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Con il contributo non condizionante di



CONGRESSO REGIONALE

AMD-SID

Abruzzo /Molise

IL DIABETE PARADIGMA DI CRONICITA'

CONTUGARE ECCELLENZA E
PROSSIMITA' DELL'ASSISTENZA

Chieti - 12 novembre 2022

**Auditorium Centro Studi e Tecnologie Avanzate
CAST**

La visione della regione
Massimiliano Petrelli



NESSUN CONFLITTO D'INTERESSE DA DICHIARARE.

Dear Max,



We would like to inform you that the material from this Marketplace is available on the Commission's webpage: https://ec.europa.eu/health/systems_performance_assessment/ev_20210601_en

The Marche's clinical network for diabetes

MARCHE REGION (ITALY)



massimiliano.petrelli@regione.marche.it

Dr. Massimiliano Petrelli

Regional Health Agency – Marche Region

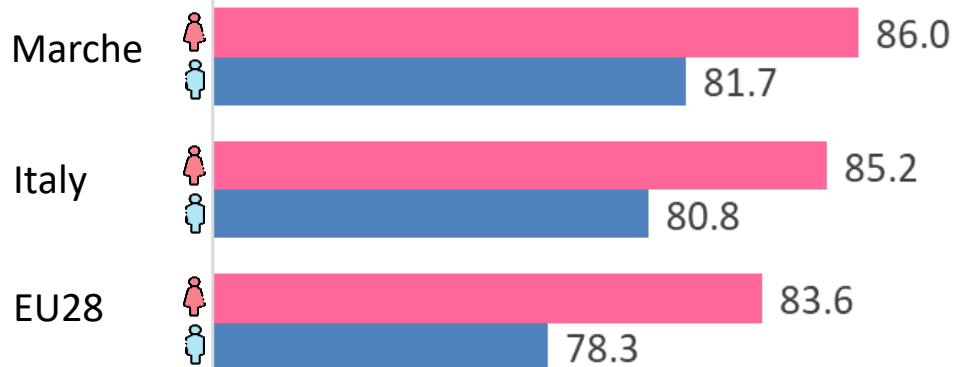
Outline

1.	Design, implementation and monitoring
2.	Obstacles & opportunities
3.	Results achieved
4.	Cost-effectiveness
5.	Success factors and transferability

1. Design, implementation and monitoring

Marche region (2)

Life expectancy at birth (y, 2018)

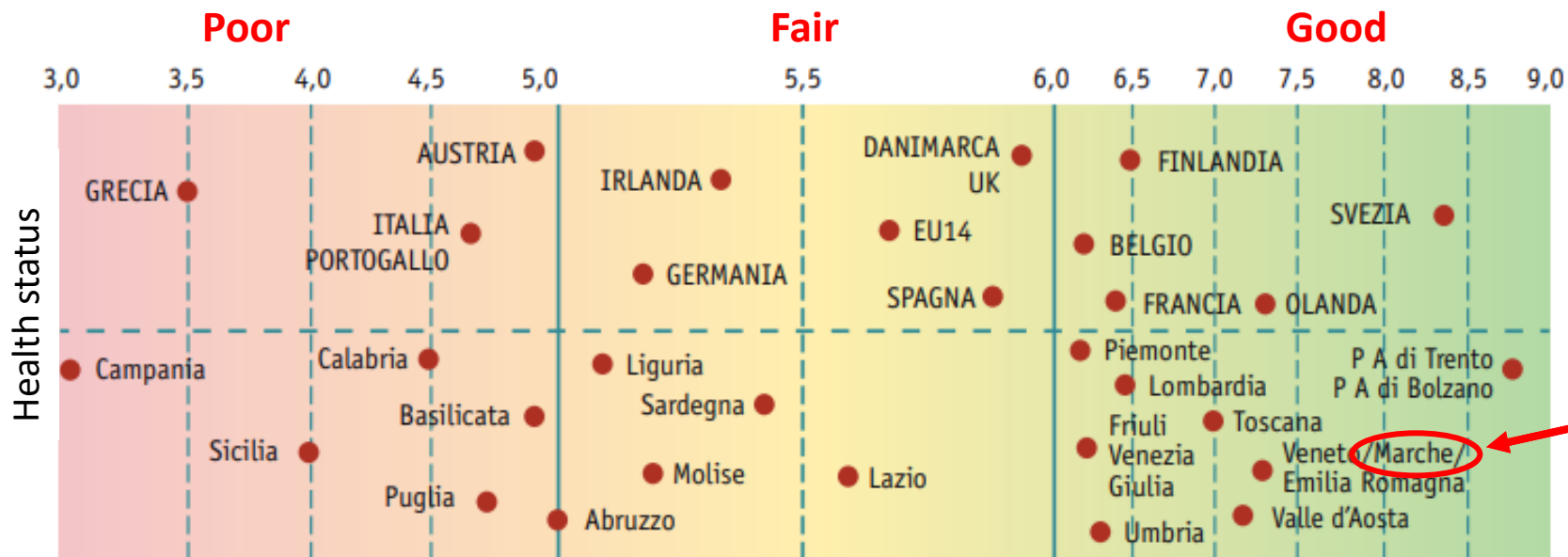


Icons made by Freepik from [Flaticon](https://www.flaticon.com/)

Healthy life expectancy at birth (y, 2018)

