

# Identikit of the Person Seeking Care at Public Hospital in Italy in the European Health Context: A Collaborative Study

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## ABSTRACT

**Background:** The number of frail patients for whom the care of a single acute episode necessarily requires both a global approach and a close interaction with the local health services and social services is progressively growing. The issue of managing frail and complex patients at hospitals still needs to be resolved. Currently, care is fragmented in multiple specialized interventions and patients often find themselves moved from one ward to another, resulting in a perilous loss of information and continuity. The purpose of this paper is to analyze hospitalization modalities, the impact of internal medicine (IM) on the hospital activities, the relationship with emergency room (ER) and general patient characteristics, in order to explore putting the current discussion on the new role of IM in the future hospital into practice. **Materials and Methods:** In November 2014, a collaborative study assessed the the role of hospital internal medicine departments in relation to overall clinical activity in Italian hospitals nationwide by processing data of hospital derived from discharge records (SDO) provided by the Ministry of Health. All the 2013 SDO were analyzed. **Results:** About 55% of Italian hospital admissions come from the ER. IM seems to have the most important role in the management of emergency hospitalizations, covering 27% of admissions from ER. The identikit of the person seeking care at public hospital is as follow: (1) older age, (2) low level of education, (3) active comorbidities (from 3 to 4), (4) urgently admitted due to exacerbation of one or more of the diseases which the patient is already suffering, (5) mainly admitted to the IM department (medical area 42%), and (6) requires continuous monitoring and advanced technology. **Conclusions:** The Internal Medicine Department is positioned to play a central role in overall patient management in the Future Hospital.

**Key words:** Future hospital, hospital admissions, hospital discharge records, internal medicine role, polypathological patients

## BACKGROUND

According to the World Health Organization (WHO), the four major noncommunicable diseases (NCDs) (cardiovascular diseases, cancer, chronic obstructive pulmonary disease, and diabetes) account for nearly 86% of all deaths and 77% of the European disease burden. In Europe loss of economic productivity as a result of NCDs is significant: for every 10% increase in NCD mortality, economic growth is reduced by 0.5%.<sup>[1,2]</sup> The number of frail patients for whom the care of a single pathological episode

necessarily requires both a global approach and a close connection with the local health services and social services is progressively growing. The issue of managing frail and complex patients at hospitals still needs to be resolved. Nowadays, their care is fragmented in multiple specialized interventions and patients often find themselves moved from one ward to another, resulting in a dangerous loss of information and continuity. As opposed to what we imagine and is shown by scientific studies,<sup>[3]</sup> the hospital internist faces especially difficult diagnoses and problems of instability in the context of complex and seriously ill polypathological patients that, once stabilized, are transferred to areas of lower

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intensity care. The management of acute, clinically unstable, complex diseases working through diagnostic challenges are the bread and butter of the internist's job which often goes beyond the scope of other specialists' clinical activity. In contrast, the management of complexity, comorbidity, frailty, disability, and social problems is also shared with other specialists (geriatricians, physiatrists...) and settings.<sup>[4,5]</sup>

In Italy, the number of Internists has grown by 10% since 1990 reaching 11,435 units. They manage 39,000 beds handling >1 million admissions in 1060 hospital internal medicine (IM) wards.<sup>[6]</sup> The internist is expected to ensure cost-effective management of complex patient, reducing the fragmented management of several specialists that can result in significant growth in health-care costs through the increased use of technology and subsequent referrals to super-specialists.<sup>[7]</sup> With the changed Italian epidemiological scenario and the increased life expectancy, the internist role appears particularly crucial in response to the growing pressure on the emergency department due to overcrowding. The purpose of this paper is to analyze the modalities of hospitalization, the impact of IM on the hospital activities, the relationship with emergency room and general patient characteristics in order to implement the current discussion on the new role of IM in the future hospital.<sup>[8]</sup>

### Impact of IM in hospital activities

In November 2014, a collaborative study assessed the role of internal medicine departments in relation to overall clinical activity in Italian hospitals nationwide by processing data derived from discharge records (SDO) provided by the Ministry of Health. All the SDO from 2013 were analyzed. The analysis is intended solely for the hospitals' acute admissions in the ordinary regime, excluding both admissions for vaginal delivery and cesarean. To date, preliminary data analysis is

