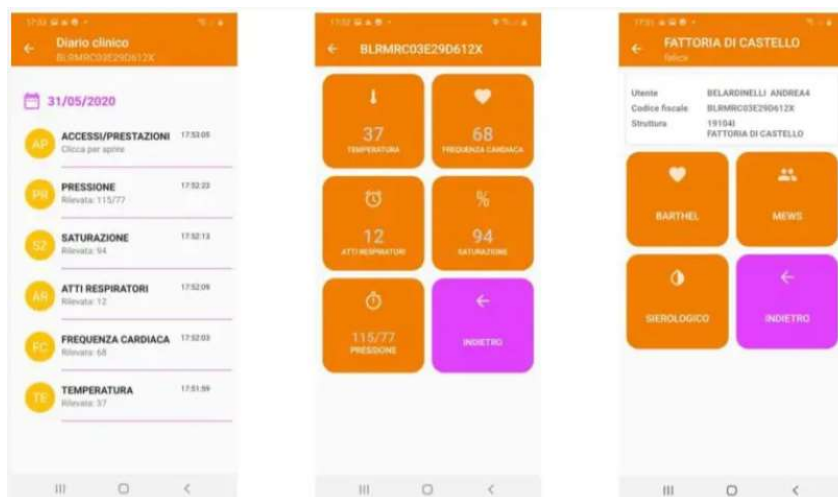


Figure 4: Screenshot of “#inRSAsicura” app used for monitoring and control of patients in RSA by nurses, GPs and doctors.

<https://www.agendadigitale.eu/sanita/sanita-e-territorio-contro-il-covid-accade-in-regione-toscana/>

Some of these services were developed thanks to the investment done in the SAP Hana²³. The training process on the analytics is still ongoing.

Investment in the further development of digital health solutions **are not to be considered a priority** in Toscana. Instead **investment supporting integration among the current digital health solutions and new monitoring tools and IT systems** for primary care, LTC, and public health **should be considered appropriate, as should the possibility of sharing and surfing the analytics tool at the local level.**

HEALTHCARE PERFORMANCE

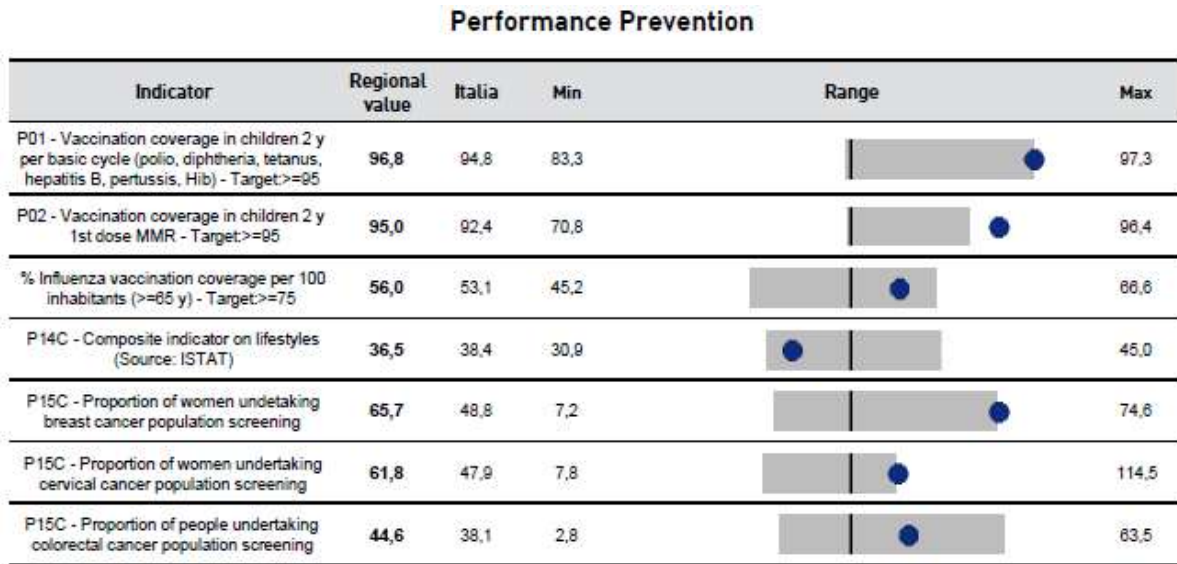
6. Public health/Prevention

Infographic 9 shows that child immunisation has achieved very good coverage in Toscana (above 95% on average), while flu vaccination coverage for the elderly is still not satisfactory, about 56% compared to the target of >75%, even though this is higher than the national average (53%). As for free population-based screening, both breast and cervical cancer screening are attended by a higher percentage of the population compared to the national average but there is still room for improvement (the standard is set at 70%). The worst attendance is registered for colorectal cancer screening; only 45% of the population undertook the screening and the take-up over the last five years has not

