

Sex and age differences in health expenditure in northern Italy

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ABSTRACT

BACKGROUND: Little is known about the health care spending distribution across the age and sex gradient in European systems. The aim of the present study is to examine gender and age differences in health care utilisation in Lombardy, Italy.

METHODS: We analysed administrative data for the year 2010 in Lombardy (the largest Italian region, with about 10 million inhabitants) including spending for inpatient and outpatient services and pharmaceuticals. Data were aggregated across age and sex.

RESULTS: Lombardy in 2010 spent around 10.2 billion €, 51% of which for women. Age-standardised per-patient expenditure was however 5% lower for females than for males on average. Per-patient spending on elderly women (>65) was around 75% of the spending on men of the same age group. Further, health expenditure was higher for men for the treatment of chronic diseases. Importantly, the difference persisted after allowance for history chronic conditions.

CONCLUSIONS: Our results are in sharp contrast with the US based literature, and show that in Italy health expenditure in women is lower than in men. This may reflect inadequate attention to health care of women in Italy.

Key words: health services, gender, National Health Service

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INTRODUCTION

Although much has been written about the determinants of health spending (e.g. [1]), less is known about the distribution of the resources across population sub-groups. In particular, with the only notable exception of the USA, the role of sex differences in the allocation of health care expenditure has been little investigated.

A series of US based studies consistently found that women tend to use more services and spend more on health care than men. Alemayehu and Warner [2] reported that female lifetime expenditure for health care is one third higher than that of men. While two-fifth of the difference was due to the higher life expectancy of women, the remaining part was due to a higher health care consumption levels among females. This is consistent with the findings that US females generally have higher disease rates and are more likely to seek medical care [3,4]. Similarly, Owens [5] found that women use significantly more health services than men, the greatest disparity being in the population aged 45 to 64 years. With the onset of menopause, the frequency of several diseases increases, and this is one of the reasons why managed care organizations (MCO) focus on the care of postmenopausal women in the perspective that the use of proper screening, preventive care, and therapeutic treatments, can achieve significant reduction in overall costs. In a more recent study, Cylus et al. [6] found that, across all payers in the US, women spent in 2004 approximately \$1448 more per capita than males, accounting for about 59 percent of expenditure for physician and clinical services.

A recent study carried out in UK in an unselected cohort of 85 years old showed notable differences between sexes: women largely outnumbered men and had more diseases and disabilities [7]. However, although there is a pending quest from the literature to take the gender inequality in health care more seriously [8], little is known about the health care spending distribution across the age-sex gradient in European systems based on universal access to health care.

The aim of the present study is to examine gender and age differences in health care consumption (namely, inpatients, outpatients and pharmaceuticals) in 2010 in Lombardy, the largest Italian region with about 10 million

inhabitants and a long tradition in collecting information on health services. For this purpose, we analysed administrative data.

METHODS

All resident citizens in Lombardy are registered in a master file which contains major demographic characteristics. Health services delivered (inpatients, outpatients, pharmaceuticals) are collected and electronically registered for the quantification of prospective payments. These files contain demographic, administrative and clinical information on an individual basis and include all the services financed through the Regional Health Fund (which corresponds to approximately 80% of total health expenditure). The health services considered in this paper (inpatients, outpatients, pharmaceuticals) amounted to 10.2 billion € in 2010, which represented around 60% of the Regional Health Fund. In Lombardy outpatient services and pharmaceuticals are subject to co-payments, summing to 0.5 billion € per year. However, our data do not include information on co-payments.

In this paper, we present results for the year 2010. Through a Personal Identification Number (PIN) linking all the available individual records, subjects are assigned to specific diseases following a classification algorithm based on information regarding disease exemptions, specific outpatient services, drugs consumption (ACC codes) and diagnoses at discharge (ICD9CM). Each person can have up to 9 concomitant diseases. Subjects are then classified as "chronic" if they have one of the following conditions: chronic respiratory diseases, cardiovascular diseases, neoplasms, neurophysiological diseases, transplants, dyslipidemia, endocrine diseases, diabetes, gastric diseases, liver diseases, kidney diseases, autoimmune diseases. "End of life" patients are the ones who died in 2010, while "non chronic" are the ones that did not fall into any of the above categories.

RESULTS

In Lombardy in 2010, the peak in the population was reached around 40 years old. This pattern is linked to immigration, which in

Lombardy represents a prominent phenomenon. Men outnumbered women at young age, but after 50, females start outnumbering men. The number of patients was constantly around 80% of the overall population, although for men over 70 and women over 75 almost all the residents became health care consumers. Across the whole life cycle, patients were in general more likely to be females than men. While for the elderly (≥ 60) this pattern reflected the demographic trend (there were more women), for the younger residents this showed that females were more likely to consume health care.

