

# Care coordination of complex chronic patients by family doctors: the Italian CReG program

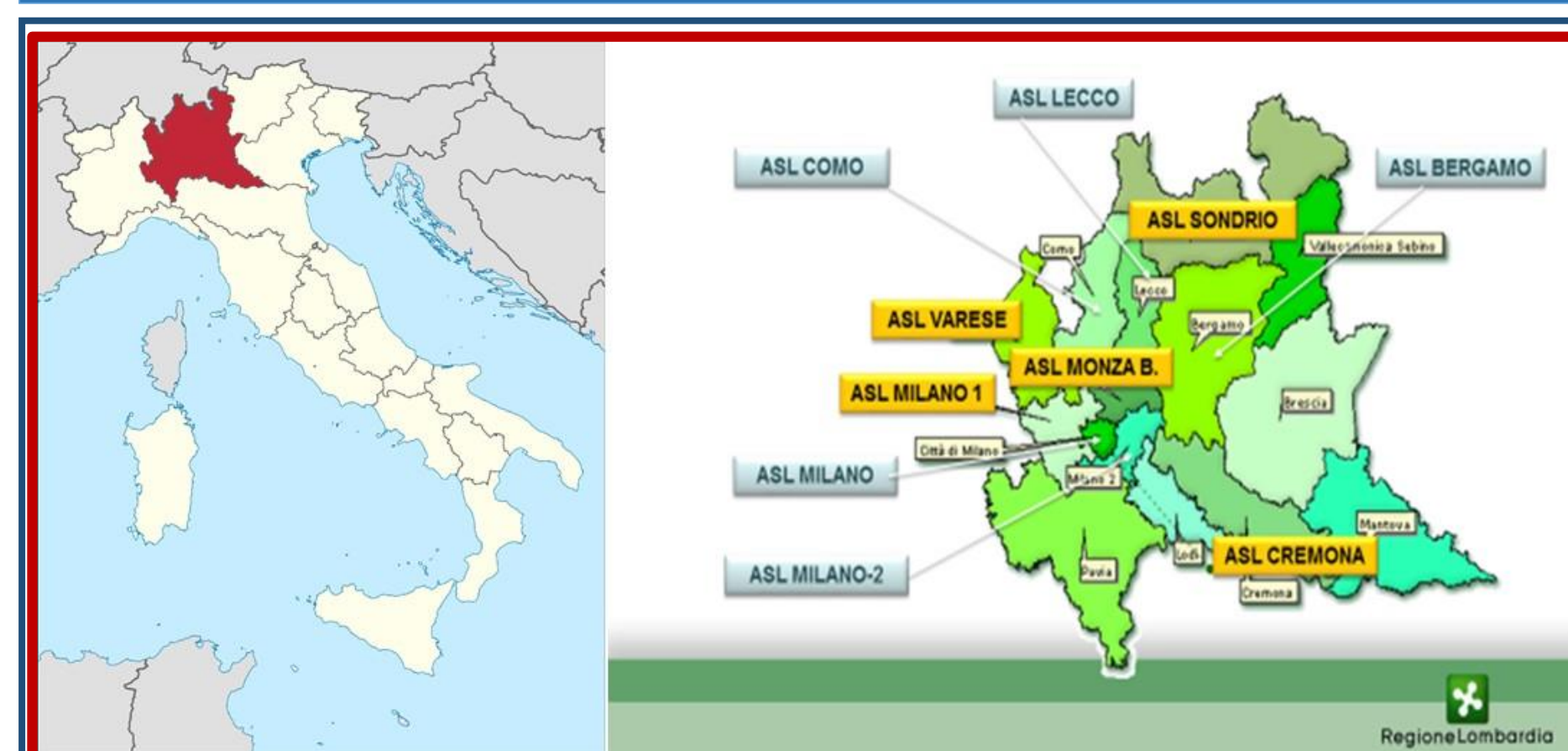
Gabriella Levato<sup>1</sup>, Fiorenzo Corti<sup>1</sup>, Maria Romano<sup>2</sup>, Anna Pozzi<sup>3</sup>, Mario Sorlini<sup>4</sup>, Davide Lauri<sup>5</sup>

<sup>1</sup>Federazione Italiani Medici di Medicina Generale (FIMMG) Lombardia, Milano, Italy; <sup>2</sup>Telbios, Milano, Italy; <sup>3</sup>Iniziativa Medica Lombarda (IML), Melegnano, Italy; <sup>4</sup>IML, Bergamo, Italy; <sup>5</sup>Cooperativa Medici Milano Centro (CMMC), Milano, Italy.