²³ <https://www.industriaitaliana.it/sap-artsana-digital-transformation-intel-ecosistema-digitale/>.

SAP's High-performance Analytic Appliance (HANA) platform is a data warehouse for processing large volumes of operational and transactional data in real-time. As a result of processing this data in the main memory of the server it can provide immediate results such as analysis and transactions. Translated into everyday language, this means that applications can directly access data from memory instead of reading information from a disk and loading it into its memory for every single operation. Regione Toscana was among the first regional authorities in Italy to adopt SAP HANA, choosing to use the analytical components of the platform for the study of administrative data. In recent months, however, due to the COVID-19 emergency, the regional authority has decided to extend the analysis of the data relating to swabs and the monitoring/tracking phase of the COVID-19 pandemic to all hospitals and health organisations of the region

improved. Actions and investment should aim to **continue screening communication and flu vaccination awareness campaigns.**



Infographic 9. Performance Prevention

Source: Ministry of Health, NSG Core indicators 2018; Influenza vaccination ISTAT Health for All 2019

During the COVID-19 pandemic, Toscana, like other regions, stopped inviting the population to screening programmes during March (mid-March) and April 2020 as a preventive measure reducing access to healthcare facilities, while maintaining second level (in-depth) screening which could not be postponed. Sometimes this involved performing a telephone triage to ascertain the conditions of the citizen²⁴. The complete cessation of screening could lead to serious implications for diagnosis and clinical outcomes for cancer patients. To reduce the delays generated both by the suspension and by the need for physical distancing, the screening capacity has been increased with the opening of the facilities over six days (from Monday to Saturday) and with a longer period of time slots available (12 hours). This strengthening of the system’s capacity shows **no need for additional investment in population-based screening programmes to cope with COVID-19.**

7. Hospital and Emergency care

Overall, the performance of acute care hospitals is good (Infographic 10). Among Italian regions, the hospitalisation rate is one of the lowest (120.4 for every 1,000 residents) with a constant decreasing trend which especially reduces potentially inappropriate hospitalisation. For acute care, the indicators of Infographic 10 show that Toscana meets all the Italian standards and has the best performance for the quality indicator of femur fracture. C-section in hospitals with < 1,000 deliveries is close to the standard: Toscana is at 18% versus the target of 15%.

²⁴ <https://europadonna.it/2020/03/20/screening-oncologico-coronavirus-monitoraggio-regioni/>

Performance Hospital

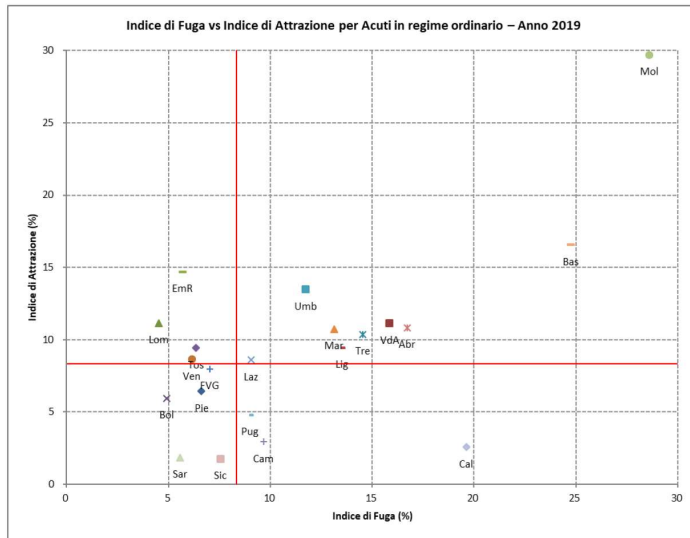
Indicator	Regional value	Italia	Min	Range	Max
H01Z - Std hospitalization rate (ordinary and daytime) every 1 000 resident - Target:<= 160	120,4	130,5	113,7		149,9
H02Z - % breast cancer surgery performed in wards with >= 135 surgery per year	82,0	63,7	0,0		98,8
H04Z - Ratio between hospitalizations for DRG at high risk of inappropriateness and DRG not at risk of inappropriateness in the ordinary regime - Target:<=0,21	0,1	0,2	0,1		0,2
H13C - % patients 65+ with femoral neck fracture operated within 2 days in the ordinary regimen - Target:>=80	75,5	64,0	32,3		75,5
H17C - % primary caesarean deliveries in facilities with < 1 000 deliveries per year - Target:<=15	18,1	22,8	10,3		36,5
H18C - % primary caesarean deliveries in facilities with > 1 000 deliveries per year - Target:<=25	22,1	21,5	0,0		38,2