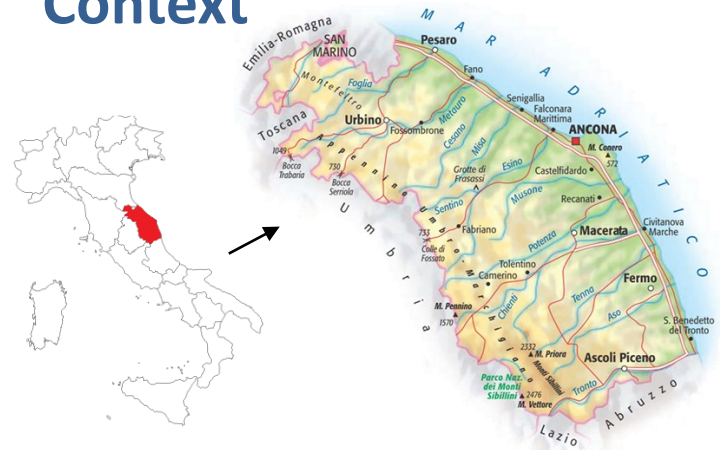
Marche	60.1
Italy	58.5

Health status in EU countries and Italian regions: index of healthy health systems



Fonte: Elaborazioni RBM Assicurazione Salute S.p.A. su dati OECD Health Data e Meridiano Sanità

Context



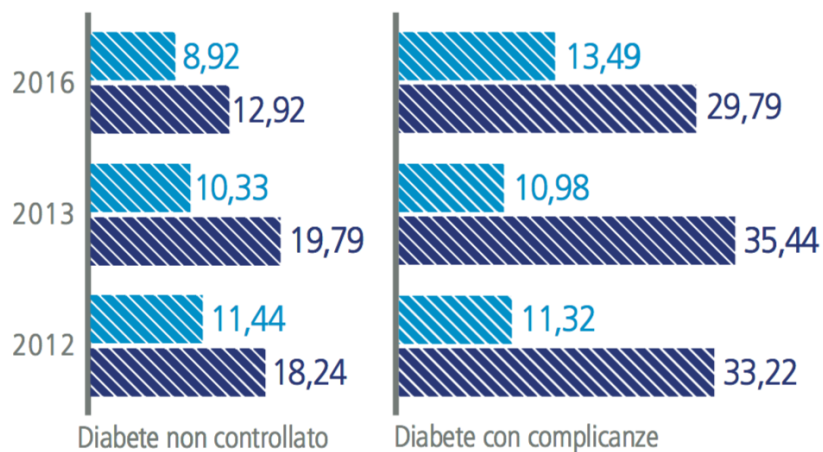
- Total population (2021): 1,501,406
- Population aged 65+: 25,4%
- The majority living in the coastal area; disadvantaged rural and mountain internal areas, strongly affected by the 2016 earthquake.



2018

Diabetes: 4.4% of population (67,925 people) (vs 5% in Italy)

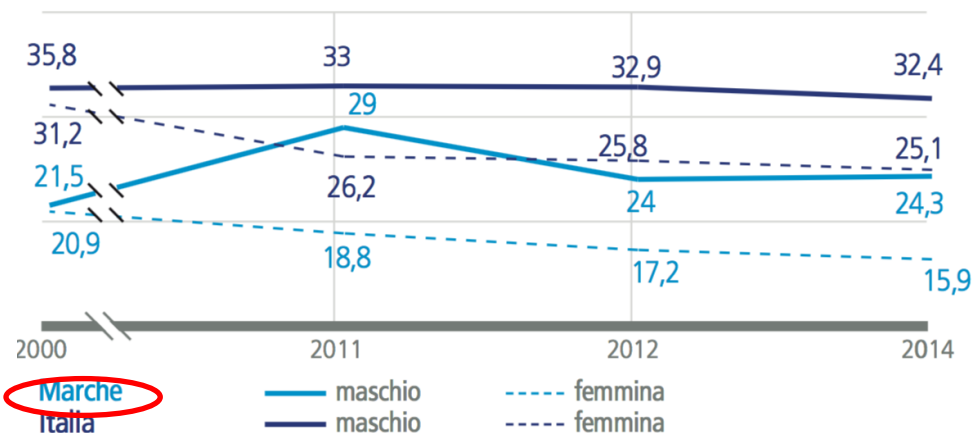
Hospitalization rates per 100,000 inhabitants



Marche

Italia

Standardised mortality rates for diabetes (males and females per 100,000 inhabitants)



Marche

Italia

maschio

femmina

maschio

femmina

Objectives

The **overall goal** of the practice is to standardise diabetes prevention, diagnosis and treatment throughout the territory, thus ensuring equity in both access to treatment and the level of care.

The **specific objectives** are:

- To develop an **integrated management model** for the prevention and management of diabetes and its complications
- To develop a **network of diabetes centres** linked through a **shared electronic patient record**
- To provide **person-centred care**, considering patients and their family's needs, culture/religion, abilities and compliance to different therapies, through a multidisciplinary team.

The diabetes network design (1)



1987: Establishment of 14 Regional Diabetes Centres (Regional Law n. 38)



National plan
for diabetes
(2012)



Regional laws, deliberations
and decrees (2012-2015)



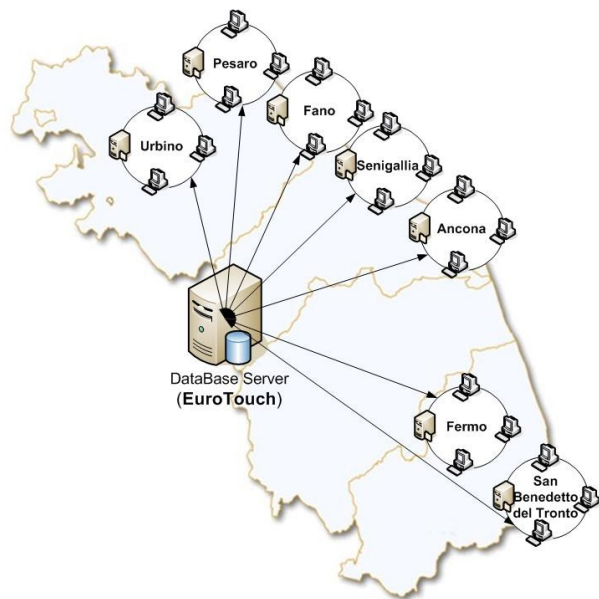
Piano sulla malattia diabetica

Network of centres, integrated management,
technologies, data dashboard, medicines,
multidisciplinary team