Men were less likely to consume health care. However, the distribution of patients across different conditions was similar. Chronic conditions represented more than 70% of all the cases of health care consumption for the over 65, while they were around 30% for the whole population. Given the numbers of health care consumers, total expenditure was higher for females than for males. In total, Lombardy spent around 10.2 billion € in inpatients, outpatients, pharmaceuticals in 2010, 51% of which on women. In absolute terms, women outspent men of around 300 million euros. The distribution of expenditure across conditions, however, did not reflect the distribution of the number of patients. Most of the expenditure was on chronic conditions (around 70% for the under 65, 82% for the over 65), with little difference between men and women. Per-patient expenditure was 4 to 6 times higher for chronic than for non-chronic conditions (results not reported).

Total expenditure and number of patients are important. However, fairness in the allocation of resources can be evaluated only by looking at the age-gender-specific spending per person. Per-patient expenditure (average expenditure for an health care consumer) is reported in the last row of Table 1. Each female patient spent, on average, 5% less than a corresponding male. This difference increased in the over 65: average expenditure on elderly women was around 75% of the expenditure on men of the same age.

This pattern is even clearer in Figure 1, where the per-patient expenditure is reported across sex and age. Apart from reproductive age, when, for a 20 years interval women consumed more resources than men on average, per-patient expenditure was higher for men. In

the peak, men spent almost 1000€ (40%) more than women. Chronic conditions were always more expensive than the average, for both men and women. Importantly, men spent more than women in chronic conditions above age 45. Indeed, most of the difference in per-patient expenditure was due to the higher costs of men for chronic diseases.

A useful approach to understand the size and the impact of the gender differences in health care expenditure was to calculate the effect of the different per-patient expenditure on total spending. More precisely, how much would have been the total expenditure if females had consumed the same amount of per-patient resources of men (i.e. "male equivalent" expenditure)? In total, if females had consumed per-patient as much as men did in 2010, total expenditure would have been almost 800 million euros higher in Lombardy (7.8% of the total expenditure in 2010).

Do different genders consume different services at different ages? Figure 2 reports the female to male per-patient spending across age groups for different services. A value of one indicates equality (by gender) in per-patient spending. At its peak, the curve shows that the average spending for the hospitalizations of women was almost 3 times higher than for men, but this was entirely due to health care during reproductive age. Women kept spending more in outpatient care than men up until they are 65 years old, but the ratio for hospitalizations and pharmaceuticals rapidly fell below 1 already above age 45.

As reported in Table 1 and Figure 1, chronic conditions account for over 80% of total expenditure. Men spend on average more than women in these categories. This difference may be due to the different chronic conditions of men and women. In other words, men might be more complex patients on average, and have diseases that are more difficult and expensive to treat. Figure 3 shows the difference in per-patient expenditure when the number of contemporary chronic conditions is taken into account. Expenditure was always higher for men. The difference between the two sexes widened the more complex the cases: men affected by complex conditions spent significantly more than women in the same situation. This is confirmed also for the end-of-life period, where, if anything, spending was relatively even more biased towards men.

Looking within the black box of the number of chronic condition, Table 2 shows the total and the per-patient expenditure for

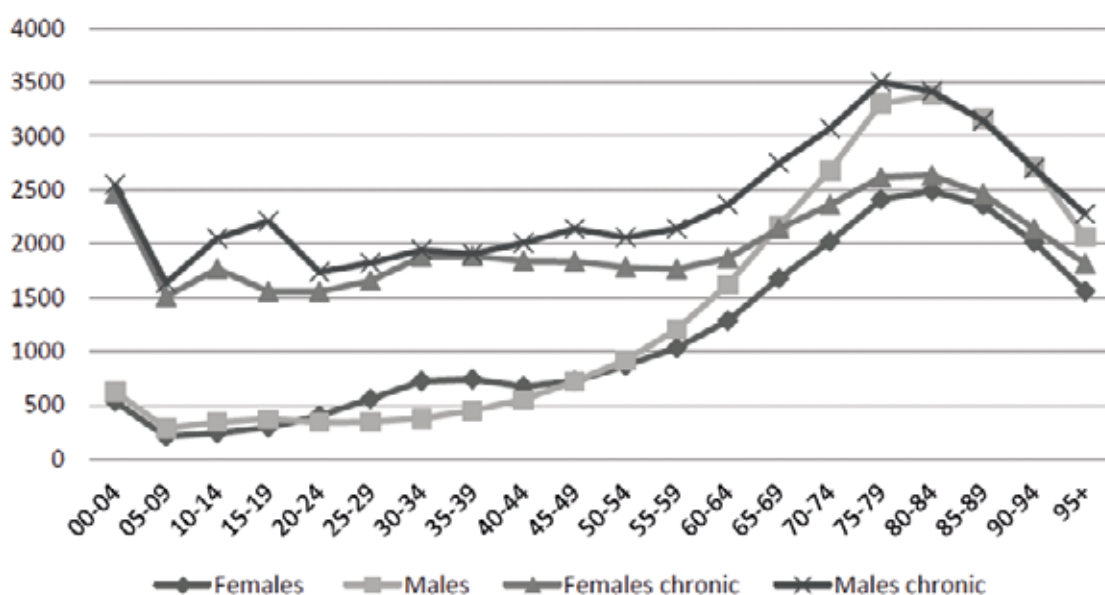
different macro areas of chronic diseases. In the last two columns it is also reported the female to male ratio in total and average