Infographic 10. Performance of Acute care

Source: Ministry of Health, NSG Core indicators 2018

On average the outcome indicators monitored by National Outcome Programme (*Piano Nazionale Esiti – PNE*)²⁵, show Toscana’s good performance for time-critical diseases (for instance the mortality rate for AMI and stroke are below the Italian average), confirming that the quality of acute care provided is good. Despite the 30 day mortality rate for strokes – showing that Toscana worked very well in prompt diagnosis and intervention (acute care phase) registering a lower short-term mortality rate (7.45 was the median rate vs 10) – after one year this advantage was completely lost by Toscana in comparison to the Italian average (around 16 deaths per 100). This means that **Toscana should invest in integration of care and community services for these types of diseases**. The indicators measuring perceived quality by patients (see satisfaction with the care provided by medical doctors and nurses, a 2016 survey in the deliverable of acute care) are lower than the average while the patient inter-regional inflow and outflow also confirm the good performance of acute care. With regard to the latter, Figure 4 shows a small percentage of patients seeking acute care outside Toscana (about 6.3%) while a constant inflow of patients is registered (9.4%). **Overall acute care quality can be considered a met need**. However, it is worth noting an increase in the absolute number of hospitalisations for the resident population as well as a reduction for patients coming from the other regions.

²⁵ See the report of PNE https://pne.agenas.it/main/doc/Report_PNE_2019.pdf



Confronto Indice di Fuga vs Indice di Attrazione per Acuti in Regime ordinario - Anno 2019

Figure 5. Patient inter-regional mobility for acute care: inflow (y-axis) and outflow (x-axis)²⁶ by region, 2019

Source: Ministry of Health, Rapporto SDO 2019

Figure 6 indicates the quality perceived through the indicator of Patients Leaving Against Medical Advice. This indicator shows that Toscana is performing very well at provider level.

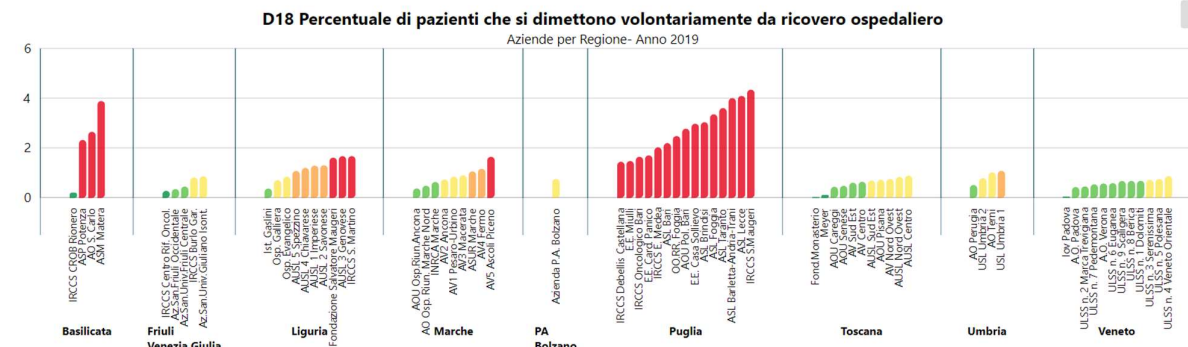


Figure 6. Percentage of patients leaving against medical advice in the hospital setting, by region, 2019