End of '90: need to put medical records
in computerised form and include all
patient data

The diabetes network design



Phase n. 1 - 2002

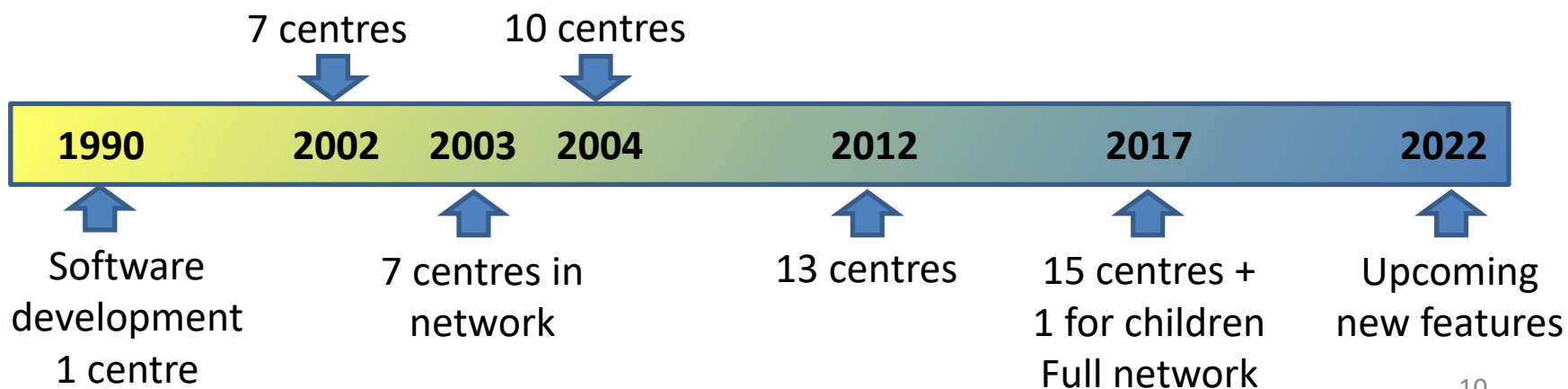
- Delivery and set-up of the regional software
- Data transfer to the regional software
- Specific training of the operators

Phase n. 2 - 2003

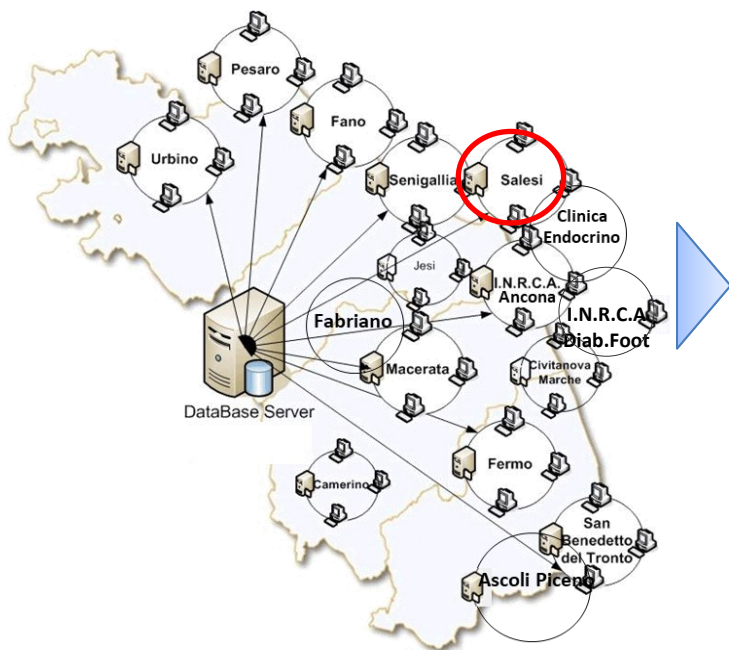
- Centres connected to the Regional Private Network
- Regional Clinical Database on protected server