TABLE 1

TOTAL POPULATION AND NHS EXPENDITURE IN LOMBARDY IN 2010, BY AGE, SEX AND TYPE OF CONDITION				
	FEMALES		MALES	
	OVERALL	OVER 65	OVERALL	OVER 65
POPULATION THOUSANDS)	5.069	1.207	4.803	864
OF WHICH (%)				
NON_CONSUMER	13.18	3.84	20.46	4.57
CHRONIC	32.76	72.83	28.70	73.34
NON-CHRONIC	53.15	19.86	49.96	18.06
END-OF-LIFE	0.91	3.47	0.87	4.03
TOTAL EXPENDITURE (BILLIONS €)	5.21	2.56	4.97	2.41
%				
NON_CONSUMER	0	0	0	0
CHRONIC	68.00	82.67	71.80	82.25
NON-CHRONIC	25.75	6.86	19.99	4.53
END-OF-LIFE	6.25	10.47	8.20	13.22
PER-PATIENT EXPENDITURE (€)	815.36	2213.58	854.07	2922.54

FIGURE 1

PER-PATIENT SPENDING BY AGE AND SEX, IN TOTAL AND FOR CHRONIC CONDITIONS. LOMBARDY, ITALY 2010



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expenditure. Clearly, females consumed less on average in most of the conditions analyzed. However, again, the F/M ratio in per-patient expenditure was substantially reduced when

patients with more than one condition were considered. Within this category, spending was higher for females only for transplants.

