



# Sunfrail

## Emilia-Romagna Region

**Imma Cacciapuoti**

**Naples, 27 October 2016**



# Primary Health Care



*...the provision of universally accessible, person-centered, comprehensive health and community services provided by a*

*team of professionals*

*accountable for addressing a large majority of personal health needs.*

*These services are delivered*

*in a sustained partnership*

*with patients and informal caregivers,*

*in the context of family and community,*

*and play a central role in the overall coordination and continuity of people's care...*

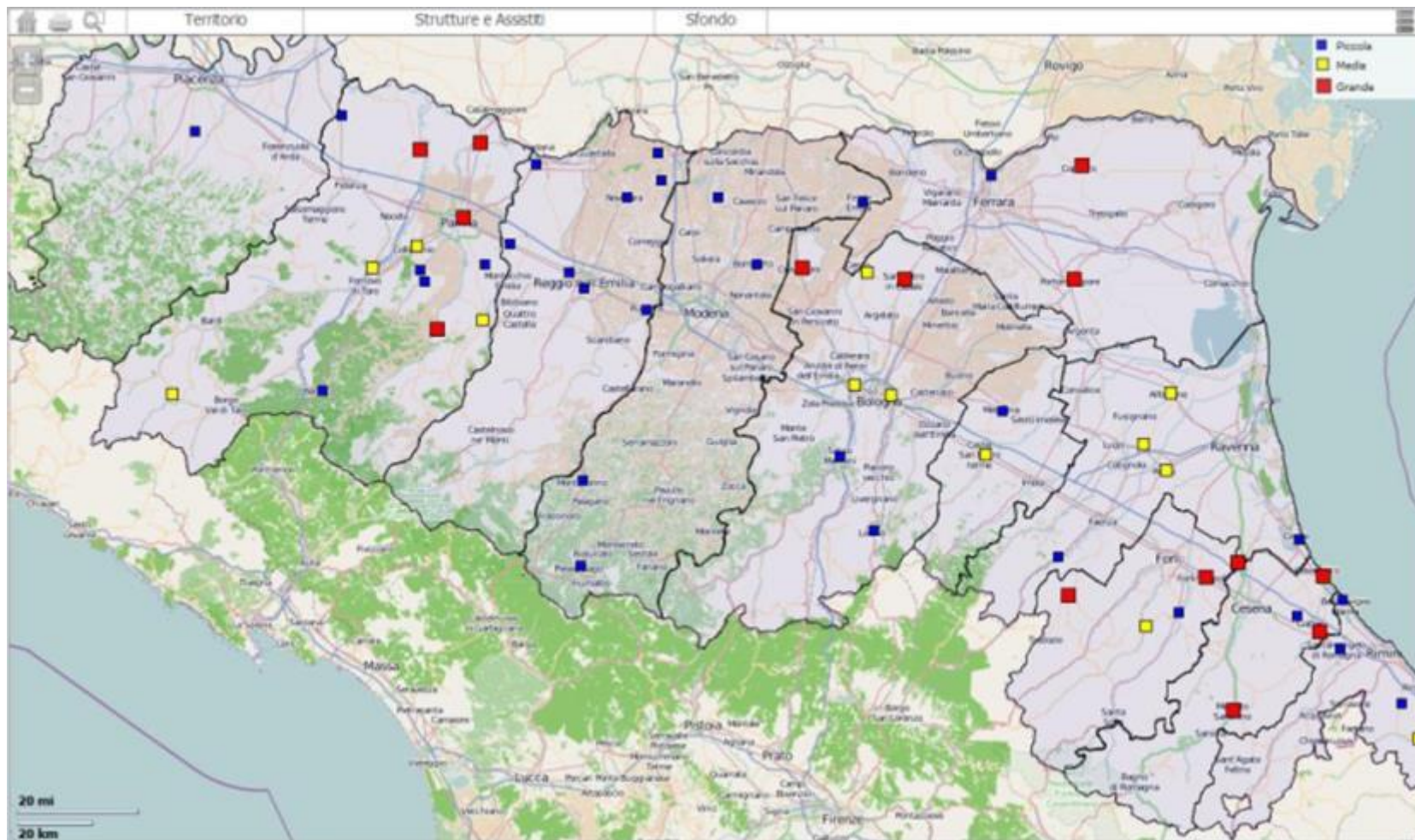


# Community Health Centers

- single point of access for citizens
- continuity of care,
- coordination of responses for citizens
- integration with the hospital
- integrated handling of patients with mental health problems
- prevention programs
- promotion of citizens' participation
- ongoing education and training for healthcare workers