Phase n. 3 - 2004

- Involvement of other diabetes outpatient centres in Marche region

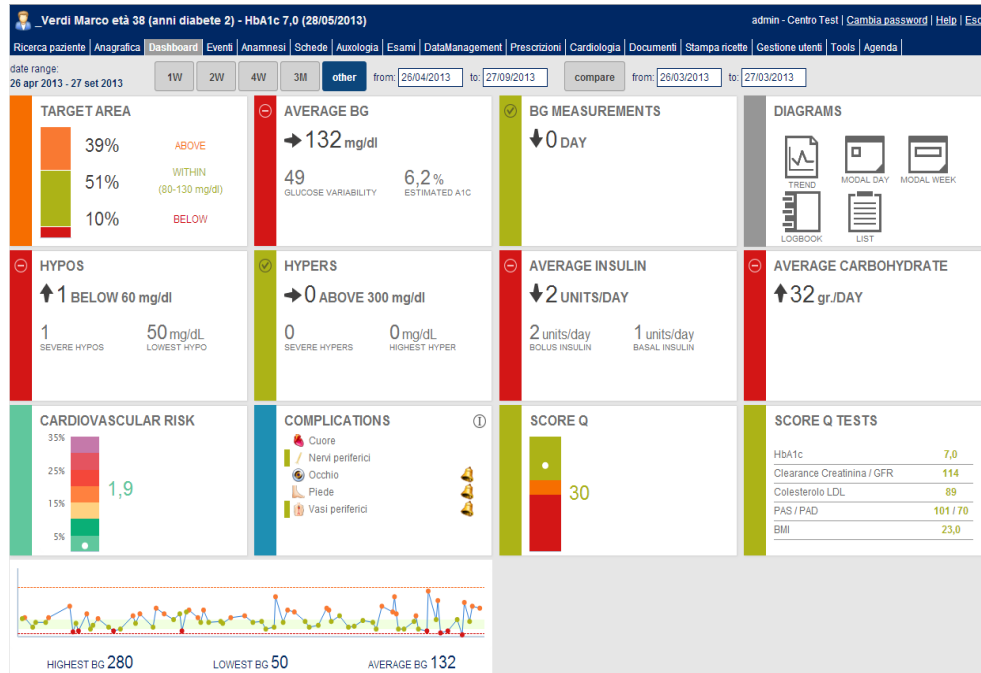


The diabetes network implementation

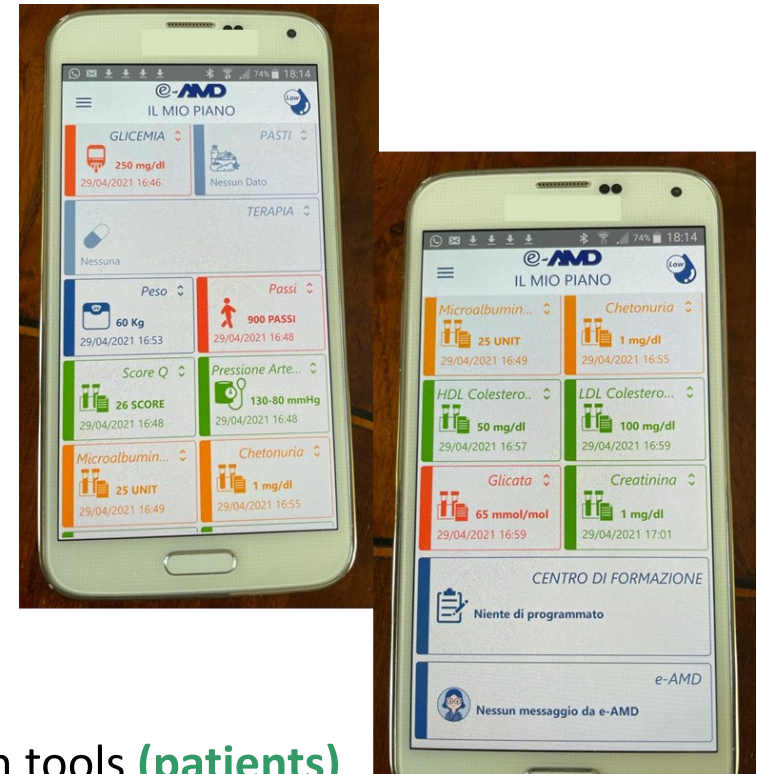


- **15 centres** for adults + **1 for children**, most with a 5- 6 days/week coverage.
- All centres use the **same shared electronic patient record** (SMART DIGITAL CLINIC by METEDA®), with data flowing into a single regional database
- The **patient's documentation** is accessible from all centres, allowing mobility throughout the region while guaranteeing data security and privacy (e.g. COVID-19 vaccination).
- Each centre is organized with a **multidisciplinary team** and **provide person-centred care**: primary care and follow-up; chronic care; health promotion; disease prevention; support to patient's associations activities.
- Specific **care pathways**, including gestational diabetes
- Other activities: courses in schools; patient education (school camps for children and adults; diabetic volunteer guide); training of operators; provision of devices.