## BACKGROUND

With almost 10 million inhabitants Lombardy region represents 1/6 of the Italian population, with over 4.6 million chronic patients most of them elderly and affected by 3 or more pathologies. Chronic diseases are a challenge for the sustainability of the national and regional health system. In 2011 the Lombardy's government launched the **Chronic Related Groups (CReG)** program to promote continuity of care for chronic patients. CReG is a group of pre-defined economical resources assigned to an institutional subject (CReG Provider) to guarantee the delivery of an established treatment plan to chronic patients, to provide them with a comprehensive care outside the hospital. The main pathologies involved are Chronic Obstructive Pulmonary Disease (COPD), hypertension, heart diseases and diabetes. The CReG providers are cooperatives of General Practitioners (GPs) located in 10 different Local Health Authorities (ASL) (Fig. 1). The CReG model is based on three pillars:

1. Technological infrastructure to identify and stratify the chronic patients.
2. The individual care plans (ICP) and medical guidelines.
3. A new reimbursement system for CReG Providers.



Local Health Authority (ASL)	Cooperatives of GPs	GPs involved	Estimated patients enrolled
10	19	1008	190,000

Fig. 1. Map of the Lombardy Region areas and Local Health Authorities (ASL) involved in the CReG project. The total number of GPs participating to the study and the patients enrolled are listed in the table.

## CReG: THE "BUONGIORNO CReG" PROGRAM

### 1. THE Buongiorno CReG PROGRAM

Four of the main GPs cooperatives active in the project (300 GPs and 52,000 patients involved) selected as technological partner Telbios, a telemedicine company operating in Lombardy. Telbios supports the cooperatives with the same IT platform including:

- A decision support system in the creation of ICP.
- A service center to monitor the adherence to ICP and supporting telemedicine and telemonitoring activities.
- The data analysis and report.

Patients enrolled in «Buongiorno CReG» Project are mainly affected by hypertension, diabetes and cardiovascular diseases (Fig. 2).