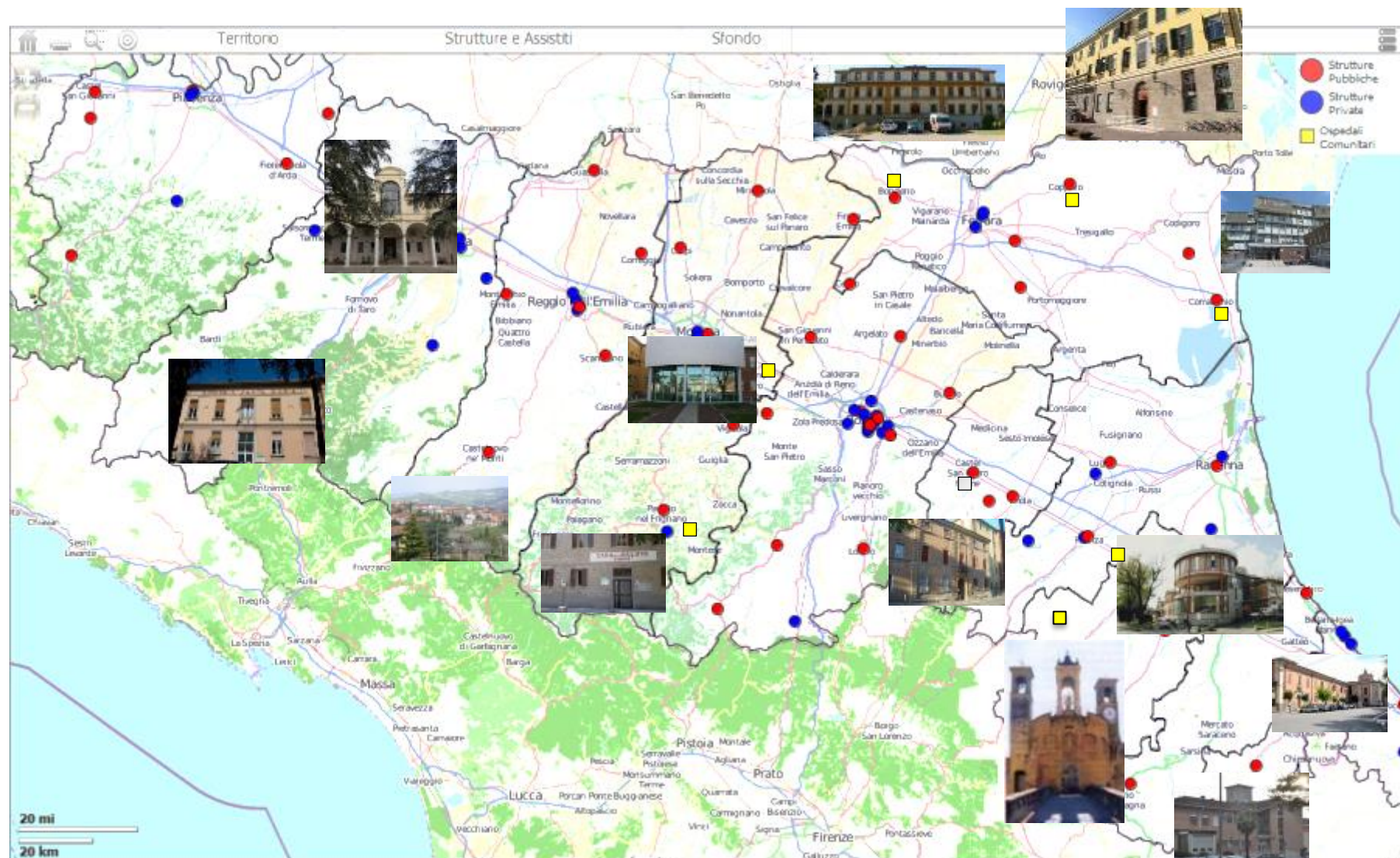
# 84 Community Health Centers (Casa della Salute) 1.9 million residents







# 13 Nurse managed Community Hospitals





# Community Hospital

- unique **model**
- **nurse managed**
- limited number of beds (usually less
- clinical responsibility with **GPs** or Local Health Unit physician
- involvement of physiotherapists and careworkers

## Type of care

- nursing care
- rehabilitation (physical, respiratory and cognitive)
- promotion of patient **empowerment and self-management**
- **care giver** training





# Integrated Care

*Multidisciplinary, Integrated, and Participated Pathways of Care*

*Ambulatory  
(Nurse-Based)  
Care for Chronic  
Diseases*

**All in One...**

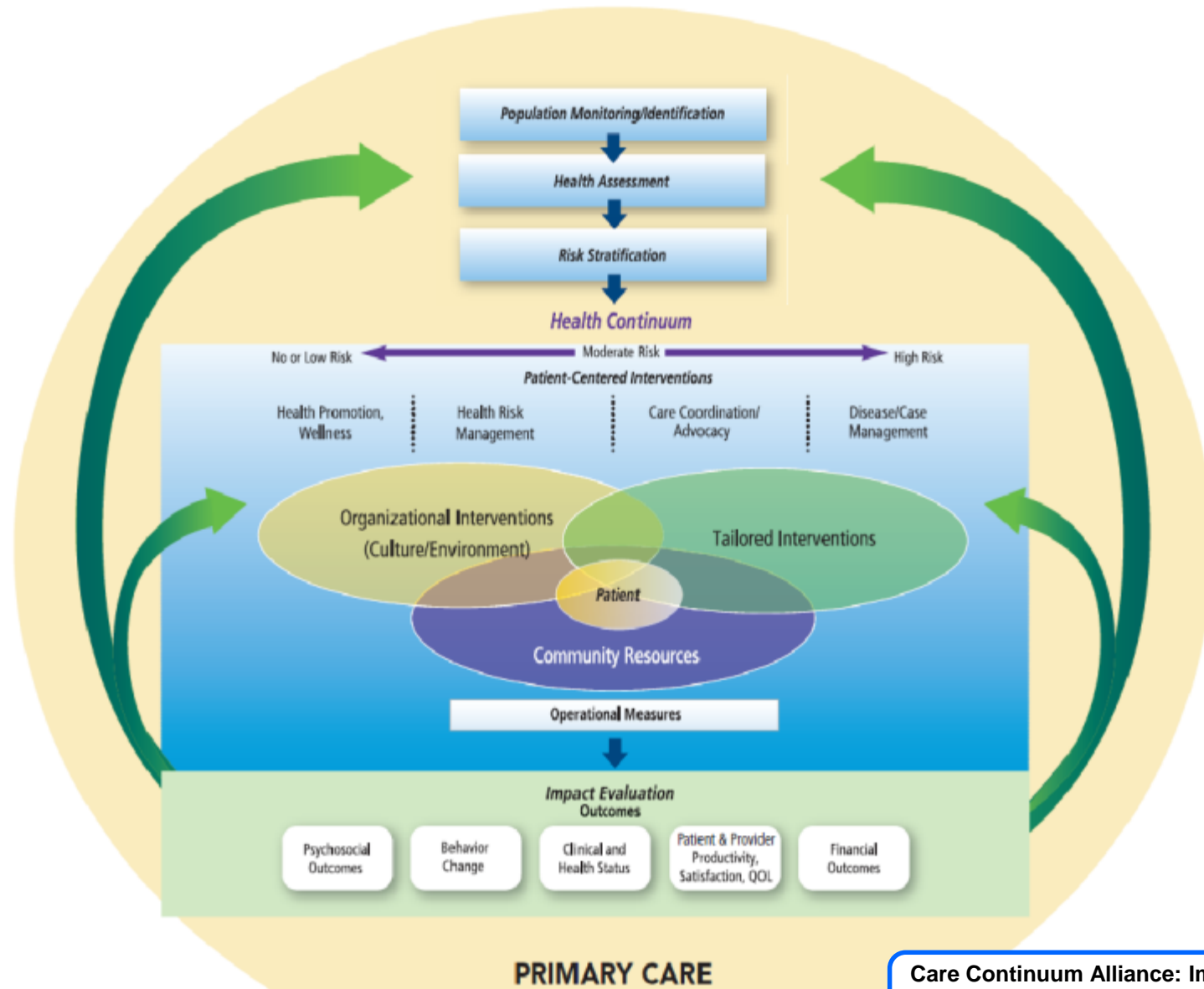
**Community  
Hospitals**

**Integrated  
Home-Based Care**





# Population Health Management







## A Regional Predictive Model

- **predictive model** to identify patients at high risk of hospitalization and Frailty
- **'patient risk profiles'** providing information on high-risk patients to the general practitioners (GPs) and nurses in the Case della Salute (Community Health Centers-CHC).
- **assessment** of the extent to which this model provides additional information useful for identification of patients who may benefit for case management or disease management purposes