Source: Inter-Regional Performance Evaluation System of Scuola Superiore Sant’Anna (Pisa)

<https://performance.santannapisa.it/pes/network/home.php>

Toscana has a very good performance in acute care but the COVID-19 outbreak has put this system under pressure. Toscana has been among the regions of Italy most severely affected by the pandemic, from the first wave onwards. According to the Italian Ministry of Health's COVID-19 dashboard Toscana had 112,344 cases and 3,151 deaths as of 13 December 2020, which is around 6% of all cases and 4% of all deaths in Italy. In particular, in the first wave, Toscana had to cope with the

²⁶ ‘Attraction rate’ is calculated as the ratio of the number of patients from outside the region admitted to any regional hospital in relation to the total number of admissions of that hospital. The ‘escape rate’ is calculated as the ratio of the number of resident patients transported to other regions in relation to the total number of residents of the region admitted to any Italian hospital. Both indices range from zero (no attraction and no escape) to 1 (i.e. ‘attraction rate’ is 1 if the regional hospitals serve only patient residents in other regions, and ‘escape rate’ is 1 if all resident patients are hospitalized in other regions).

demand for ICU beds as well as other acute beds and intermediate care facilities to take charge of COVID-19 patients that could have been discharged from acute care hospitals. This was even more challenging during the second wave of infection²⁷. However, Toscana relied upon the regional public hospital network that provided some relief during the first wave.

In light of the general need for additional capacity in ICU, the Italian government identified new standards: 0.14 ICU beds per 1,000 inhabitants and 0.07 sub-ICU beds per 1,000 inhabitants (see Decree-Law n. 34 May 2020). Table 4 summarises the ICU bed targets and percentage of fulfilment at the end of October 2020²⁸ among the Italian regions. Toscana has defined a plan for the reorganisation of the acute care network with delibera n. 741/2020 ‘Piano di riordino della rete ospedaliera in emergenza COVID-19 di cui all’art. 2 del d.l. 34/2020’. In October Toscana had achieved 77% of the expected new ICU bed target. On 9 November Toscana identified resources to be invested in implementing the COVID reorganisation plan: €79 million (delibera 1393/2020). Some of the investment identified during the summertime included funds to support the adaptation of COVID hotels or homes to be able to host monitored (remotely or in person) COVID patients for health purposes. **Investment in intermediate care should also be supported in order to cope with the current pandemic situation.**

Regions	Pre-Covid ICU beds	ICU beds target	ICU beds (October)	% ICU beds on the target
Campania	335	834	427	51%
Calabria	146	280	152	54%
Umbria	70	127	70	55%
Marche	115	220	127	58%
Piemonte	327	626	367	59%
Puglia	304	579	366	63%
P.A. Trento	32	78	51	65%
Lombardia	861	1446	983	68%
Abruzzo	123	189	133	70%
P.A. Bolzano	37	77	55	71%
Sardegna	134	236	175	74%
Sicilia	418	719	538	75%
Molise	30	44	34	77%
Toscana	374	536	415	77%
Emilia-Romagna	449	641	516	80%
Lazio	571	845	747	88%
Basilicata	49	81	73	90%
Liguria	180	223	209	94%
Friuli Venezia Giulia	120	175	175	100%
Valle d'Aosta	10	18	20	111%
Veneto	494	705	825	117%
Total beds	5179	8679	6458	74%

Table 4. Number of ICU beds before COVID-19, number of expected ICU beds, number of new ICU beds activated by October, % target fulfilment.