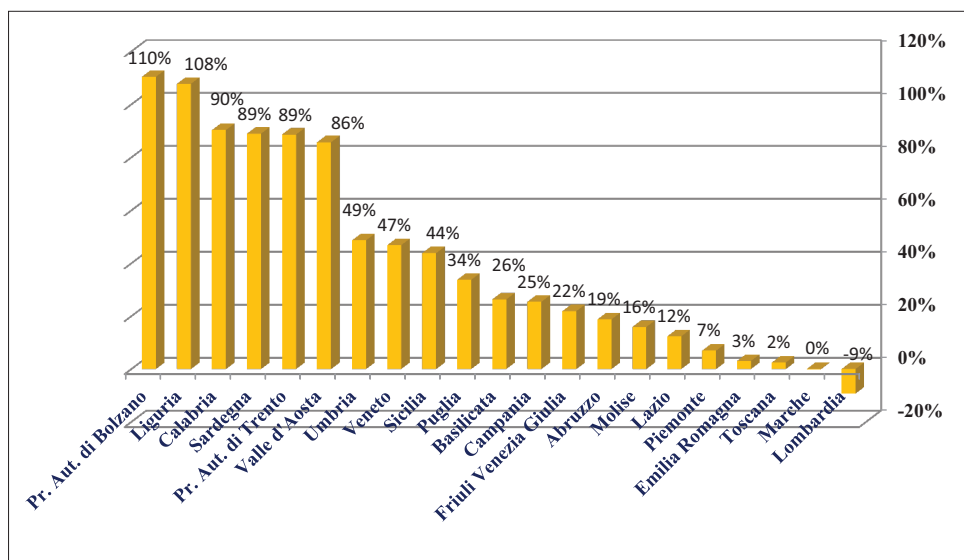
available describing the role of IM in the management of chronic diseases both at hospital and at community level and the relationship with primary care facilities. Preliminary data has revealed that 55% of Italian hospital admissions come from the Emergency Room. Figure 1 shows the regional differences between urgent and planned admission rates. Total general acute hospital admission (not considering access through Day Hospital) in 2013 were 6,635,112, a falling by 4% compared to 2012 and following a general trend evident since 2001.<sup>[9]</sup>

The DRGs emanated from medical wards are 3,846,601 of which the discharged from the IM are 1,073,525. The male/female ratio is 49/51%. Of the total number of discharged patients, 16.18% came from Internal Medicine Units. The IM is responsible for 28% of all patients discharged from medical wards.

The top 10 DRG were reimbursed at rates of between 1600€ and 5492€, and an average weight between 0.7 and 1.62. The most and second-most DRGs are heart failure and pulmonary edema. The top 10 DRGs represented 5% of the total value of admissions, of which Internal Medicine DRGs contributed 13.92%, which supports the hypothesis that IM patients are more complex and carry more weight in terms of reimbursement. Of the top 10 DRGs: 6% were transferred to step-down care, 75% were discharged home and registered deaths amounted to 14%. The national average length of stay in IM in 2013 was 9.28 (7–13 days). Table 1 is a synoptic table of the main characteristics of the top 10 DRGs in Italian IM.

### IM has a central role in the management of urgent hospital admissions

The top eight wards receiving most of the patients from urgent admission are the following in descending order:



**Figure 1:** Differences of urgent admission rates compared to planned ones in Italian regions  
 Font: 2013 SDO data processing by CREA Sanità

**Table 1: Top 10 DRGs present in internal medicine departments in Italy (Font: Ministry of Health, 2013)**

Casuistry of internal medicine admissions (Code 26)		Ministry of Health 2013 SDO		National total admissions		663.5112		16.18%	
DRG	Description	Cases	Days	Mean length of stay	Cost	Value (€)	DRG weight		
		1.073.526	9.960.799	9,28	3.336,20	3.426.285.053,85			
	FIRST10	416.986	4.050.969	9,71					
1.	127	107.280	1.010.181	9,42	3.052,24	327.444.527,78	1,0270		
2.	87	69.699	672.287	9,65	3.801,92	264.990.091,83	1,2243		
3.	89	46.463	514.533	11,07	3.557,54	165.294.056,80	1,1394		
4.	576	32.774	415.184	12,67	5.492,83	180.021.998,81	1,6432		
5.	14	30.619	307.224	10,03	3.890,66	119.128.166,91	1,2605		
6.	88	30.331	260.751	8,60	1.600,34	48.539.957,12	0,8209		
7.	395	27.520	238.394	8,66	1.675,70	46.115.233,36	0,8552		
8.	316	26.807	256.848	9,58	3.734,46	100.109.791,50	1,1501		
9.	524	25.722	180.647	7,02	2.543,05	65.412.329,52	0,7692		
10.	202	19.771	194.920	9,86	4.013,21	79.345.200,28	1,2862		