# A Regional Predictive Model (II)

- risk of hospitalization
- adult population of the Region
- use of regional health/administrative data
- calculate the **Risk Score**
- high level of **statistic accuracy** ( $C = 0.85$ )

## BMJ Open Predicting risk of hospitalisation or death: a retrospective population-based analysis

Daniel Z Lewis,<sup>1</sup> Mary Robertson,<sup>1</sup> John McAra,<sup>2</sup> Vittorio Maio,<sup>2</sup> Scott W Keith,<sup>3</sup> Mengdan Liu,<sup>1</sup> Joseph S Gonnella,<sup>1</sup> Roberto Gini<sup>4</sup>

To cite: Lewis DZ, Robertson M, McAra J, et al. Predicting risk of hospitalisation or death: a retrospective population-based analysis. *BMJ Open* 2014;4:e005223. doi:10.1136/bmjopen-2014-005223

• Predictability history and additional material is available. Its view please visit the journal (<http://dx.doi.org/10.1136/bmjopen-2014-005223>).

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Accepted 3 September 2014

**ABSTRACT**  
**Objective:** Develop predictive models using administrative healthcare database that provide information for Patient-Centered Medical Homes to proactively identify patients at risk of hospitalisation for conditions that may be impacted through improved patient care.

**Design:** Retrospective healthcare utilisation analysis with multivariate logistic regression models.

**Data:** A population-based longitudinal database of residents served by the Emilia-Romagna, Italy, health services in the years 2004–2012 including demographic information and utilisation of health services by 3 726 380 people aged  $\geq 18$  years.

**Outcome measures:** Models designed to predict risk of hospitalisation or death in 2012 for problems that are potentially avoidable were developed and evaluated using the area under the receiver operating curve (C-statistic), in terms of their sensitivity, specificity and positive predictive value, and for calibration to assess performance across levels of predicted risk.

**Results:** Among the 3 726 380 adult residents of Emilia-Romagna at the end of 2011, 449 163 (12.1%) were hospitalised in 2012, 4.2% were hospitalised for the selected conditions or died in 2012 (3.6% hospitalised, 1.2% died). The C-statistic for predicting 2012 outcomes was 0.856. The model was well calibrated across categories of predicted risk. For those patients in the highest predicted risk decile group, the average predicted risk was 23.9% and the actual prevalence of hospitalisation or death was 24.2%.

**Conclusions:** We have developed a population-based model using a longitudinal administrative database that identifies the risk of hospitalisation for residents of the Emilia-Romagna region with a level of performance as high as, or higher than, similar models. The results of this model, along with profiles of patients identified as high risk are being provided to the physicians and other healthcare professionals associated with the Patient-Centered Medical Homes to aid in planning for care management and interventions that may reduce their patients' likelihood of a preventable, high-cost hospitalisation.

### Strengths and limitations of this study

- This study included the entire adult population of the Emilia-Romagna Region of Italy, over 3.7 million people.
- The study used an existing longitudinal administrative healthcare database with both the advantage of much lower cost than new data collection and the disadvantage of potential errors in administrative data.
- The results of the study are being used to assist in the development of newly formed Patient-Centered Medical Homes.

patients' problems, is shifting to a more proactive model designed to take the initiative in providing care for an increasingly older population that has a greater prevalence of chronic conditions, often with multiple medical and social needs. These changes are driving the reorganisation of the primary care system, emphasising coordination and cooperation among healthcare professionals.<sup>1–6</sup> Among the approaches to addressing this need has been the establishment of Patient-Centered Medical Homes, organisations to which teams of healthcare providers are engaged in delivering comprehensive, coordinated, patient-centred care to patient-defined populations.