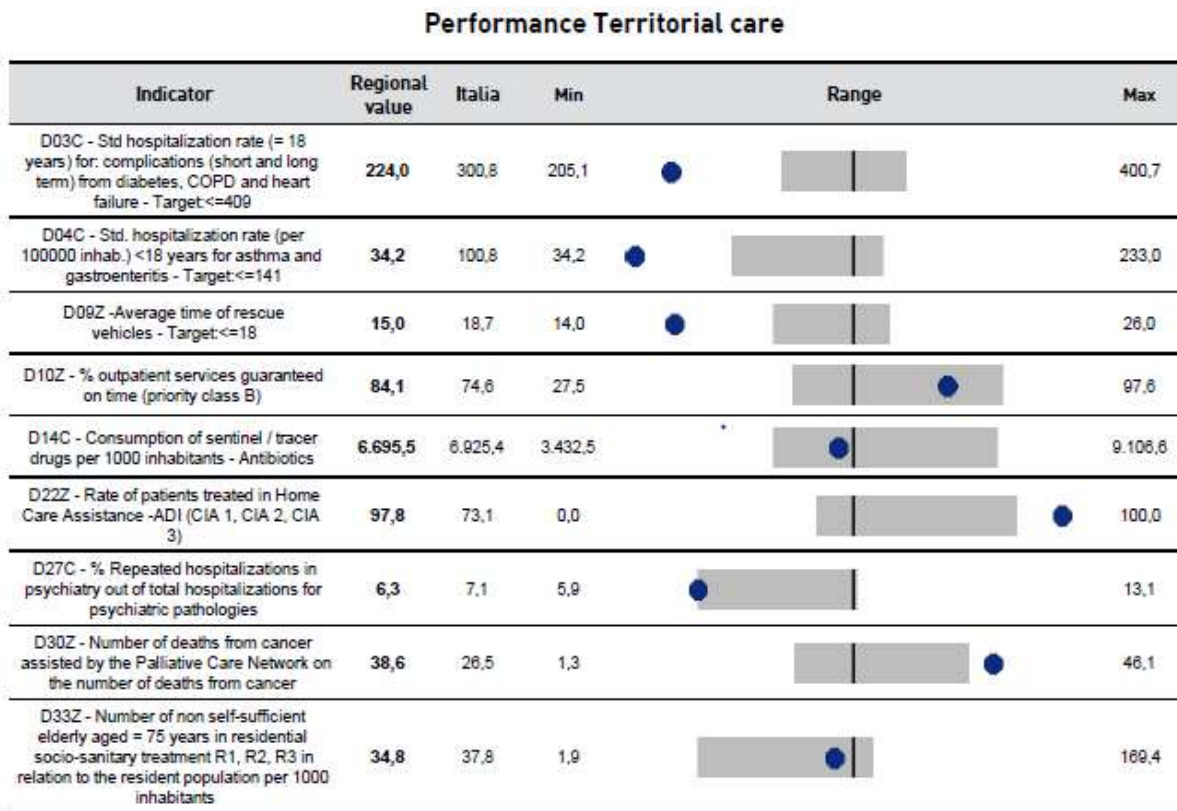
Source: Osservatorio Conti Pubblici Italiani 24 October 2020.

²⁷ The infographic on the weekly distribution of COVID cases show that Toscana was hit both in the first and second waves. <https://www.epicentro.iss.it/coronavirus/sars-cov-2-dashboard>

²⁸ Source: Osservatorio Conti Pubblici Italiani 24 October 2020

8. Territorial care: primary care, community care and long-term-care

Infographic 11 shows some proxy indicators on the performance of primary care both for children and the adult population. In 2018, Toscana had the lowest hospitalisation rate in Italy for asthma and gastroenteritis among children (<18 years) (34.2 for every 100,000 inhabitants). This consolidated a decreasing trend. This suggests that paediatricians are successful at keeping children out of hospitals. Also, the share of the adult population with hospital admissions due to chronic conditions (COPD, diabetes complications, heart failure) provides a measure of the efficiency of primary care. Toscana meets the required standard of less than 400 hospital admissions per 100,000 inhabitants, registering one of the lowest values for all of the Italian regions (224 vs 300). In addition, inappropriate prescribing can be seen as a source of waste and low efficiency. In this regard, Toscana has a lower than national average consumption of antibiotics per 1,000 inhabitants, and a decreasing trend since 2014, but there is still room for improvement. **No specific actions to improve efficiency in primary care should be considered.** However, there is a need to refresh the models of care such as those related to chronic care which seem to be frozen (see Chapter 9).