FIGURE 2

FEMALE TO MALE PER-PATIENT SPENDING BY AGE AND TYPE OF SERVICE. LOMBARDY, ITALY 2010

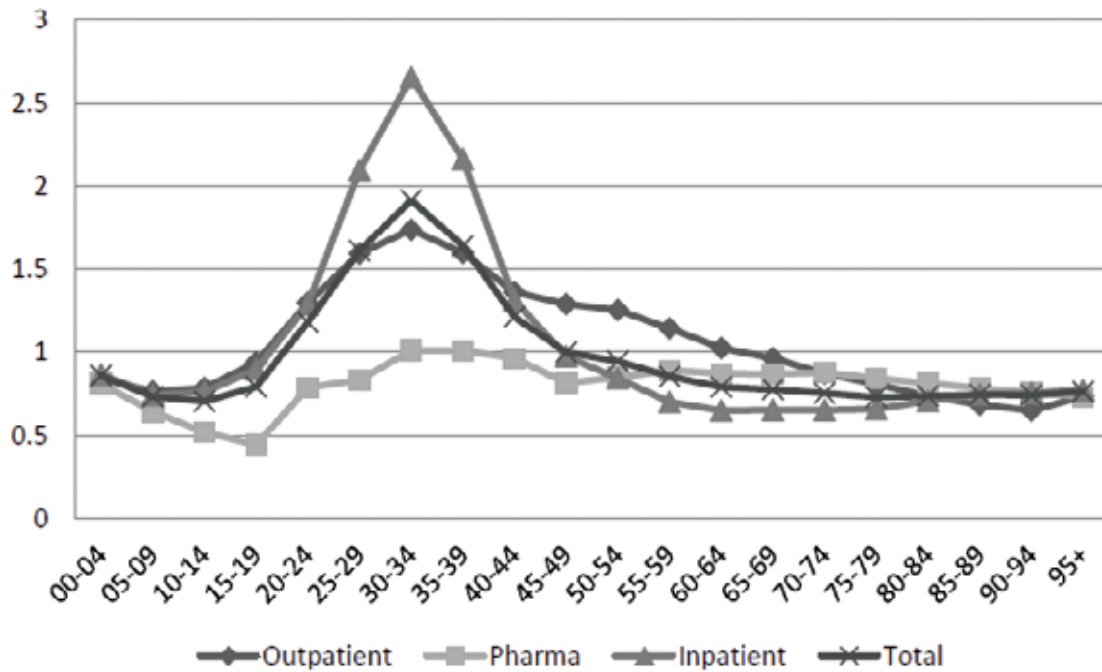


FIGURE 3

PER-PATIENT SPENDING FOR NUMBER OF CHRONICITIES. LOMBARDY, ITALY 2010

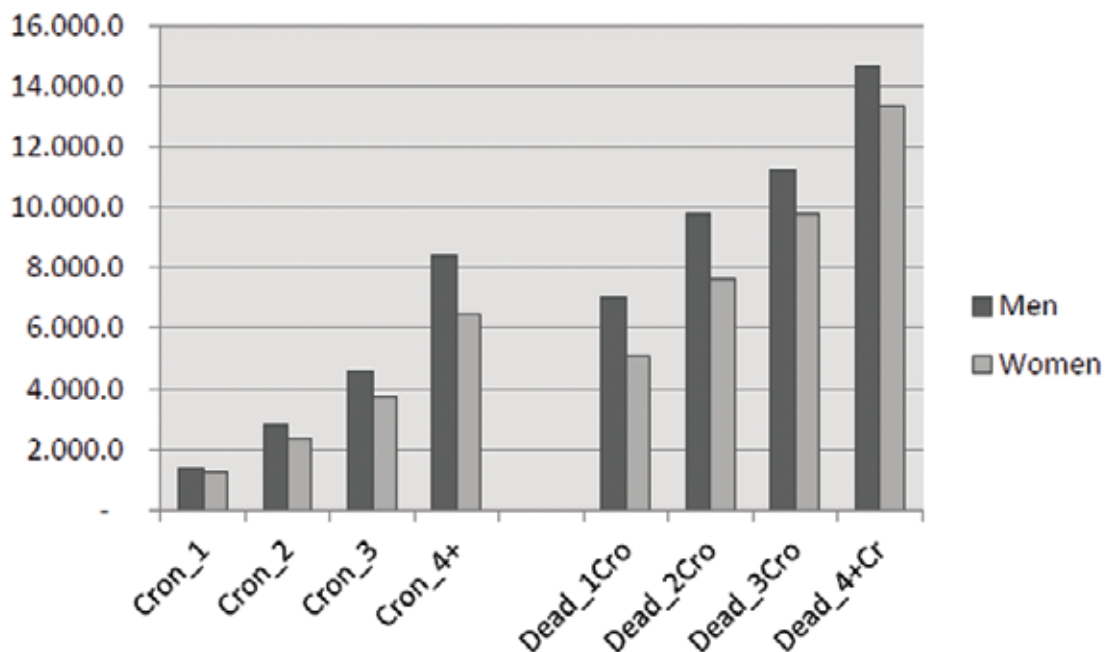


TABLE 2

CONDITIONS AND SPENDING BY SEX										
	TOTAL EXPENDITURE				PER-PATIENT EXPENDITURE (€)				F/M PC EXPENDITURE	
	WOMEN		MEN		WOMEN		MEN		ONE CHRONICITY	> ONE CHRONICITY
	ONE CHRONICITY	> ONE CHRONICITY	ONE CHRONICITY	> ONE CHRONICITY	ONE CHRONICITY	> ONE CHRONICITY	ONE CHRONICITY	> ONE CHRONICITY		
TRANSPLANTS	1.1	63.6	2.1	109.1	4512.9	25878.8	6521.6	23459.9	0.69	1.10
KIDNEY FAILURE	4.8	166.9	6.1	281.7	6670.1	12956.5	5950.7	12921.5	1.12	1.00
HIV	3.7	58.5	9.4	152.6	8334.2	12611.2	8850.7	12812.1	0.94	0.98
CANCER	211.4	718.8	147.7	782.3	3142.6	5377.6	3221.6	6634.9	0.98	0.81
DIABETES	29.7	577.0	38.8	774.9	901.3	3201.7	807.8	3783.4	1.12	0.85
CARDIOVASULAR	441.2	1832.3	397.2	2100.8	1068.9	3155.8	1110.4	3953.4	0.96	0.80
RESPIRATORY	65.1	307.9	74	399.2	920	3807.7	953.5	5088.3	0.96	0.75
GASTRO	143.9	1236.9	124.2	1323.2	1072	3951.8	1039.7	5279.7	1.03	0.75
NEUROLOGIC	123.8	472.3	106.5	432.9	2489	4966.7	2466.2	6108.9	1.01	0.81
AUTO-IMMUNE	16.7	168.0	5.6	44.8	939.6	2444.2	1696.3	3560	0.55	0.69
METABOLIC DISEASES	97	1019.9	47.8	1119.4	806.8	2765.4	939.1	3699	0.86	0.75

DISCUSSION

In this paper, we analysed the gender differences in the utilization of health care resources at different ages in Lombardy in 2010. Females consumed more health care during the reproductive age. Men did not have the same peaks, but tended to consume constantly more, especially for chronic conditions. Finally, per-patient expenditure was lower for females than for males. The result persisted once disease-specific per-patient spending is taken into account.