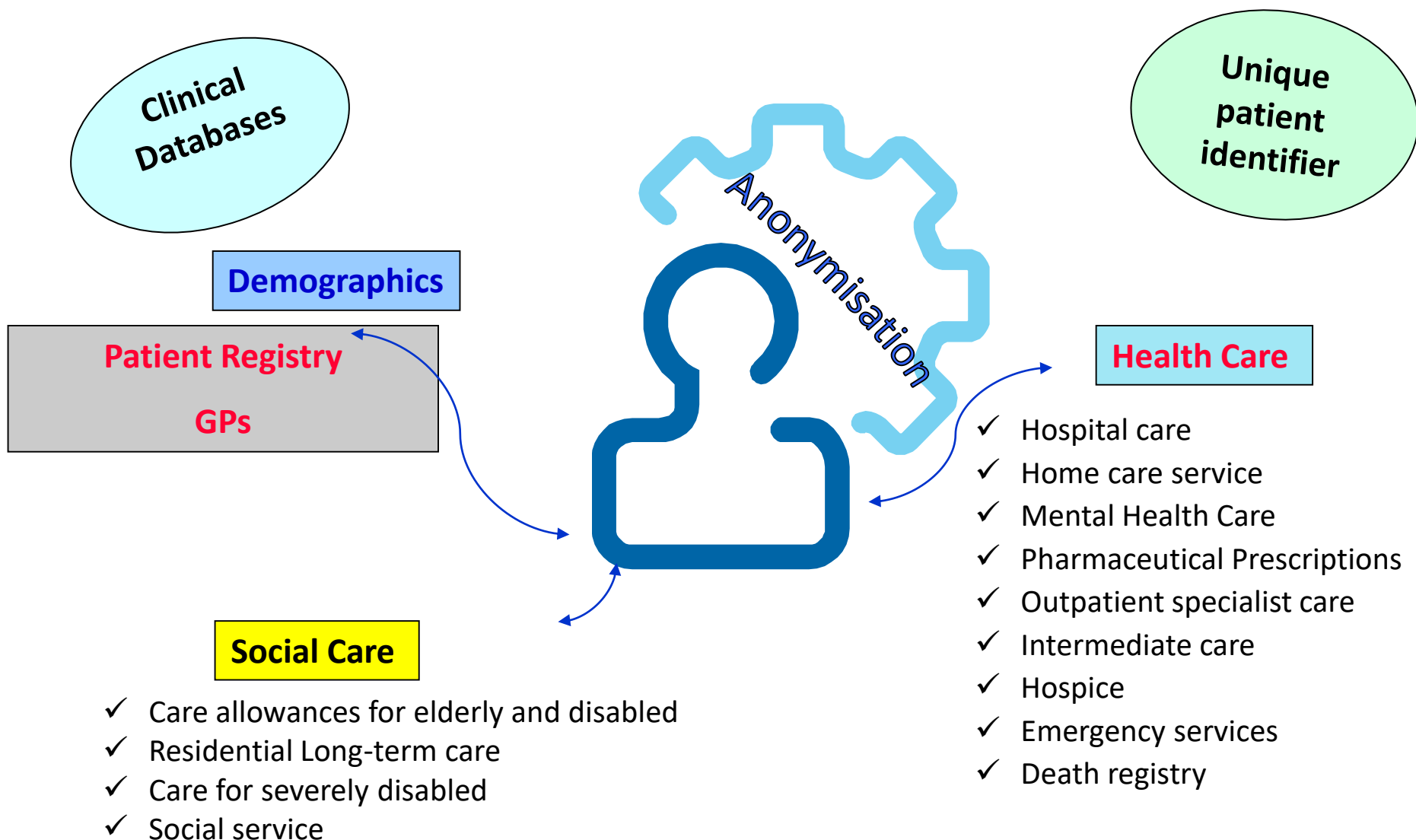
Primary care has a central role in the Italian National Health Service (NHS). Twenty-one regional governments are responsible for ensuring the delivery of a health benefits package through a network of geographically defined, population-based Local Health Authorities. Primary care physicians work for these authorities as independent contractors and act as 'gatekeepers' for specialty and other referral services for their patients.<sup>7</sup>

With the belief that a strong primary care system is conducive to innovative innovation