Infographic 11. Performance territorial care

Source: Ministry of Health, NSG Core indicators 2018

Over the last decade, the RHS has pushed for the reorganisation of the delivery of primary care, with the objective of moving from the traditional single practice model of GPs to an integrated care model. A move towards team-based primary care that integrates different healthcare professionals and bridges the gap between the front-line and patients can improve health outcomes especially for

patients with chronic conditions and multimorbidity. Statistics report on average 87% of GPs and 70%²⁹ of paediatricians in Toscana practice in base groups or network practices, which is a percentage well above the Italian average. The traditional aggregative working model used in Toscana is *Aggregazioni Funzionali Territoriali – AFT* which was developed in 2013 in response to Decree Law Balduzzi (189/2012). AFT are compulsory networks of GPs (usually 20–25 doctors) who are expected to apply clinical governance principles in order to continuously improve the quality of services and safeguard high standards of care. Since 2013, 116 AFTs have been established throughout the RHS (2017 data)³⁰. On average, each AFT serves a population of about 30,000 patients. AFTs are oriented to (i) providing better care for chronic patients, for example by promoting chronic disease self-management programmes (known as *Sanità di iniziativa*); (ii) improving clinical governance; (iii) promoting integration of care among settings of care and professionals.

In the light of this, Toscana has invested in a more advanced integration model creating multi-professional and multidisciplinary groups of practice which also involve nurses and social workers. These groups provide comprehensive and continuous medical care to patients within a defined community (to ensure proximity). Multi-professional groups are based on the collaboration between GPs and specialists such as diabetologists, cardiologists, pulmonologists, oculists, and nephrologists, among others. This is in addition to outpatient healthcare providers. This model requires the structural integration in health facilities of multi-specialist professionals (GPs, specialists, nurses, social care workers, administrative staff, etc.). This arrangement is referred to as Primary Care Complex Aggregation (*Unità Complessa di Cure Primarie - UCCP*) and in Toscana they are called *Case della Salute*. There are 70 *Casa della Salute* or Community Health Centres (CHCs), which are expected to increase to 116 by the end of 2021³¹. **The expected expansion of facilities offering multi-specialist health and social care is a potential area of investment for the renewal/refurbishment and/or building for *Case della Salute*.**

In Toscana on average each practicing GP had 1,185 registered patients compared to a national average of 1,211 and each paediatrician on average assisted 965 children in line with the national level (1,087 vs 989)³². The older age of primary care physicians (about 60% have more than 23 years of working experience) is a common weak point of primary care since it can slow change and the take-up of innovation. **Specific training/education strategies need to be considered for healthcare professionals working in primary care to promote change management and digital literacy.**

Specialised ambulatory care including visits, diagnosis, laboratory services, and other curative therapies not requiring hospitalisations are provided directly through health district clinics and outpatient hospitals, laboratories, and both public and accredited private suppliers. Data from Infographic 11 shows that over 84% of specialised ambulatory care is on average ensured within the maximum waiting time set at the national level. Long **waiting lists** – a common phenomenon in Italy – **seem not to be a critical issue in Toscana** even though attention should be focussed on strengthening system capacity to cope with delays in outpatient services due to a reduced offer during

²⁹Ministry of Health Annuario Statistico 2017

³⁰Nuti S, Vainieri M, Barsanti S, D’Orto G, Parenti A, Vinci B. IL Sistema Di Valutazione Della Performance Delle AFT Toscane Report 2017; 2018.

³¹<https://www.toscana-notizie.it/-/case-della-salute-sempre-pi%C3%B9-vicine-alle-esigenze-dei-cittadini>

³² Each GPs can assist a maximum number of 1,500 patients while paediatricians can assist between 800 and 880 children as an upper limit.

the COVID-19 pandemic. The region was one of the first to implement *televisite* to offer an alternative and immediate service to patients needing follow-up services (see paragraph 5 for more details).

Toscana also opted for an integrated health system in terms of accountability through a partnership between health and social systems such as the *Società della Salute*. The LEA grid highlights the fact that Toscana meets the Italian standards for the number of beds in long-term care facilities for elderly but not for people with disabilities. Moreover, it is worth noting that Italy is much lower than the European average. Governance of RSA is mixed. On the one hand, there is a web platform which was created after the DGR 995/2016 (<https://servizi.toscana.it/RT/RSA>) where all the Tuscan RSA are listed along with some basic information (number of beds, tariffs, and services provided). It is possible to check the availability of the beds in the RSA through this portal. On the other hand, the COVID-19 outbreak highlights evidence that these facilities, with fragmented ownerships, need to be more tightly controlled. Hence, in Toscana there is also a **need to improve the monitoring tools and health information systems in order to better govern long-term care**. The #RSASicura app, created by a recent investment, should also be transformed into a source of information to better monitor and govern the nursing homes. However, other services dedicated to other frail patient categories (e.g. disabled people) are as yet uncovered.