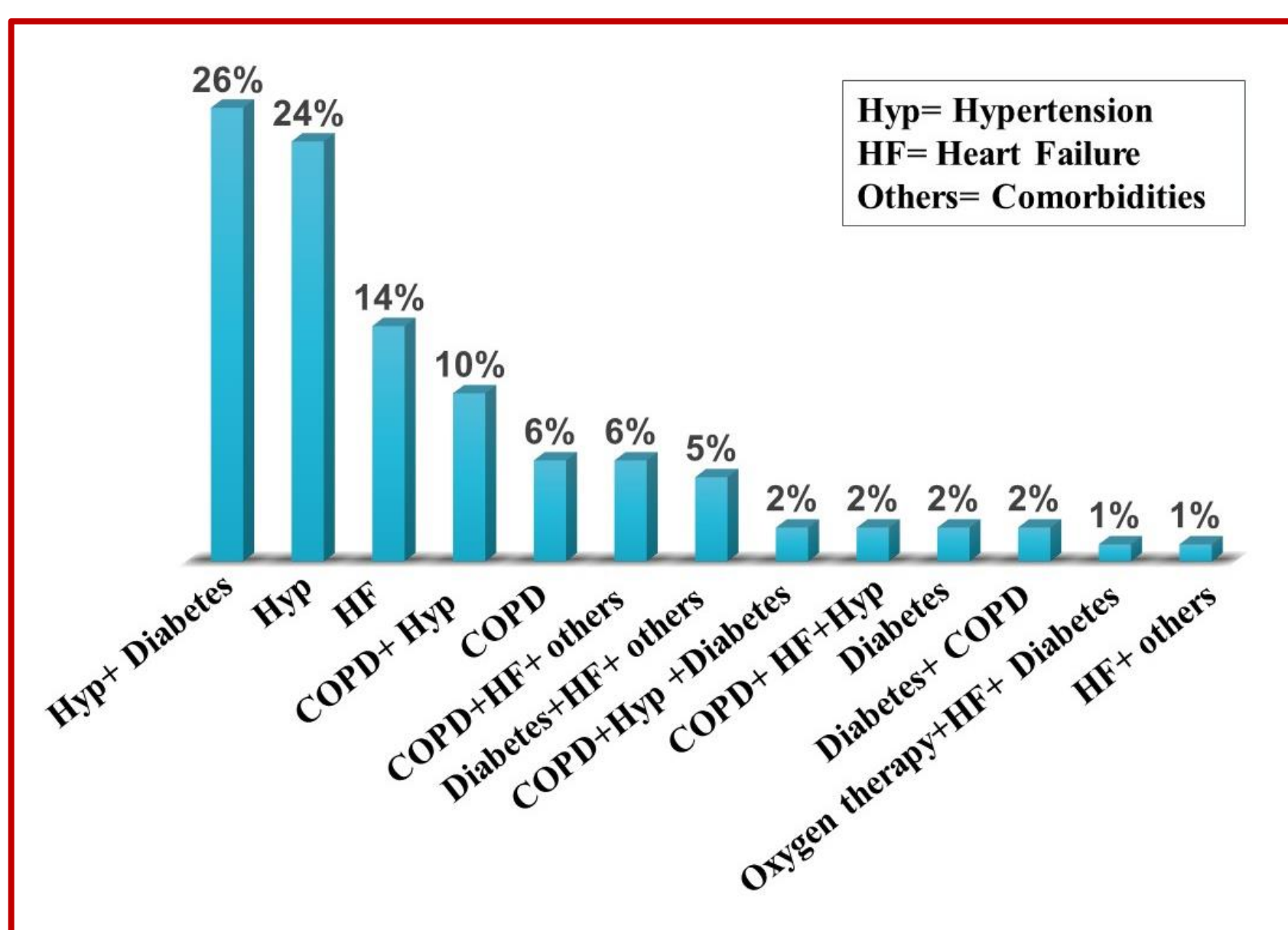


Fig. 2. Pathologies and comorbidities of patients enrolled by the 4 GPs cooperatives supported by Telbios (CMMC, IML Bergamo, IML Melegnano, MMG CReG Como).

### 2. TELEMEDICINE AND TELEMONITORING

Innovative technological devices have been employed in the project. Thirty GPs offices (serving 60 GPs/12,000 patients) are equipped with **telemedicine** stations (telecardiology and spirometry). The use of telemedicine started in 2013 and significantly increased with a growth rate of 101% for telecardiology (Fig. 3).