IM (general medicine), general surgery, orthopedics, cardiology, pediatrics, obstetrics and gynecology, neurology and geriatrics. IM seems to play the most important role in the management of emergency hospitalizations, covering 27% of admissions from ER. Other departments also have important roles: general surgery manages 10% of emergency hospitalizations, orthopedics and cardiology both manage 8%. About 7% of emergency patients are treated by pediatrics and 6% by the obstetrics and gynecology wards. Although increasing, neurology and geriatrics receive less patients coming from ER (4% and 3%, respectively). About 27% of admissions are in minor specialties [Figure 2]. The impact of the IM on the management of urgent admissions can be partly explained by the fact that the IM is present in all hospitals with a high number of beds, while the specialized wards (geriatrics, neurology, pediatrics, etc.) are less well represented and have a lower number of beds. According to the literature,<sup>[10,11]</sup> Internal Medicine wards mainly admit complex cardiac, neurological and geriatric DRGs. Older age, together with polypharmacy, absence of formal and/or informal home help services, history of falls, temporal disorientation, place of living, and use of psychoactive drugs contribute significantly to determine the hospital admission through ER.

Table 2 is a synopsis of the different national and regional performance indicators analyzed in the article and Figure 3 shows examples of the IM performances of regions representing different Italian healthcare scenarios.

### Relationship between available primary health care/community facilities and emergency admission demand

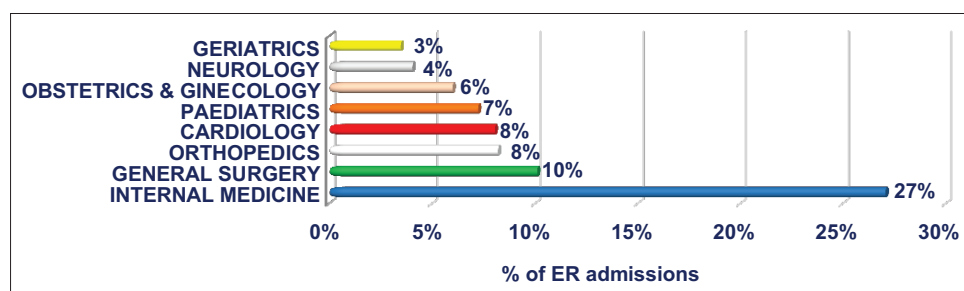
Examining the percentage of admissions in IM coming from the ER allows us to deduce the role of the “non hospital” facilities in determining the demand for emergency admissions. The data analyzed clearly demonstrates that the duration of length of hospital stay decreases in regions with efficient/well organized primary care facilities [Figure 3].

Notably, the percentage of emergency hospitalizations admitted to internal medicine departments is unexpectedly high in Italian regions in which the community-based healthcare system is better able to efficiently respond to the needs of the population,

and in which primary care is organized to provide appropriate management of chronic disease during phases of stability. Indeed in Emilia Romagna 86% of admissions to Internal Medicine came from the ER and had an average stay of 8.74 days less than the average Italian length of stay (LOS). The average LOS increases with increasing age of patients, with inpatient admissions reaching 10.18 days for those over 85 years. These findings suggest that step-down facilities enable hospital patients to be discharged more quickly and effectively, but do not impact significantly on the percentage of patients urgently admitted to Internal Medicine wards.

Similarly in Tuscany, also considered a “virtuous” region, 90% of Internal Medicine admissions originate from the ER with a mean length of stay of 8.26 days, again below the national average. There seems to be little correlation between efficiency of primary care facilities and admissions to Medicine: perhaps the patients are hospitalized more appropriately, exclusively selecting for “real” emergencies, however still representing an irreducible percentage of admissions. Lazio, a region adherent to the the national reimbursement plan, presents poorly organized “non hospital” facilities that are unable to meet citizens health needs. In addition, due to the budget deficit, choices in health-care management are limited. The average LOS in Internal Medicine of 9.74 days, above the national average, is testimony to the manifest under-performance of this regional health system. Unexpectedly, despite the reduced performance, the urgent admissions are only 78% of the total admissions. This is difficult to explain when comparing these figures with those of other Italian regions with better health performance. The Lazio region scenario confirms that the average LOS mirrors the increasing age of patients, with an average of 7.43 days for patients between 15 and 39 years of age and an increase to 11 days for those between 75 and 84.