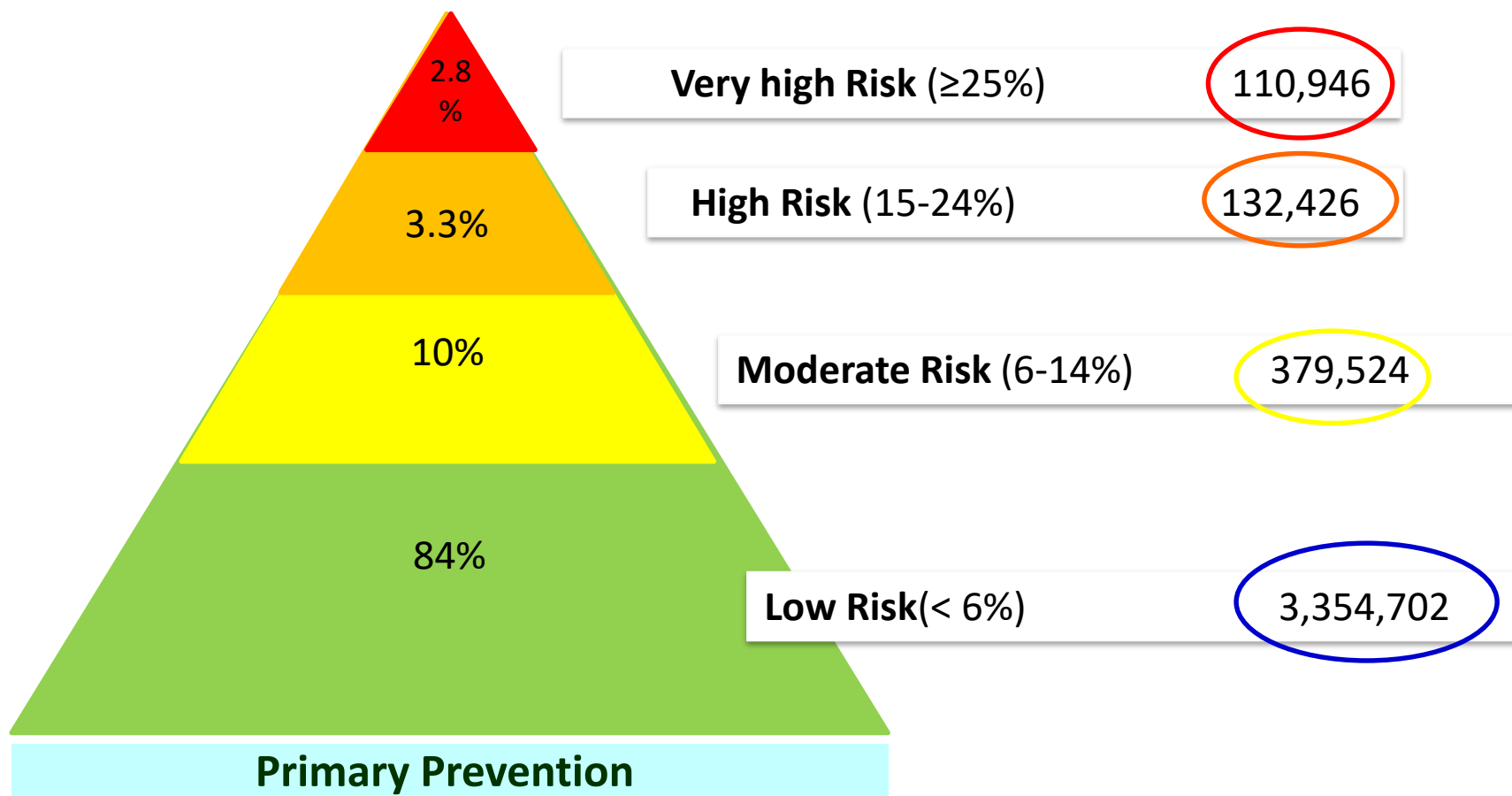


# Emilia-Romagna clinical-administrative database





# Risk Score - 2015



**Population  $\geq 18$  y.o. - N= 3,977,598**

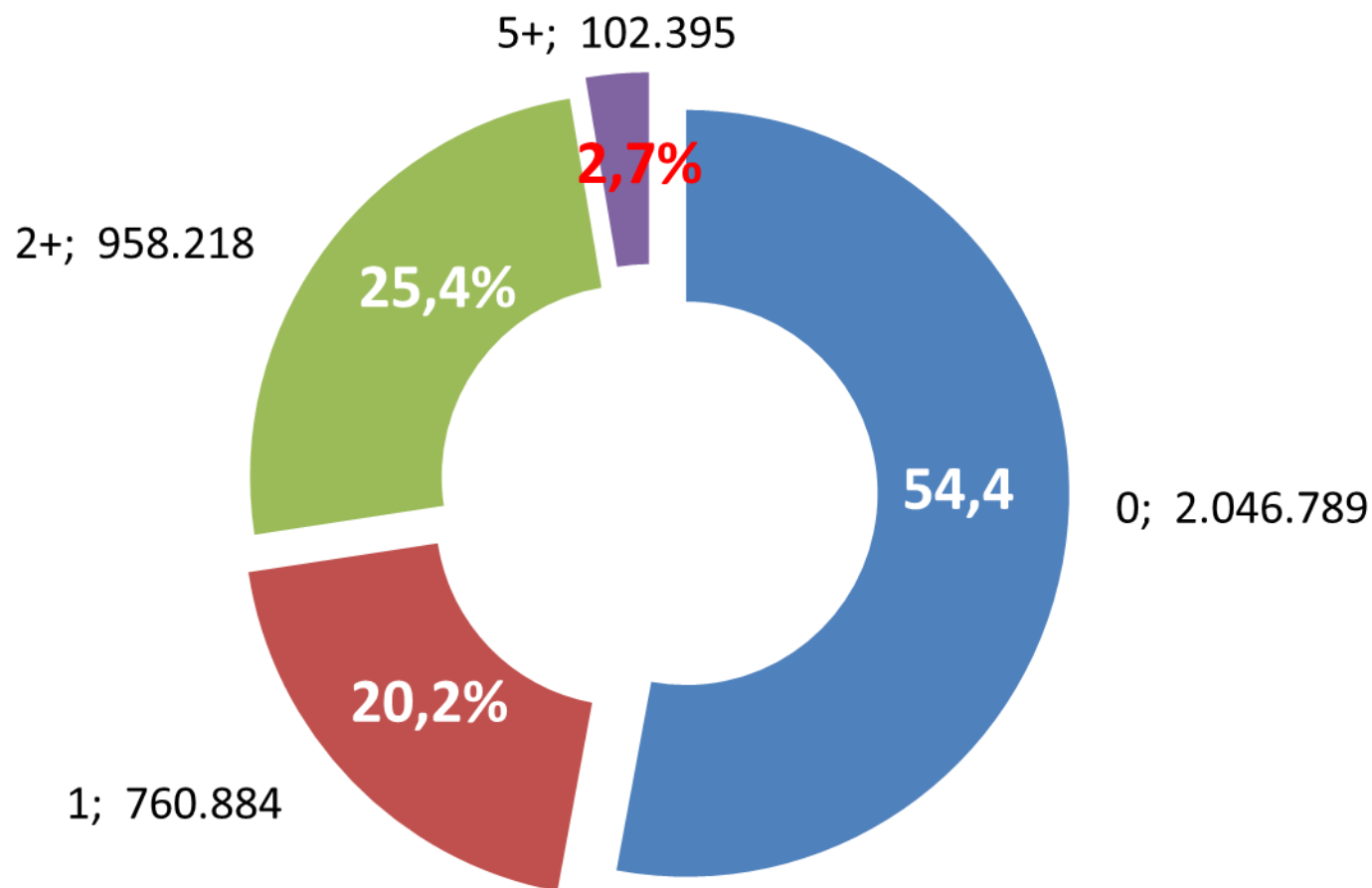




ANNO 2015	Very high risk N= 110,946		High risk N=132,426	
	N	%	N	%
Sex				
Males	50,880	45.9	59,546	45.0
Females	60,066	54.1	72,880	55.0
Age				
14-24	38	0.0	142	0.1
25-34	133	0.1	286	0.2
35-44	647	0.6	710	0.5
45-54	1,961	1.8	2,146	1.6
55-64	4,152	3.7	4,206	3.2
65-74	10,118	9.1	11,403	8.6
75-84	29,631	26.7	41,460	31.3
85+	64,266	57.9	72,073	54.4



# 2,7% patients with 5+ diseases





**Paziente: 1094553 Patient**

**Sesso: F Età: 44**

## Profiles of Risk

**Rischio di ospedalizzazione previsto per il 2013:**

**Molto alto**

**Il grafico mostra il cambiamento nel tempo del rischio di ospedalizzazione previsto per il paziente**



Questo documento è un sommario delle informazioni di natura amministrativa per un paziente previsto a probabile 'rischio molto alto' di ospedalizzazione nel 2013 in base ai consumi sanitari del 2012.

### Patologie croniche (in base al sistema o eziologia)

- |   |  |  |
|---|--|--|
| <input checked="" type="checkbox"/> Cardiovascolari   | <input type="checkbox"/> Genitourinarie          | <input type="checkbox"/> Oftalmologiche            |
| <input type="checkbox"/> Dermatologiche               | <input type="checkbox"/> Ginecologiche           | <input type="checkbox"/> Otorinolaringoiatriche    |
| <input type="checkbox"/> Ematologiche                 | <input type="checkbox"/> Immunologiche           | <input checked="" type="checkbox"/> Psichiatriche  |
| <input type="checkbox"/> Endocrine                    | <input type="checkbox"/> Infettive               | <input type="checkbox"/> Respiratorie              |
| <input checked="" type="checkbox"/> Epatiche          | <input type="checkbox"/> Muscoloscheletriche     | <input type="checkbox"/> Sistema Genitale Maschile |
| <input checked="" type="checkbox"/> Gastrointestinali | <input checked="" type="checkbox"/> Neurologiche | <input type="checkbox"/> Tumoriali                 |

