Healthcare expenditures on Italian households with elderly members: impoverishment and catastrophic payments

Spese Sanitarie nelle Famiglie con Anziani: Cause di Impoverimento e Spese Catastrofiche

Doglia Marco

ISTAT, DPTS, DCCV, Servizio condizioni economiche delle famiglie

Spandonaro Federico

CEIS Sanità, Facoltà di Economia, Università di Roma "Tor Vergata"

Riassunto: il lavoro, utilizzando un framework metodologico proposto dall'OMS per valutare la *fairness* dei sistemi sanitari, indaga i rischi di impoverimento e di dover sostenere spese catastrofiche a causa di consumi sanitari *out of pocket* delle famiglie. Utilizzando i dati ISTAT sui consumi delle famiglie, si analizza specificamente il rischio che comporta la presenza di anziani nei nuclei, e i motivi (legati ai consumi sanitari) che più frequentemente portano all'impoverimento o alla spesa catastrofica.

Keywords: healthcare, poverty, impoverishment, ageing, elderly peoples.

1. Introduction

The CEIS report 2004 on healthcare(1), for the first time, introduced in Italy the fairness approach to analyze equity of healthcare system.

This approach was proposed by the World Health Organization (WHO): actually, WHO suggests to integrate *income space* measures of health, with the so-called *burden space* measures.

Measures in the *income space* refer to an "ex-ante" specification of equity: in fact they are based on changes of the income distribution due to healthcare tax payments.

Measures in the *burden space*, instead, analyse the phenomenon "*ex-post*", comparing households out of pocket health expenditures with their capacity to pay.

The CEIS report on healthcare 2005 concentrated on the very issues of impoverishment and catastrophic payments for healthcare, relating these phenomenons to the different levels of consumption and to the regional residence of households.

To justify why, for assessing equity of the health care system, we pay great attention to the out of pocket healthcare expenditures impact on households' balances(2), consider that we assume that a universalistic and comprehensive health care system, like the Italian National Health System (INHS), should decoupling health needs and economic burden.

¹() The CEIS report on healthcare is annually edited by the CEIS department of the University of Roma *Tor Vergata*.

²() Cfr. Maruotti A., Mennini F.S., Piasini L., Spandonaro F., L'equità e la fairness del Servizio Sanitario Nazionale Italiano, in Rapporto CEIS Sanità 2004.

In this contribute we have specifically focused on the ability of the INHS to preserve elderly peoples (namely the households with elderly components) from economic risk. In other terms, we've tested the relationship between elderly peoples presence into the household and the probability of impoverishment and catastrophic payments.

2. Databank and methodology

We use the approach of Murray and others (2003) that has been developed into the WHO framework.

The overall goal of the approach is to assess the impact of out of pocket healthcare expenditures on the household balances(3), comparing the former with household's capacity to pay.

Besides, the variability of the share of healthcare out of pocket expenditures on total expenditures is taken into account.

As already stressed in the CEIS report 2005(4), a shortcoming of this approach is its sensitivity to the choice of the thresholds for impoverishment, catastrophicity and subsistence.

Thresholds proposed by WHO are based on a mere subsistence concept, namely on food consumption. In this contribute, as in the CEIS Health report, we have considered ISTAT absolute poverty line to evaluate households' capacity to pay, as well as ISTAT relative poverty line for impoverishment. Reason is that we feel that in a developed country, like Italy, a subsistence expenditure level is meaningless.

Another implicit limit of this methodology is the fact that it does not consider the households' savings and then wealth; while this is of little relevance for developing countries, it may cause some kind of bias applying the methodology to a developed country. Unfortunately, with the data sets currently available, it does not seem possible to overcome this limit.

Our analysis utilizes ISTAT annual survey on household consumption (year 2004): the so called households' budget survey (HBS); variables considered are: total consumption, number of components, number of elderly components, food expenditure and health out of pocket expenditure.

The health out of pocket expenditure has been obtained summing the expenses for hospitalization (both public and private), emergency room, specialist health care, nursery and assistance to the old and the handicapped, dentistry, purchasing or renting of medical machineries and accessories, prosthesis, pharmaceutical and thermal cares.

The food consumption has been taken out from the "purchase booklet" summing, net of expenditures for alcoholic beverages, tobacco and food consumed outside the house (in hotels, restaurants, pizzerias and similar).

In this contribution we have considered an elderly person an household's member who is more than 65 years old: some more considerations will be made if the elderly line is moved up to 75 years.

³() For details on the methodology see Maruotti A., Mennini F.S., Piasini L., Spandonaro F., L'equità e la fairness del Servizio Sanitario Nazionale Italiano, in Rapporto CEIS Sanità 2004.

⁴() see Doglia M., Spandonaro F. (2005), La fairness del Servizio Sanitario Nazionale Italiano, in Rapporto CEIS Sanità 2005.

In the health out of pocket expenditure, we have included the expenses for assistance to the handicapped as well as to the not self caring elderly peoples.

Although these kind of expenses are not really health expenditures, we considered that their inclusion is useful in order to analyse disability impact.

According to the WHO approach, the households' capacity to pay has been evaluated from the effective standardized non-subsistence consumption level.