The doctor's dashboard



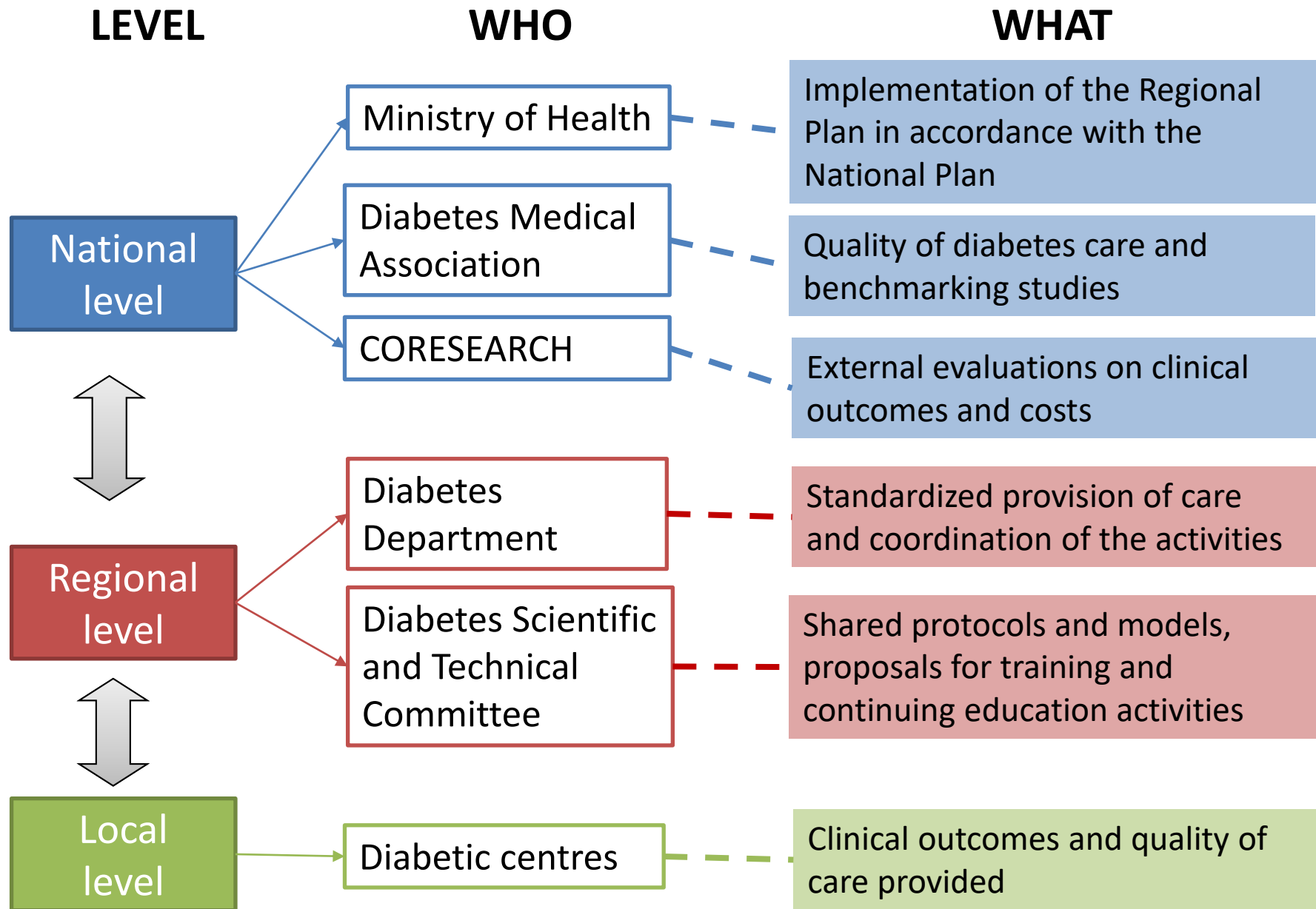
The patient's dashboard



- Summary of data
- Alerts
- Monitoring of glucometer data
- Diet/Physical activity (patients)
- Educational material (patients)
- Communication tools (patients)
- Drug prescriptions (doctors)
- Booking of other specialist services (doctors)

Activities during COVID-19: teleconsultation service; identification of patients for the COVID-19 vaccination

Monitoring and evaluation



Indicators

- A set of 77 indicators collected at National level by all centres having an electronic health folder: *process indicators, intermediate outcome indicators, care intensity and appropriateness indicators, outcome indicators*

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Score Q: quality of care

Table 1 Quality of care scoring system	
Quality of care indicator	Scoring
HbA _{1c} measurement < 1/year	5
HbA _{1c} ≥ 8.0%	0
HbA _{1c} < 8.0%	10
Blood pressure measurement < 1/year	5
Blood pressure values ≥ 140/90 mmHg, irrespective of treatment	0
Blood pressure values < 140/90 mmHg	10
Lipid profile measurement < 1/year	5
LDL cholesterol ≥ 3.37 mmol/L (130 mg/dL) irrespective of treatment	0
LDL cholesterol < 3.37 mmol/L (130 mg/dL)	10
MA measurement < 1/year	5
Not treated with ACE-inhibitors despite the presence of MA	0
Treated with ACE-inhibitors in the presence of MA or MA absent	10
Score range	0–40

Hb, hemoglobin; LDL, low-density lipoprotein; MA, microalbuminuria; ACE, angiotensin-converting enzyme.

original figure from the first article published in 2008, all data are updated following the guidelines (e.g. LDL <100 mg/dl or <70 mg/dl if CVD)

Nutrition, Metabolism & Cardiovascular Diseases (2008) 18, 57–

Quality of diabetes care predicts the development of cardiovascular events: Results of the QuED study

De Berardis G. et al.

Epidemiol. Infect. 136:1111–1118 (2008). DOI: 10.1017/S0950268808001111

Baseline Quality-of-Care Data From a Quality-Improvement Program Implemented by a Network of Diabetes Outpatient Clinics

Rossi M.C.E. et al.

Comparative Study > Diabet Med. 2014 May;31(5):615–23. doi: 10.1111/dme.12366. Epub 2013 Dec 24.

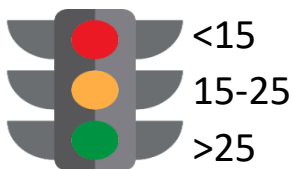
Improving quality of care in people with Type 2 diabetes through the Associazione Medici Diabetologi-annals initiative: a long-term cost-effectiveness analysis

C B Giorda¹, A Nicolucci, F Pellegrini, C K Kristiansen, B Hunt, W J Valentine, G Vespasiani

> Diabetes Care. 2011 Feb;34(2):347–52. doi: 10.2337/dc10-1709.

Quality of diabetes care predicts the development of cardiovascular events: results of the AMD-QUASAR study

Maria C E Rossi¹, Giuseppe Lucisano, Marco Comaschi, Carlo Coscelli, Domenico Cucinotta, Patrizia Di Blasi, Giovanni Bader, Fabio Pellegrini, Umberto Valentini, Giacomo Vespasiani, Antonio Nicolucci, AMD-QUASAR Study Group



2. Obstacles & opportunities

Obstacles...

...and how they have been overcome

Resistance to digitalisation in some centres	Awareness activities + turnover
Low digital skills of the operators	Training courses and evidence of time-saving and improved outpatient performance
System interoperability	Progress of the connections and the uniformity of operating systems
Sustainability Annual cost = €50,000 (use and routine maintenance) + €10,000 (extraordinary updates).	A stable funding from the regional health system budget and a minimal non-conditional financial support by sponsors (companies in the field). Institutional support from the Region and stable human resources in all centres

3. Results achieved

PROTOCOLS/OPERATIVE PLANS

- Guidelines for the integrated management of diabetes (2013)
- Protocol for admission of patients in the Centres and care pathways (2019)
- Protocol for the management of gestational diabetes (2019)
- Protocols of interventions in schools (2010-2014-2017)
- Guidelines on use and prescriptions of technologies and drugs (2010-2017)
- Establishment and promotion of the “Diabetic guide”(2019)
- Protocol on diabetes and sport (2019).