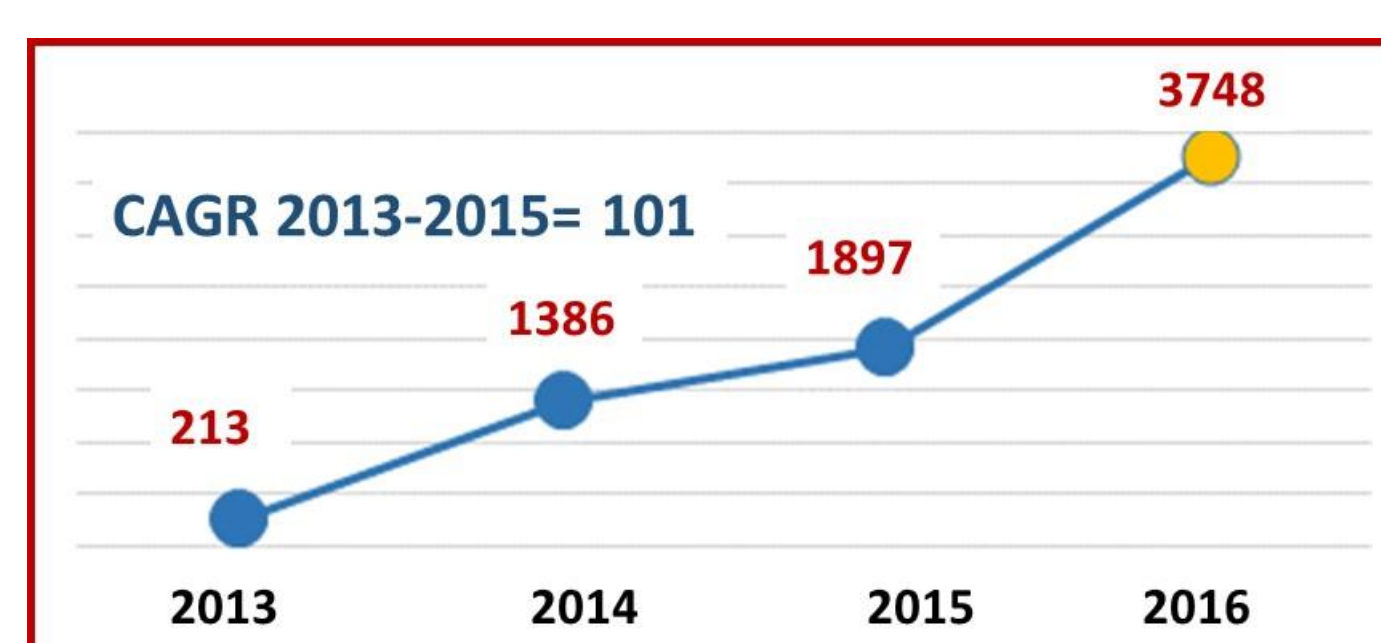