However, the percentage of urgent admissions seems to be unaffected by these services due to the number of patients requiring admissions for acute or complex conditions. This is driven primarily by complex elderly patients during exacerbation of diseases that cannot be treated in primary care structures, but require hospitalization with advanced technological capability and intensive care.



**Figure 2:** Distribution of emergency admissions according to discharge specialties  
Font: 2013 SDO data processing by CREA Sanità mod. 2019

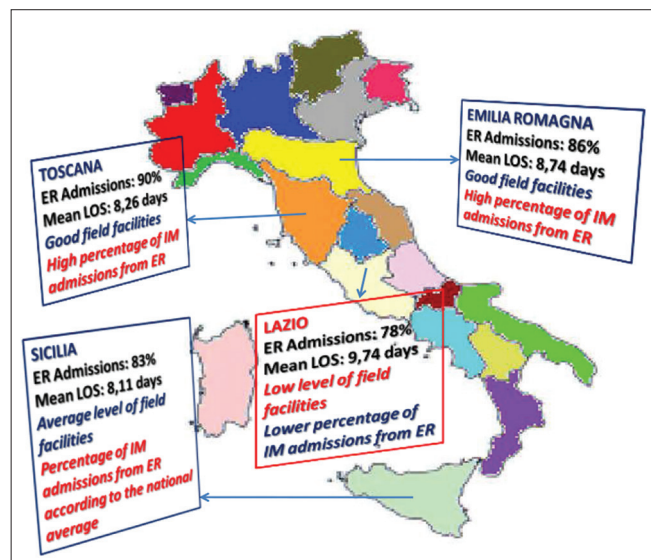
**Table 2: Comparison between national and regional performance indicators: synoptic table**

Area	Regions	Performance indicators				Demand <sup>[12-15]</sup>		
		Emergency admissions (age standardized rates)	Planned admissions (age standardized rates)	Emergency admissions length of stay	Emergency admissions value	Average age of emergency admissions	Demographic (mortality rate and % of ≥60 years)	Health needs (drug consumption, % disabled people >6 years, % mortality for NCDs)
<i>Italy</i>		56/1000 inhabitants	46/1000 inhabitants	8,43 days	3,682,19 €	Emergency 59,8 years	Mortality rate: 10.01/1000 inhabitants Population >60 years: 27%	Average annual cost of drugs pro capita: 438€ % disabled people >6 years: 4.85% Mortality for NCDs: 92%
North	Aosta Valley	74	40	9,23	3,603,56	60	+	-
	Piedmont	47	44	9,89	4,198,44	62	++	-
	Lombardy	52	58	9,16	3,744,30	58	=	-
	Provincia Autonoma Bolzano	86	41	7,40	3,172,81	60	+	-
	Provincia Autonoma Trento	59	31	9,14	3,735,31	61	+	-
	Veneto	51	34	9,83	3,699,71	63	+	-
	Friuli Venezia Giulia	57	46	9,33	3,764,86	65	++	=
	Liguria	62	30	9,03	3,888,23	64	+++	++
	Emilia Romagna	58	50	8,03	3,660,95	64	+	=
Center	Tuscany	50	49	8,02	4,081,34	65	+	+
	Umbria	69	46	7,64	3,477,82	62	+	++
	Marche	48	48	9,29	3,871,98	63	+	=
	Lazio	56	50	8,80	3,727,46	58	-	++
	Abruzzo	56	47	8,37	3,560,31	59	+	=
	Molise	64	55	8,04	3,341,64	58	+	=
	Campania	57	46	6,91	3,363,23	53	-	-
South	Puglia	65	49	7,52	3,366,24	55	-	=
	Basilicata	50	40	8,22	3,689,61	61	-	+
	Calabria	51	27	7,48	3,368,97	56	-	=
	Sicily	56	39	7,71	3,768,92	54	-	++
	Sardinia	69	37	7,50	3,262,18	58	-	=

+ and - indicates the grading of deviation from the national average; = means the same value of the national average. NCD: Noncommunicable diseases

**Table 3:** Identikit of the person seeking care at public hospital in Italy (Font 2013 SDO, Italian Ministry of Health)