TRAINING OF THE PROFESSIONALS (yearly)

- 1 regional congress
- 2 thematic workshops on specific aspects,
- 2 Regional Committee meetings



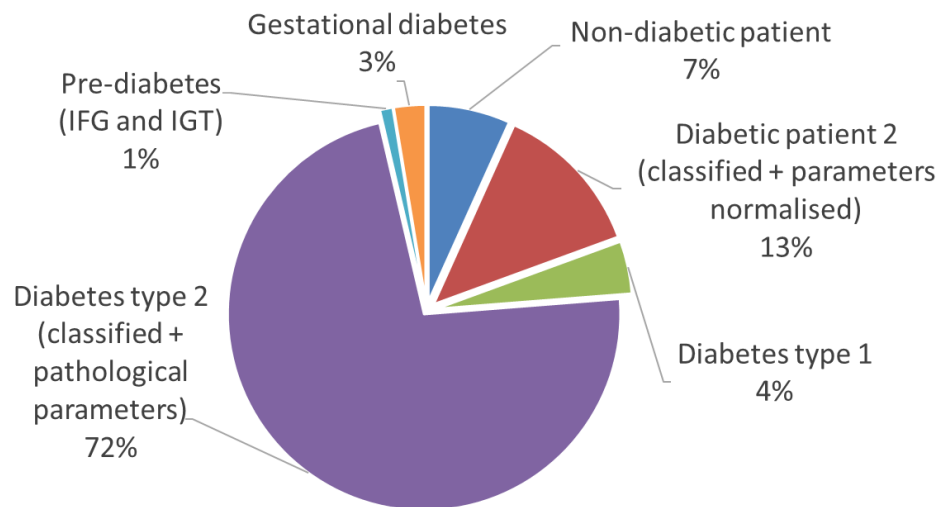
PROJECTS/INTERVENTIONS OF PREVENTION AND EDUCATION OF PATIENTS/CAREGIVERS

- Activities in schools: courses for teachers and school staff, training activities with pupils
- Patient education: school camps for children and adults; diabetic volunteer guide (trained to work with GPs and diabetes services to disseminate correct information on lifestyles, daily diabetes management, self-monitoring and self-management of diabetes)



Patients and activities

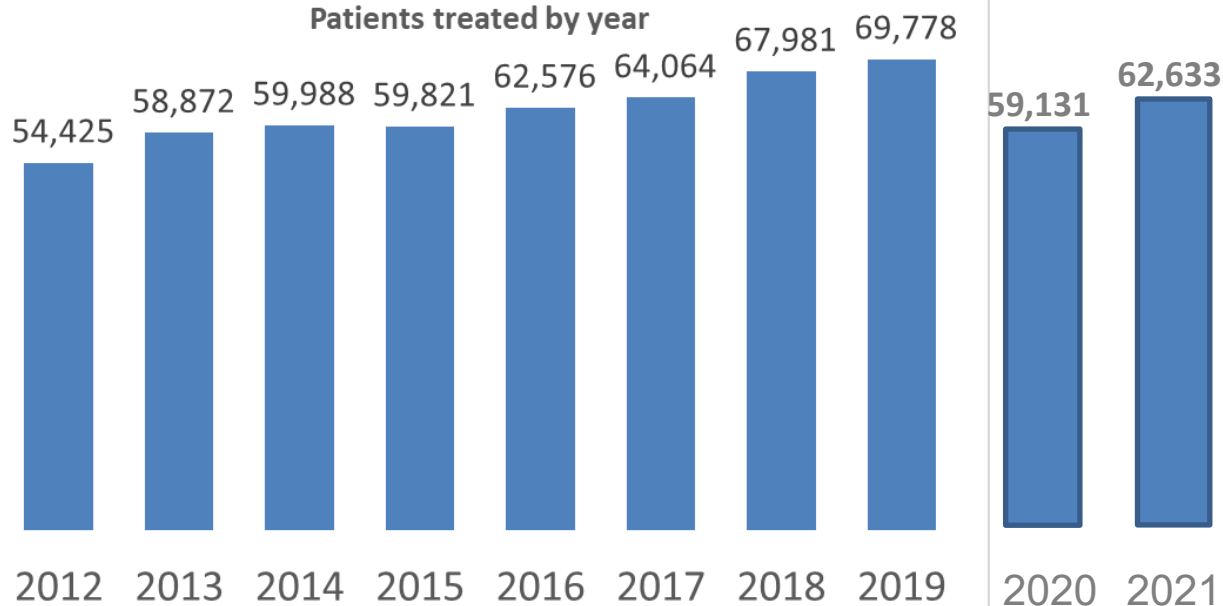
Patients by condition (2019)



Activities (2019)