In Toscana, the rate of elderly patients treated in home care (at the different intensity of care) is among the highest (Infographic 11). This choice to provide home care services could be even more strongly supported by the introduction of family and community nurses already, which has already been stipulated in 2018 by Decree Law 597/2018. This new professional role for Italy will take care of the patients at home supporting primary care physicians and strengthening home care assistance. During the COVID-19 pandemic, the special units for continuity of care (USCA) confirmed the importance of providing care at home as well as the important role of family nurses. **Investment should also target dedicated education and training programmes on extended roles for community and family nurses. Furthermore, investment should be dedicated to the transformation of the USCA as well as adding to the investment previously to transform intermediate care into ‘the new normal’.**

Despite Toscana being among the best performing regions in the care of cancer patients as a result of the well-established regional cancer care network, the region registers a higher cancer mortality rate compared to the national average (Infographic 1). Overall, the region demonstrates a good performance in population-based screening and oncological treatments (both surgical and medical) however, end-of-life care and palliative care could be improved. Indeed, there is a need to increase the number of beds for hospice facilities (residential facilities for end-of-life patients). Also, better integration should be considered between hospital and territorial services during follow-ups. A recent strategy to this end has been the boost of oncological territorial services promoting care continuity while shifting the focus of care from the hospital to the patient during follow-ups (Regional Decree n. 735/2020). An ‘oncological team’ working across care settings should be instituted and more services (e.g. follow-ups or management of complications) should be provided outside the hospital setting, especially because the long survival of cancer patients often means also managing patients with multi-morbidities. Toscana is investing in the piloting of oncological territorial services and the recruitment of oncologists working outside hospitals assisting patients at home in intermediate care (eg, *Case della Salute*), or in residential/semi-residential facilities. This model has received special

attention during the COVID-19 emergency since it can free up hospital capacity. Additional investment should be planned in information systems in order to develop a clinical path medical record (*cartelle cliniche di percorso*) to allow successful integration and collaborative work across care settings.

9. Care pathways: chronic patients

The current Regional Social and Health Plan (2018–2020) has focussed particular attention on the management of chronic patients in line with the National Plan for Chronic Diseases³³. Specifically, the region has invested in (i) tools for population stratification and targeting, (ii) health promotion, prevention, and early diagnosis; (iii) taking charge and the management of patients through clinical patient pathways; (iv) the provision of personalised interventions; and (v) assessment of the quality of the care provided. Over time, great emphasis has been placed on patient empowerment in terms of promoting chronic disease self-management programmes (*sanità di iniziativa* Regional Decree n.650/2016 and Regional Decree n. 545/2017 ‘*Modello IDEA: incontri Di Educazione all’Autogestione delle malattie croniche*’) especially for low complexity patients where chronic disease management is adopted. However, the adoption by GPs is still heterogeneous within the local health districts of Toscana (Figure 7). This proactive approach is the preferred one the region has encouraged, also by the introduction of community and primary care nurses for chronic and non-self-sufficient patients (Regional Decree n. 597/2018 ‘*Indirizzo per lo sviluppo del modello assistenziale infermiere di famiglia e di comunità. Approvazione e destinazione delle risorse*’). Although during the COVID-19 emergency, chronic disease self-management programmes have been slowed down, there is also a need to support the development of self-management programmes for patients with complex healthcare needs, such as multi-morbidity.



Figure 7. Percentage of population (aged >16) assisted by GPs adhering to disease-self management programs, by health district (2019)

Source: Inter-Regional Performance Evaluation System of Scuola Superiore Sant’Anna (Pisa)

<https://performance.santannapisa.it/pes/network/home.php>

³³ National Plan for Chronic Diseases http://www.salute.gov.it/imgs/C_17_pubblicazioni_2584_allegato.pdf

On the other hand, more complex patients are directly treated by health workers adopting a chronic case management approach where a case manager – the GP – takes charge of the patients with chronic conditions, and defines the treatment path, plans visits, examinations, and other care needs, supporting the patient in the implementation of the entire therapeutic plan. The Individualised Care Plan (*Piano Assistenziale Individuale – PAI*) is the clinical management tool intended to improve outcomes and reduce unwarranted variation.