### Ospedalizzazione 2012 – N. di ricoveri occorsi al paziente: 1

#### **N. 1 Degenza ordinaria presso Ospedali Riuniti-Pr**

**02/01/12 - 02/02/12 gg\_deg: 31 Dimissione: Ordinaria a domicilio**  
**Patologia principale del ricovero:** 785.59 Altro Shock Senza Menzione Di Trauma  
**Comorbidità:** 789.5 Ascite  
 571.2 Cirrosi Epatica Alcolica  
 570 Necrosi Acuta E Subacuta Del Fegato  
 307.1 Anoressia Nervosa  
 070.54 Epatite C Cronica Senza Menzione Di Coma Epatico  
**Procedura:** 42.91 Legatura Di Varici Esofagee

### Pronto Soccorso 2012 – N. : 3

**Presso Ospedali Riuniti-Pr**

**13/02/12 - 13/02/12**

**Altri Sintomi O Disturbi**



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Visite specialistiche

Dermatologia

Gastroenterologia

Malattie Infettive E Tropicali

Odontoiatria E Stomatol.

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Farmaci: N. totale di farmaci nel 2012: 11

**A02 Farmaci Per Disturbi Correlati All'Acidita'**

Lansoprazolo

1	2	3	4
---	---	---	---

**A06 Lassativi**

Lattitolo

1	2	3	4
---	---	---	---

Lattulosio

1			
---	--	--	--

**A07 Antidiarroici, Antinfiammatori Ed Antimicrobici Intestinali**

Rifaximina

1	2	3	4
---	---	---	---

**B02 Antiemorragici**

Fitomenadione

1	2	3	4
---	---	---	---

**C03 Diuretici**

Torasemide

1	2	3	4
---	---	---	---

Canrenoato Di Potassio

1	2	3	4
---	---	---	---

Furosemide

1			
---	--	--	--

**C07 Betabloccanti**

Carvedilolo

1	2	3	4
---	---	---	---

**J01 Antibatterici Per Uso Sistemico**

Ciprofloxacina

			4
--	--	--	---

**N03 Antiepilettici**

Fenobarbital

1	2	3	4
---	---	---	---

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Il paziente è stato esposto a politerapia nel 2012, definita come l'uso simultaneo di 5 o più principi attivi per almeno 15 giorni consecutivi.

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- ✓ Risk Profiles provided to GPs
- ✓ Activation of Professional Teams
  - ✓ GPs, specialists, nurses, physiotherapists, social workers
  - ✓ a proactive response...
- ✓ Interdisciplinary Paths
  - ✓ prevention, clinical appropriateness and adherence, health education...
- ✓ Participation of Community,
  - ✓ Patients, Caregivers, Associations





# Evaluation of disease management programs in the profile risk test sites

## Patient Assessment Chronic Illness Care-PACIC



**Patients point-of-view** in cooperation with patients' associations (CHF, diabetes, COPD, ESRD)

## Assessment Chronic Illness Care- ACIC

**Health care team point-of-view** focus-group:

GPs, nurses, social workers, ambulatory specialists, Primary Care Department)





# Open data

**E-R Salute**  
Sistema Informativo Politiche per la Salute e Politiche Sociali

... ? stats viewer indicatori search

E-R | Salute > SISEPS > ReportER > PRIM

**PRIM - Demografia ed Epidemiologia**

Composizione NCP **Trattamento malattie croniche** Multimorbidità

**Selezioni**

Anno *i* Tutti 2015 2014 2013 2012

Condizioni croniche *i* Asma BPCO Cardiopatia ischemica Condizioni reumatologiche Diabete mellito

**Prevalenza di trattamento delle malattie croniche**

Prevalenza del trattamento di specifiche condizioni croniche stimata utilizzando i dati sul consumo di prestazioni sanitarie e sulle esenzioni per patologia.

[Dettaglio Scheda](#)

Tabella Mappa Grafico

Asthma, COPD, Rheumatology, Diabetes, ESRD, Hyperlipidemia, Iperplasia prostatica, Hypertension, Parkinson, CHF

<http://salute.regione.emilia-romagna.it/siseeps/sanita/prim/analisi-statistica/reportistica-predefinita-nuclei-cure-primarie>



<http://salute.regione.emilia-romagna.it/documentazione/multimedia/video/the-one-stop-home-for-healthcare>