MEDICAL EXAMINATIONS	138,512
EDUCATIONAL THERAPY	62,368
BLOOD TESTS	141,802
OTHER ACTIVITIES	36,811
TOTAL	379,493

Patients treated by year



Indicator	2011 (%)	2016 (%)	Delta 2016-2011 (%)	
N	23,502	28,993	5,491	
Glycated haemoglobin (HbA1c) assessment	96.5	98.7	2.2	
Lipid profile (LDL) assessment	59.3	59.1	-0.2	
Blood pressure (BP) assessment	64.7	74.2	9.5	
Albuminuria assessment	58.2	69.3	11.1	
Retinopathy monitoring	35.8	36.6	0.8	
Foot examination	31.3	31.5	0.2	
HbA1c ≤7,0%	44.6	48.1	3.5	
HbA1c >8,0%	23.4	20.8	-2.6	
HbA1c >9,0% despite treatment with insulin	23.1	18.2	-4.9	
C-LDL <100 mg/dl	48.2	56.1	7.9	
C-LDL ≥130 mg/dl	19.7	16.3	-3.4	
C-LDL ≥130 mg/dl not treated with statins	56.4	54.4	-2.0	
C-LDL ≥130 mg/dl despite treatment with statins	15.5	12.5	-3.0	
Blood pressure <140/90 mmHg	55.0	58.3	3.3	
Blood pressure ≥140/90 mmHg	45.0	41.7	-3.3	
Blood pressure ≥140/90 mmHg not treated	25.6	25.0	-0.6	
Blood pressure ≥140/90 mmHg despite treatment	51.0	43.9	-7.1	
Hypolipidemic treatment	46.1	52.4	6.3	
Antihypertensive treatment	60.4	64.6	4.2	
Score Q <15	3.9	4	0.1	
Score Q >25	49.1	54.7	5.6	
Body-mass Index (BMI) ≥30 Kg/m2	41.4	41.1	-0.3	
Smokers	15.5	16.4	0.9	

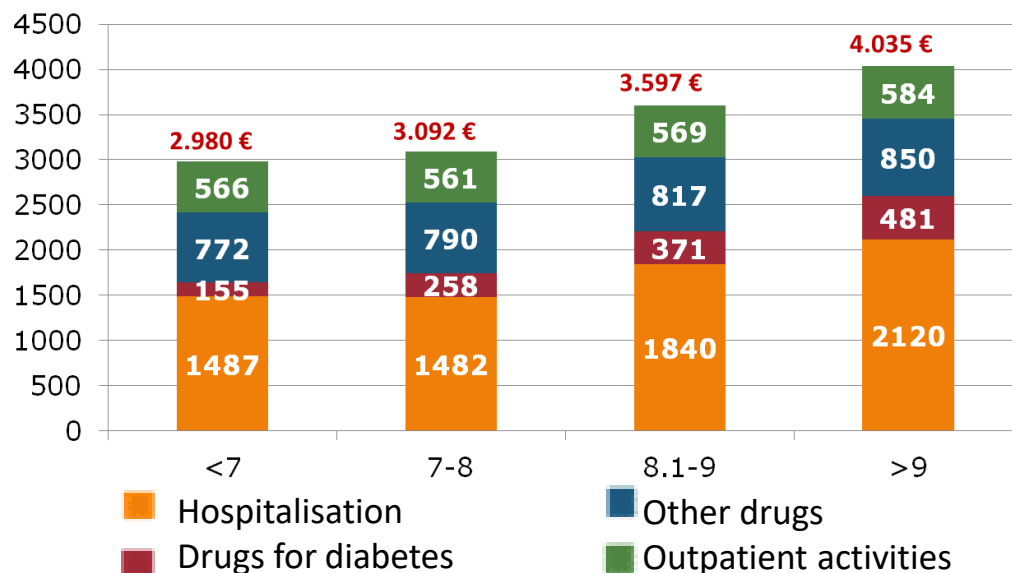
Outcomes

- 28% reduction of **hospital admissions**
- improvement in **quality of life** (according to questionnaires filled in by patients)
- 100% of people **supported in community/outpatients** settings
- **Waiting times** for non-urgent consultations: within 24 hours by e-mail or for pregnant women; 2 weeks for face to face.
- **Patients satisfaction** in terms of: quality of care; timing of visits; numbers of additional examinations (e.g. ECG, Fundus Oculi, etc.)
- **Patient outcomes** indicators: if compared to others Italian Regions we recorded improvement of HbA1c, reduction of cardiovascular risk; improvement of Blood Pressure control; reduction of foot ulcers complications; reduction of mortality.

4. Cost-effectiveness

Evaluation study: clinical and costs outcomes

Data from 45,284 patients (clinical & administrative data, 2007-2012)



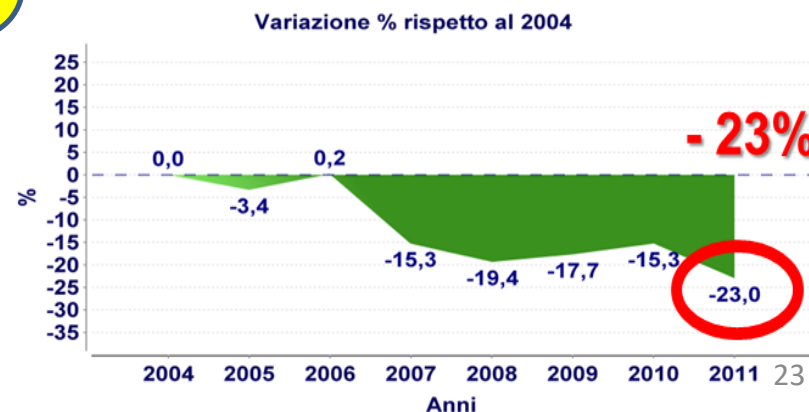
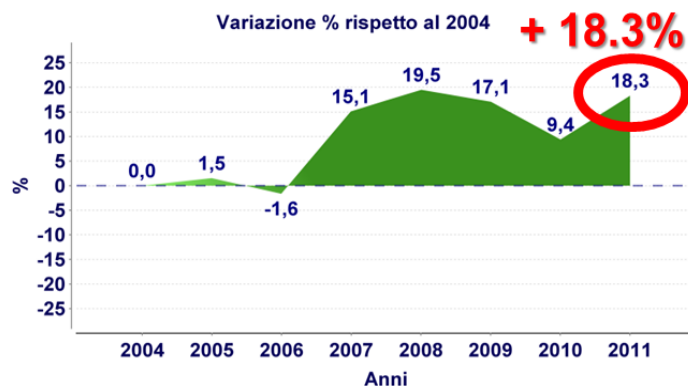
Average annual cost per patient for hospitalization and drug treatment according to % HbA1c levels