Emphasis on the patient and the need to re-orient the focus of care from the hospital to the patient is another critical element of service redesign. **To boost the integration of hospital and territorial services** Toscana is investing in a **Multidisciplinary Day Service** to manage non-hospitalised complex chronic patients and to provide diagnostic service packages to support the primary care professionals in early diagnosis and follow-up of chronic patients. A very recent strategy to this end has been the boost of oncological territorial services promoting care continuity and shifting the focus of care from the hospital to the patient during follow-ups (Regional Decree n. 735/2020). Moreover, to increase integration between hospital and territorial care, **Community Health Centres (*Case della Salute*) must be available as widely as possible throughout the region as facilities ensuring care proximity** and where primary care and specialists work in a collaborative way. This is a priority for Toscana also in light of the current pandemic where patients not needing hospital care should be managed by multidisciplinary teams at the territorial/intermediate care level. According to the Tuscan chronic care model, patients are taken care of by a multi-professional team coordinated by the GPs, ensuring fluidity of the paths and the necessary connections with other health services through community medicine.

Finally, the use of supporting services to ease patient access should also be enhanced. The region has implemented a specific booking system for chronic patient follow-ups, to facilitate patient access to care services and ensure clinical continuity. This action has led to the scheduling of the follow-up visits and examinations, as well as improved waiting times. Also, web-based real-time services such as e-booking and e-payments have been enhanced (see the regional app Smart SST³⁴) even though their usage is still limited. Regional-based booking centres (*Centro Unico di Prenotazione - CUP*) as a single entry point to all healthcare services is still a work in progress.

Among the patient pathways, **mental health is a weak area that needs attention** (Figure 8). Indeed, performance is low in all aspects, especially with reference to consumption of antidepressants, hospitalisation, and re-admissions for psychiatric patients.

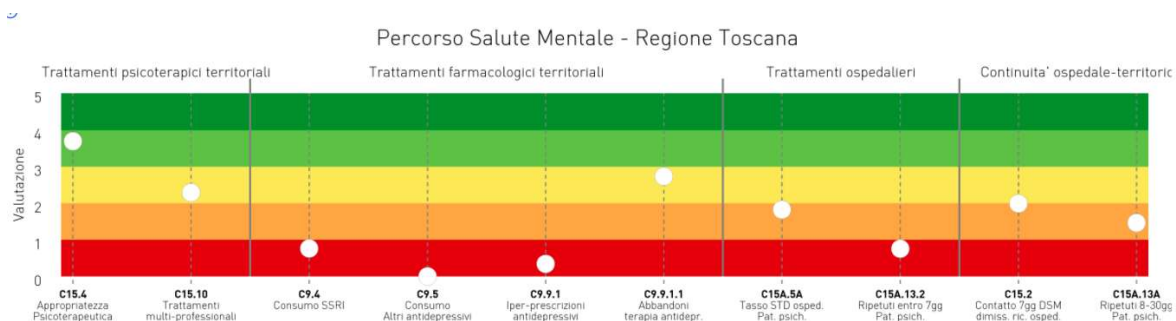


Figure 8. Performance of mental healthcare pathway in Toscana, 2019

Source: Inter-Regional Performance Evaluation System of Scuola Superiore Sant'Anna (Pisa)

<https://performance.santannapisa.it/pes/network/home.php>

³⁴ <https://www.regione.toscana.it/-/smart-sst>

As reported by an analysis performed by ARS Toscana³⁵, in the first five months of 2020 – due to the COVID-19 emergency – patients suffering from chronic conditions were followed up at a local level with less intensity compared to the same period last year, particularly with regard to outpatient care and diagnostic follow-up. On the contrary, therapeutic adherence maintained good levels thanks to the electronic prescription system implemented via SMS at the beginning of the pandemic: however, this has led to a drastic decrease in physical contacts between patients and general practitioners with negative consequences on patient-doctor relationship and dialogue. Future actions promoting innovative ways to access services should consider the risks and benefits also on patient-doctor relationship.

³⁵ <https://www.ars.toscana.it/2-articoli/4426-COVID-19-e-gestione-cronicit%C3%A0-in-toscana-prime-analisi-impatto-su-processi-esiti-e-costi.html>