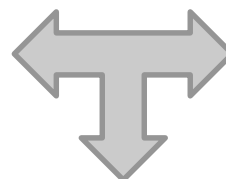


# Casa della Salute Bomporto (MO)

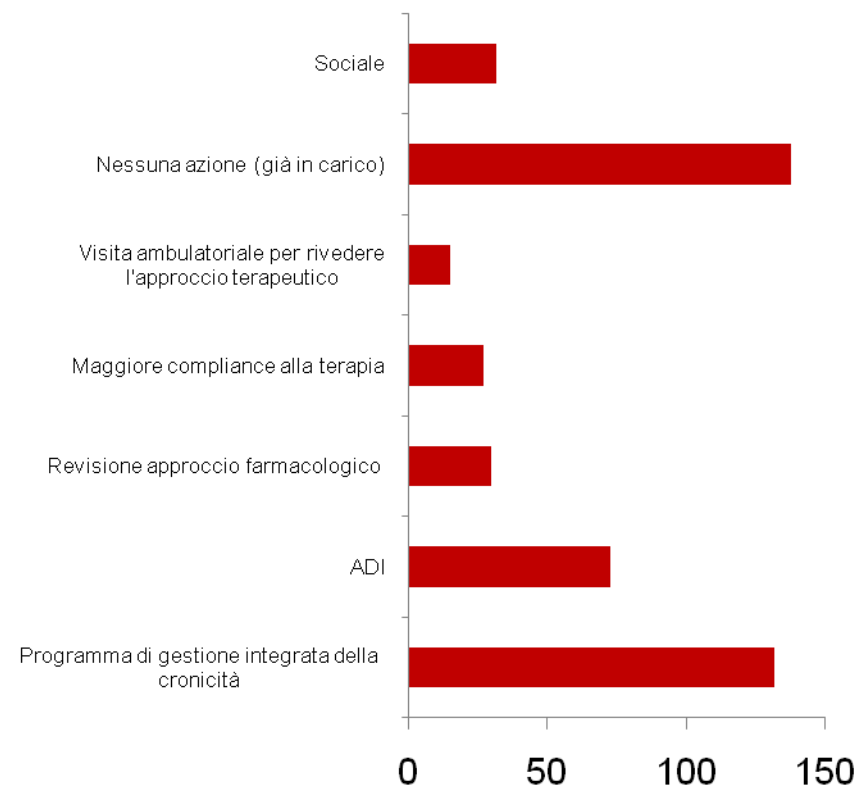
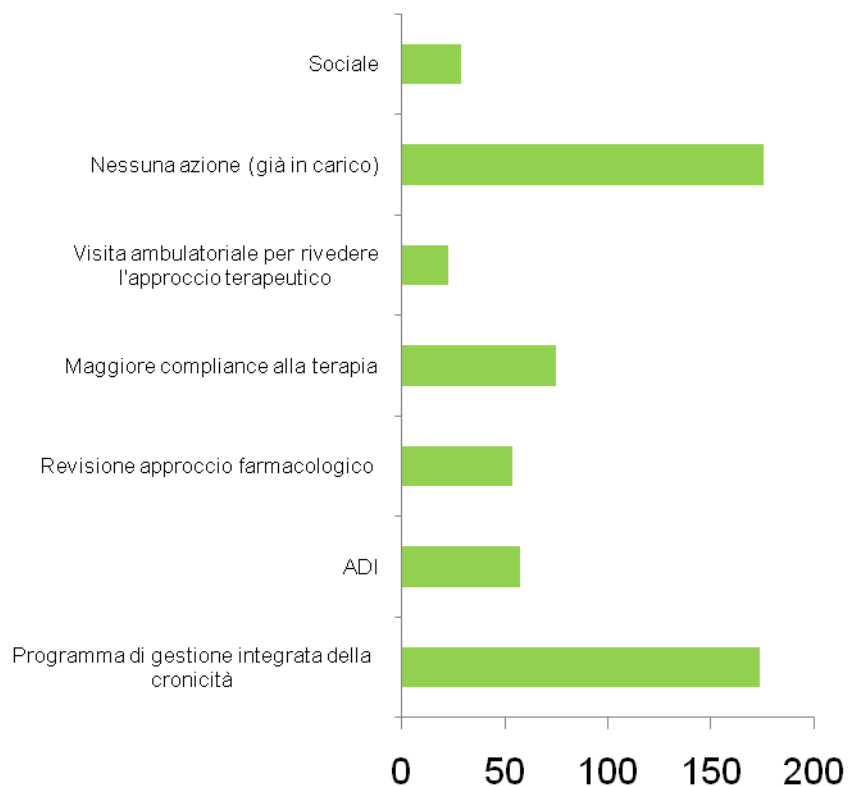
27.305 assistiti

23 MMG

598 High Risk



447 Very high Risk

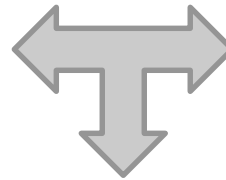


# Interventi nella Casa della Salute Forlimpopoli (FC)

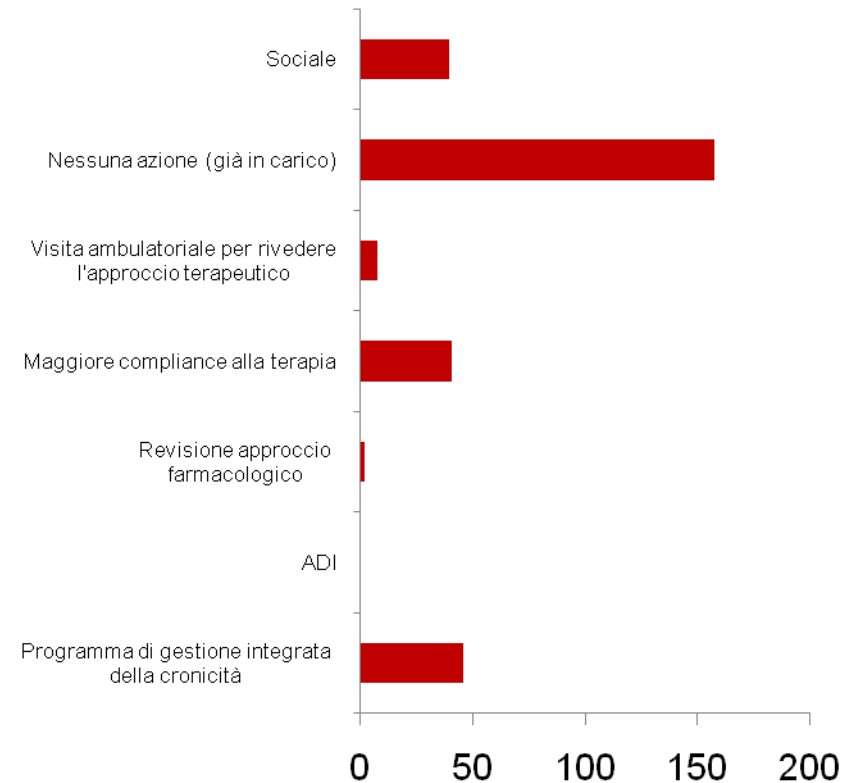
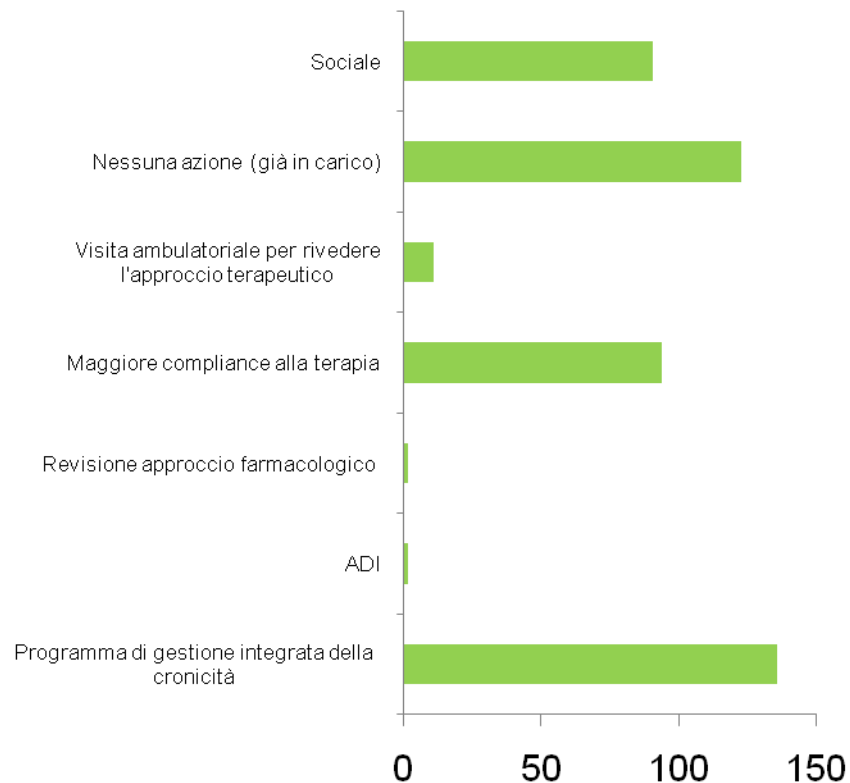
18.858 assistiti