HbA1c: intermediate outcome indicators (% variation 2004-2011)

Subjects with HbA1c ≤ 7.0%

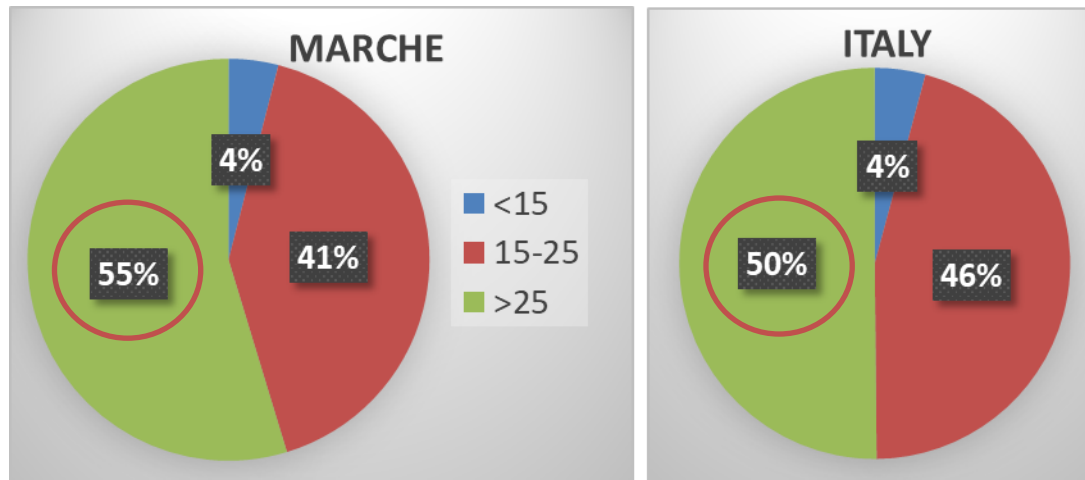


Subjects with HbA1c > 8.0%



Cost-effectiveness

Score Q: MARCHE vs ITALY

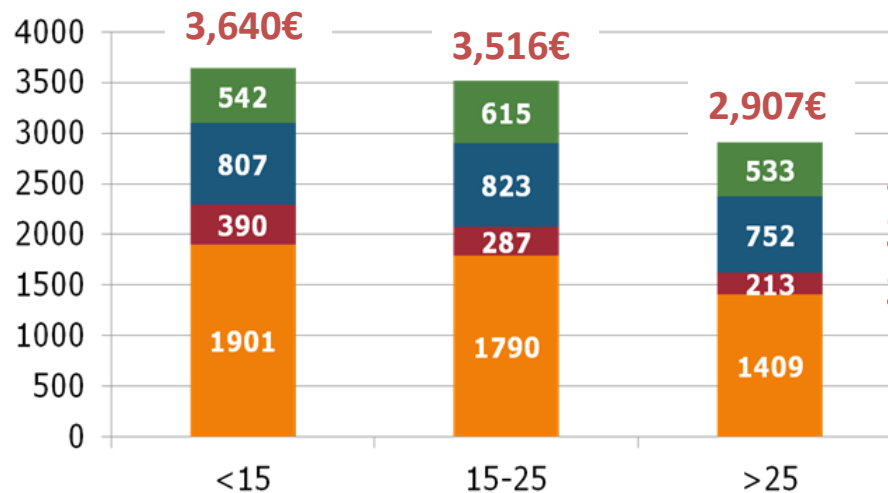


Score Q MARCHE

	2011 (%)	2016 (%)	Delta 2016-2011 (%)
Score Q <15	3,9	4	0,1
Score Q >25	49,1	54,7	5,6



Average annual cost per patient based on Q score



5% of 67,981 = 3,399 patients

3,516 - 2,907 = 609 € (savings per patient)

3,399 * 609 = 2,069,991 € (total annual savings)

5. Success factors and transferability

Success factors

- Software created by an experienced diabetologist based on the **needs of the patients** and **designed specifically for diabetes**
- Software **continuously revised** according to the feedback and experience of all diabetologist and the evolution of clinical guidelines
- A group of diabetologist and stakeholders willing to **cooperate**
- Involvement and support of **all stakeholders**
- Presence of a **regional officer** who supported the development of the network
- **Limited** costs
- Having a **single database**, it's easiest to calculate improvements or critical points in the diabetes treatment

Transferable elements

1. The **software** - a complete and organized folder divided in schedules that analyse and involve every single aspect of diabetes and its complications.
2. The **model** - model of care, governance, and evaluation tools.
3. The **network** – how to connect the centres in a local/regional/national network.

The practice has already been transferred to Umbria region (Italy) and by 2022 it should also be operative in the Sardinia region (Italy).

Requirements to transfer the practice...

- A number of **diabetes centres** (not necessarily networked)
- An experienced diabetologist with **basic digital skills**
- Support from the **governance bodies** (also important for the sustainability)
- A system to ensure **data protection** and privacy

Lessons learned...

- Stipulate a contract with the software house which includes also **assistance and upgrades**.
- The importance of **the interoperability of the different systems** to avoid difficulties in integrating with important stakeholders such as the GPs (currently under development, thanks to the implementation of the EHR and the push for digitalisation caused by COVID-19).
- The importance of a **digitalised healthcare workforce**, services and systems.

Acknowledgements

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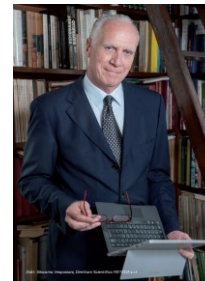
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Creator of the Diabetic centres



Dr. Franco Stazio
Regional Health Agency officer



Dr. Giacomo Vespasiani, MD
Creator of the software and network

**At last,
he finished!!**

Thank you for your kind attention!

