A regional model to predict, identify and manage multimorbidity and frailty

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Primary care in Emilia-Romagna......
## A few figures (2017*)

<table>
<thead>
<tr>
<th></th>
<th>Emilia-Romagna</th>
<th>Italy</th>
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</thead>
<tbody>
<tr>
<td>Residents (x 1,000)</td>
<td>4,457</td>
<td>60,589</td>
</tr>
<tr>
<td>% &gt; 65 yrs</td>
<td>23.7</td>
<td>22.2</td>
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<tr>
<td>GDP (000’s €), per capita</td>
<td>33.6</td>
<td>27.1</td>
</tr>
<tr>
<td>Infant mortality ‰</td>
<td>2.37</td>
<td>2.90</td>
</tr>
<tr>
<td>Public health expenditure (€), per capita</td>
<td>1,890</td>
<td>1,846</td>
</tr>
<tr>
<td>Hospital beds ‰ residents</td>
<td>3.9</td>
<td>3.2</td>
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</tbody>
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*Source: Health for all Italy (2017)*  
* Or nearest year
The Regional Health Service

- 8 Local Health Units
  - 38 Health Districts
  - 53 Hospitals

- 5 Hospital Trusts (4 Teaching)

- 4 Research Hospitals

18 Community Hospitals

102 Community Health Centres

2.993 GPs
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
102 Community Health Centers
(Casa della Salute)
2 million residents
Innovation...
Emilia-Romagna clinical-administrative database

Clinical Databases

Demographics

Patient Registry

GPs

Social Care

- Care allowances for elderly and disabled
- Residential Long-term care
- Care for severely disabled
- Social service

Unique patient identifier

Health Care

- Hospital care
- Home care service
- Mental Health Care
- Pharmaceutical Prescriptions
- Outpatient specialist care
- Intermediate care
- Hospice
- Emergency services
- Death registry

Anonymisation
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 general practitioners (GPs) and nurses in the Case della Salute (Community Health Centers)

• 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 for ACSC or death

- adult population of the Region

- use of regional health/administrative data

- Risk Score calculation

- high level of statistic accuracy (C= 0.85)
Independent variables

✓ Demographic data
  ✓ Age
  ✓ Sex
  ✓ Living conditions (town, hills, mountains)

✓ Morbility and severity indicators

✓ Health care quality indicators
  ✓ Polypharmacy
  ✓ DDI (drug-to-drug interaction)
  ✓ Potentially inappropriate drug prescription
  ✓ Appropriate management of chronic conditions

✓ Health care consumption indicators as a proxy of severity: hospitalisation, ER visits, outpatient care...
Population risk stratification - 2016

- **Very high risk (≥25%)**: 100,470
- **High risk (15-24%)**: 124,589
- **Moderate risk (6-14%)**: 354,083
- **Low risk (< 6%)**: 3,163,348

Population 18+ = 3,765,891
Concentration of expenditure: 1% patients...13 % expenditure
84% of the residents are low risk...
3.3% are very high risk
Testing the tool

Community Health Centres

- GPs
- Hospital specialists
- Nurses
- Social workers
- FKT
- Voluntary sector
✓ 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

✓ Participation of Community,
  ✓ Patients, Caregivers, Associations

✓ Telemedicine tools
Community Health Centre
Operations center – Chronic disease unit

Telemedicine tools

Patient:
Patient monitoring using mHealth system

Hospital/Outpatient specialist:
Data visualisation and analysis for medical records update and consulting
In practice... activation in 6 CHC

3.453 high risk patients

2.568 very high risk patient

Social care
No action (patient already known)
Medical encounter to discuss therapy
Compliance improvement programs
Drug therapy review
Home care activation
Chronic care management programs

Social care
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Evaluation of disease management programs in the RHO 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)
Patient Assessment Chronic Illness Care - PACIC – 202 patients

Participation in the definition of care pathways

- Interaction: 55.8%
- Follow-up: 55.6%
- Counselling: 69.1%
- Sustainability: 81.4%
- Identification of clinical tasks: 66.9%
Ministry of Health grant (CCM)

• Economic evaluation of risk stratification
• Impact of risk stratification on outcome indicators
• Analysis of motivational tools (counselling, conversation maps, Barrows Cards,...)
• Impact on professional integration (PACIC, ACIC)
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