Items	All departments (%)	Internal medicine unit
1. Older age (over 65 years)	79	60%
2. Low level of education (percentage with certificate of primary education)	51	60%
3. Active comorbidities	N.A.	From 3 to 4
4. Emergency admissions	55	27% of the 55%
5. Admitted to a medical area	42	N.A.
6. Needing continuous monitoring and advanced technology	N.A.	20–25%



**Figure 3:** Internal medicine admissions: examples of regional health system performances. IM: Internal medicine, ER: Emergency Room, LOS: Length of stay

### Identikit of the person seeking care at public hospital in Italy

The identikit of the person seeking care at public hospital is as follow: (1) Older age (over 65 are 79%, 60% in IM), (2) low level of education (primary school 51%, 60% in IM), (3) active comorbidities (from 3 to 4), (4) emergency admission 55% of hospital admissions, 27% admitted in IM due to exacerbation of one or more of the diseases which the patient is suffering, (5) mainly admitted in IM department (medical area 42% of the emergency admissions), and (6) needing continuous monitoring and advanced technology (Table 3).

## DISCUSSION

The educational level factor can explain the preferential use of the emergency department for inadequate management of the diseases the patient is suffering from. In fact, both the level of education and age are constituent elements of the human development index (ISU), a synthetic measure that assess long-term progress in three fundamental dimensions of human development: Life expectancy, the years of school

attendance and per capita income in dollars, at the constant rate of 2005, converted using purchasing power parity. According to the 2013 UN Human Development Report, Italy is below the Organisation for Economic Cooperation and Development (OECD) average, in 25<sup>th</sup> place, preceded by 20<sup>th</sup> place in France, but ahead of Great Britain (28<sup>th</sup>).<sup>[16]</sup> Italy's ISU score is 0.881, placed in the category of very high human development, however low levels of education are specific to many hospital inpatients, in particular those found in Internal Medicine wards. The level of education is one of the most important determinants of health (it is in fact associated with almost all the health indicators of a population) and is particularly important also for the full and conscious exercise of citizenship rights. According to ISTAT (National Statistics Institute),<sup>[17]</sup> expenditure on education and training – measured in relation to gross domestic product (GDP) – is one of the key indicators for assessing the policies implemented on the subject of growth and development of human capital. The Passi Report<sup>[18]</sup> also defines the direct relationship between the level of health and education. The population groups that claim to be more satisfied with their health are young people (87%), men (72%), and people with a higher level of education (79%), those who do not have financial difficulties (76%), who do not report severe pathological conditions. According to Eurostat,<sup>[19]</sup> levels of tertiary education vary widely between different Italian regions. All the central regions have values higher than the national average: in particular, in Lazio the indicator reaches the highest value (26.2%). Conversely, in the Southern regions, the lowest levels are recorded, the worst performances being found in Campania (12.9%) and Sicily (14.6%). The exceptions are Abruzzo (20.9) and Molise (24.4%), which boast levels above the Italian average. Among the Northern regions, the highest share of young graduates is found in Liguria (24.8%). The gender differential in education is favorable for women in all Italian regions. According to the OECD report,<sup>[20]</sup> Italy ranks at the top for life expectancy, at almost 83 years and people with a higher level of education can expect to live on average 6 years longer. The increase in life expectancy is linked to the improvement in care, related to reductions in mortality due to heart attack and stroke and to improvements in diabetes and cancer treatments. This has led to an increase in health spending (around 9% of GDP in the OECD countries). In

2013, Italy spent \$3,077 per capita compared to an OECD average of 3,453. Pharmaceutical spending has also increased up to \$ 800 billion (20% of health expenditure) in 2013 in OECD countries, mainly attributable to hospital expenditure. However, the OECD data shows that the health status of the elderly in Italy is unsatisfactory. Indeed, health indicators at the age of 65 are worse than the other OECD countries, the reason being that healthcare assistance for the aging population remains inferior as compared to other OECD countries, particularly in terms of quality of long-term care and patient monitoring. This is further exacerbated by risk factors such as increased obesity and difficulty in accessing certain specialized care services.

## CONCLUSIONS

The Internal Medicine department is positioned to play a central role in overall patient management in the hospitals of the future. Regional health planning cannot disregard the increasing burden of acutely ill patients with complex diseases on hospital networks, and the key function of Internal Medicine specialists in ensuring efficient and adequate patient management.

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