15 MMG

459 pazienti a rischio alto



295 pazienti a rischio molto alto



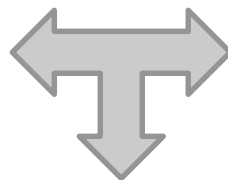


# Interventi nella Casa della Salute Russi (RA)

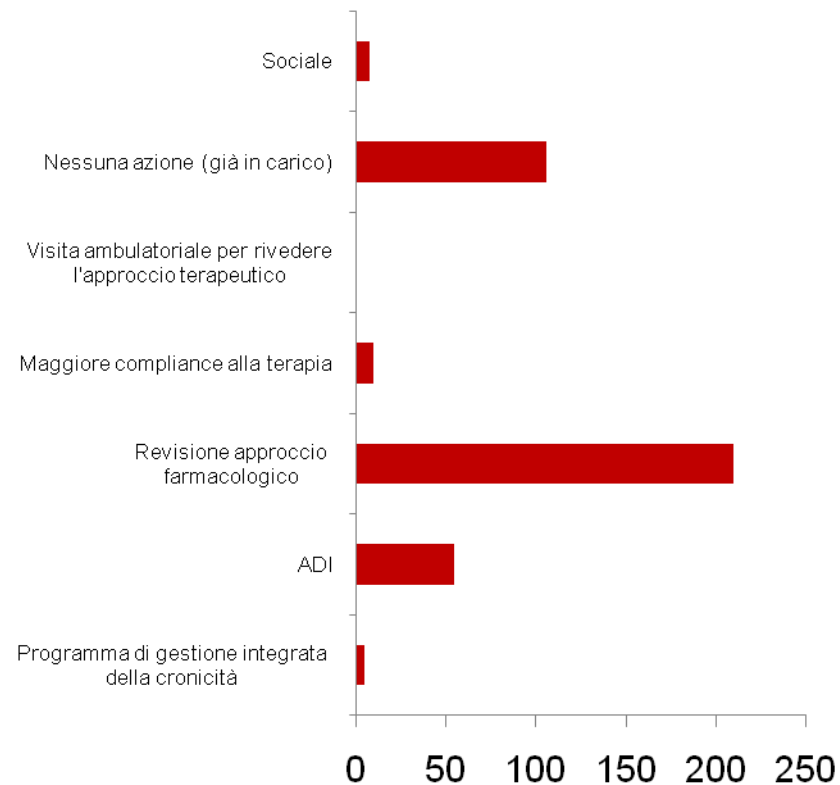
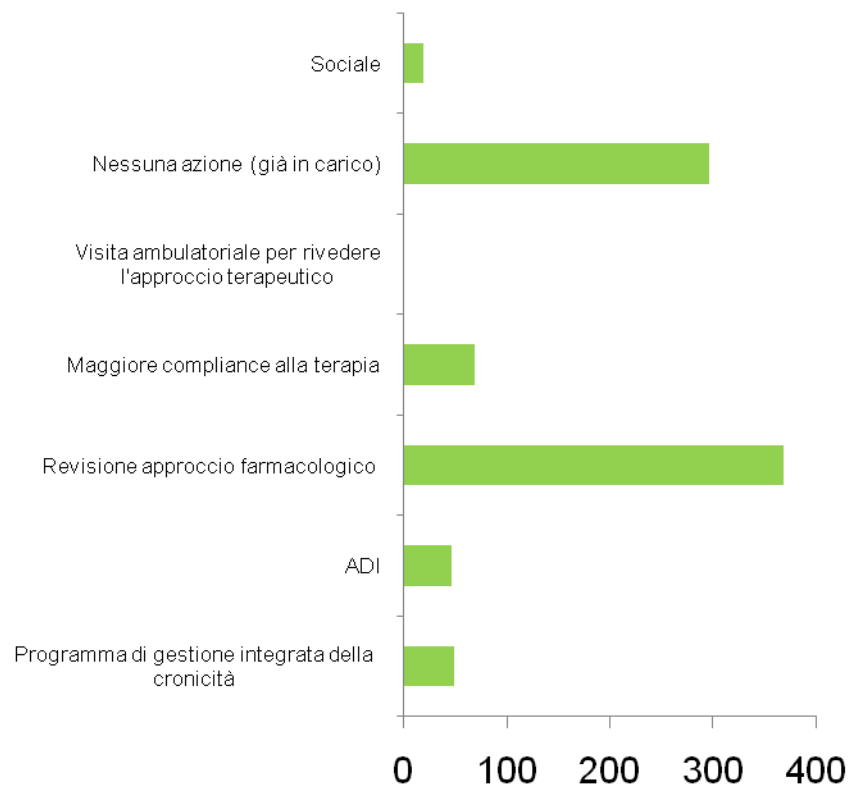
16.510 assistiti

10 MMG

456 pazienti a rischio alto



316 pazienti a rischio molto alto



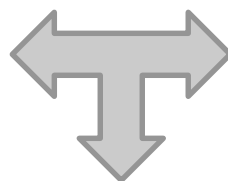


# Interventi nella Casa della Salute San Secondo (PR)

15.000 assistiti

8 MMG

525 pazienti a rischio alto



357 pazienti a rischio molto alto