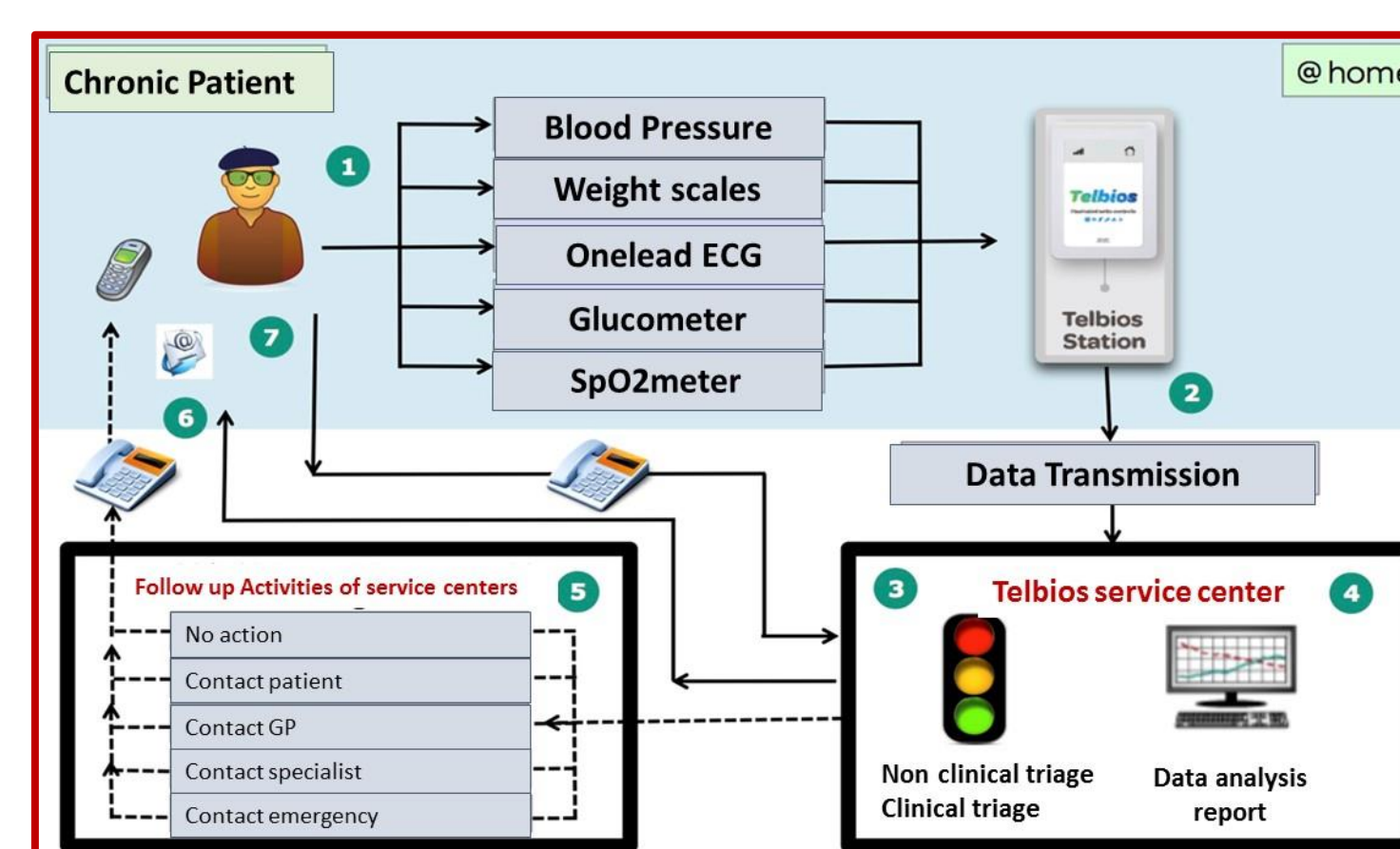