These findings are in contrast with most US based literature [2,5,6]. Although also in Lombardy the overall expenditure for women was higher than for men, the difference is small, women accounting for only 51% of the total health care expenditure, as opposed to figures varying between 60% to 70% in the US studies. More importantly, age-specific per-patient spending in all the US is significantly higher for females.

The reversed gender gap in health care expenditure for Lombardy may be considered as a sign that the Italian NHS is not pushing hard enough on women's health. In general, fairness in health care does not imply that everyone is allocated the same share of resources. On the contrary, more resources should be allocated to the ones with greater needs or, in the utilitarian approach used, for example, by the NICE in the UK, to the

ones that can benefit more. Along this line, US studies might as well show that women do need more resources than men, and that the Italian NHS should pay more attention to women's health care. This would be consistent with the literature finding lower utilization and quality of diagnostic [9,10] and health care services offered to women [11,12], even in high income countries, particularly, for cardiac procedures and interventions [13]. This explanation would also fit with the findings from the epidemiological literature showing that cardiovascular diseases in women are often silent and fatal [14,15], dementia incidence is higher [16], diabetes prevalence is higher, especially among old women [17], when they experience significantly higher disease counts [7].

On the other hand, the different allocation of resources across genders in Italy and in the USA might stem from differences in the health systems.

The Italian National Health Service (NHS) is a tax-based universal health coverage system, organised in three levels: national, regional and local. Although minimum healthcare provision standards should be equally met across the whole country and cross-regional transfers of resources are common, regions maintain a high degree of autonomy in setting their own organizational frameworks. The health system in Lombardy is often defined as a quasi-market, where the single buyer (the region) acquires

services from a series of private and public providers. Patients are free to choose any certified provider of health services, but do not pay directly. Providers are remunerated by the region for each service, generally according to a tariff-system based on prospective payments (Diagnosis-related groups, DRGs for inpatient, tariffs for outpatient services). DRG tariffs are set by the region and updated regularly [18]. Reimbursement prices of pharmaceuticals are set through various mechanisms, normally at national level. DRGs, tariffs and reimbursements represent the value of the services reported in the administrative data.

Given the Italian regulatory framework, some points are useful discussing. First of all, reimbursement tariffs are not set by market forces. This implies that high demand levels are not necessarily associated to high prices. Second, any Lombardy resident has a universal access to health care services. Health care consumption should thus reflect health needs and should not be influenced by economic conditions. Third, in this context the administrative data can be seen as the complete list of services “bought” by the region at pre-defined prices. Expenditure is just the sum of all these values. Fourth, people can still decide to consume health care outside the tax-based system (e.g. for specialist visits). Moreover, fixed fees and co-payments are generally required for both health care services and pharmaceuticals. These out-of-pocket expenditures are not included in the administrative data.

The difference with the US system is thus substantial. In particular, the USA are considered more medicalised and demand driven than most European country. To the extent that this higher medicalisation is gender biased, with women asking more services

than men, part of the gap could be explained. Moreover, prices of health care are different from one country to another. In the USA, higher prices are to be expected for highly demanded services. Consequently, these services would be relatively more expensive in the USA than in Italy. Also, differently from Italy, the USA did not guarantee universal access to health care. This again could potentially bias the comparison, since it is difficult to estimate what would the gender gap be in the US if also low income demand was included.

Our study includes only expenditure for some health care services. This might represent a source of bias. For the case of dementia in Germany, for example, Schwarzkopf et al [19] found that women use less health care and more long term care. Also, women are associated to higher life expectancy and lower chronic conditions. Family and informal care can thus be more important for women than for men. However, our data, as most of the existing literature, cannot take these resources into account.

Further investigation is needed on the topic. Should such a gender gap in per-patient expenditure be confirmed, the source of this differences should be clarified. This should represent a priority for health policy and public health experts and practitioners.

CONCLUSIONS

Our results are in sharp contrast with the US based literature showing that health expenditure in women is greater than in men. This may reflect inadequate attention to health care of women in Italy.

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