Fig. 3. Numbers of teleECG performed by GPs from 2013 up to June 2016 and Compound Annual Growth Rate (CAGR) determined for the 2013-2015 lapse of time.

The use of **telemonitoring** started in 2013 with 20 GPs and 100 more complex patients affected by diabetes and heart failure.

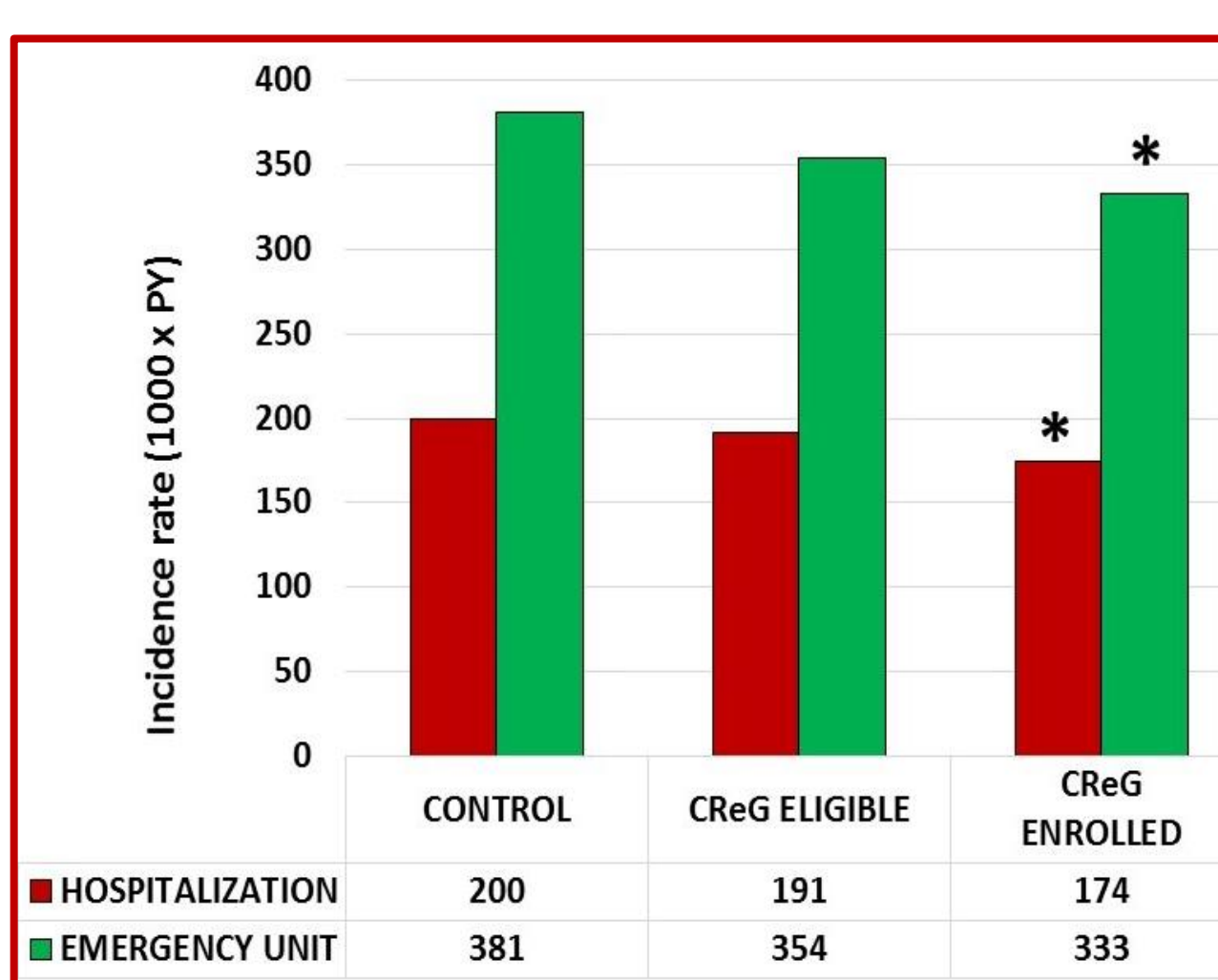


Based on the positive clinical results obtained, in 2016, 50 GPs participate to the project, with 500 patients involved.

Fig. 4. Work flow of the care steps of a telemonitored chronic patient.

## CReG RESULTS and CONCLUSIONS

The Lombardy authorities performed a data analysis on the rate of hospitalization and Emergency Department access of the chronic patients enrolled and eligible in CReG program from 2011 to 2013.



A significant reduction of both parameters, compared to patients affected by the same chronic diseases not participating to the project (Control) has been observed (Fig. 5). Promising similar results are emerging from the ongoing home telemonitoring project.

Fig. 5. Incidence of hospitalization and access to Emergency unit. \*p<0.001 vs. Control.

Clinical data obtained from a cohort of diabetic patients (Table 1) and subjects affected by cardiovascular diseases enrolled in CReG, suggest a progressive improvement of clinical outcomes.

CLINICAL INDICATORS	CLINICAL OUTCOME RESULTS RELATED TO 930 PATIENTS AFFECTED BY TYPE II DIABETES				
	DEC 2011	JAN 2013	JAN 2014	JAN 2015	JAN 2016
PA<130/85	218 (26,3%)	241 (29,1%)	256 (30,4%)	387 (41,5%)	399 (43,0%)
Glycated Hb<7 mg/ml	468 (55,7%)	497 (60,0%)	510 (60,7%)	640 (68,7%)	658 (70,7%)
LDL CHOL<100 mg/dl	122 (14,7%)	126 (15,2%)	130 (15,5%)	286 (30,7%)	280 (30,1%)
total CHOL<190 mg/dl	356 (42,3%)	379 (45,2%)	380 (45,2%)	512 (54,9%)	568 (61,0%)
Microalbuminuria<30	359 (43,3%)	424 (51,1%)	390 (46,4%)	513 (55,0%)	510 (54,8%)
Creatinine<1.20	609 (73,5%)	661 (79,7%)	680 (80,9%)	820 (88,0%)	821 (88,2%)

Table 1. Time course of the clinical outcome results obtained from a cohort of diabetic patients. Data are from 15 GPs of CMMC.

**CONCLUSIONS:** CReG is one of the largest experience in Europe of care coordination and TeleHealth. The preliminary results suggest that this model improves the quality of care and life of chronic patients in Lombardy. CReG demonstrates the efficacy of GPs in the management of complex chronic patients.