The adhesion to the WHO approach seems to be compulsory: in fact income data in the Italian HBS are not reliable enough (and they are not officially released); consequently consumption has been implicitly considered a proxy for income.

Consistently, in the following analysis, we have partitioned the sample in consumption quintiles, dividing it by the household equivalent size.

3. Preliminary remarks on impoverishment

In our analysis, households' impoverishment occurs if households' consumption, net of health care out of pocket expenditures, results under the relative poverty line.

Obviously in this analysis poor households are excluded.

First of all we have analyzed our sample for association between some households' characteristics and impoverishment: the Chi-square test for association has been considered, being the null hypothesis that of no association. Variable tested have been: standardised consumption quintile (*scq*), number of households' members (*nhm*), number of elderly members in the household (*nhe*), region of residence (*region*), age of the reference person (*arp*), household typology (*htp*).

All tests (See table 1) have lead to reject the null hypothesis with a very high level of confidence.

Table 1: Association indices between impoverishment and other households' characteristics

Variable	Chi square	Phi Coefficient
	significativity level	value
nhm	<,0001	0,0273
arp	<,0001	0,0730
nhe	<,0001	0,0739
region	<,0001	0,0705
htp	<,0001	0,0862
scq	<,0001	0,3092

Delving deeper on the impoverishment, we can observe that, both in the first and second quintiles, the incidence of impoverished households among those with elderly members is twofold the incidence among households without; moreover a large portion of the impoverished households have at least one member over 65 years old (See table 2).

Finally, moving elderly line up to 75 years does not actually change the results: in fact the share of impoverished households with at least an elderly person on households with elderly members merely rises from 7% to 7,6% in the first quintile and from 1,3% to 1,6% in the second one.

Table 2: Rate of impoverished households and presence of elderly components 1° e 2° quintiles of equivalent consumption - Italy 2004

Quintila	Impoverished households on	WITH BINERIA NEARINGS		Impoverished households without elderly peoples		
Quintile	total households	on impoor households	on households with elderly peoples	on impoor households	on households without elderly peoples	
1 st quintile	5,4%	66,9%	7,0%	33,1%	3,8%	
2 nd quintile	1,0%	56,6%	1,3%	43,4%	0,7%	

Obviously, assessing the causal relationship between the presence of elderly components in the household and impoverishment due to health expenditures is not straightforward.

For sure, the morbidity and disability of the elderly peoples is a necessary condition for impoverishment due to health care consumption: unfortunately this kind of information is not available in the HBS.

In our analysis we limit our interest to appraise if the IHNS has been able to decoupling health needs and economic risk, i.e. if the impact of health expenditures on the balances of the households with elderly components does not show significantly differences from that of households without elderly members.

As suggested by WHO a logistic model, has been adopted, with impoverishment as the endogenous variable and standardised income quintile, region of residence (aggregated into three areas North, Centre and South) and number of elderly members as the exogenous variables.

All the model parameters are significant at a very high level of confidence, this stills holds true even if they are considered as a whole; beside the model has an high predictive capability.

The odds ratio analysis shows that the probability of impoverishment of an household with one elderly person is between 1,41 and 1,43 times that of an household without elderly members; moreover when the elderly components are two or more, the household's probability to impoverish is twice that of households without elderly.

Table 3: *Logistic model*

Test for Global Null Hypothesis: BETA=0					
Test		Significance level (Pr > ChiSq)			
Likelihood	Ratio	<,00	01		
Score	2	<,00	01		
Wald		<,0001			
Analysis of Maximum Likelihood Estimates					
Parameter	Estimate	Error	Pr > ChiSq		
Intercept	-2,4817	0,00583	<,0001		
Nhe 1	0,3528	0,00453	<,0001		
Nhe 2 or more	0,7398	0,00523	<,0001		
Area North	0,2235	0,00595	<,0001		

Area South	0,3773	0,00569	<,0001	
Scq 2	-2,6199	0,00527	<,0001	
Scq 3	-5,8878	0,0249	<,0001	
Scq 4	-7,6519	0,0609	<,0001	
Scq 5	-7,4198	0,0549	<,0001	
	Odds Ratio	Estimates		
Effect	Estimate	Confidence Limits		
Nhe: 1 vs. 0	1,423	1,410	1,436	
Nhe: 2 or more vs. 0	2,095	2,074	2,117	
Area: North vs. Center	1,250	1,236	1,265	
Area: South vs. Center	1,458	1,442	1,475	
Scq: 2 vs. 1	0,073	0,072	0,074	
Scq: 3 vs. 1	0,003	0,003	0,003	
Scq: 4 vs. 1	<0,001	<0,001	<0,001	
Scq: 5 vs. 1	<0,001	<0,001	<0,001	

The model confirms, as well, the great relevance of household capacity to pay on the impoverishment probability.

4. Reasons for impoverishment

To appreciate which motives are likely to induce greater impoverishment probability for households with elderly peoples, consider the average out of pocket expenditures of impoverished households: table 4 contains figures for households without elderly components, while table 5 for that with elderly members.

As it was expected, impoverished households belong only to the first and second quintile.

To analyse differences in the behaviour of households with and without elderly components, it is useful to look at the composition of average health expenditures; it is worth noting that while the mean expenditures for disability(5) and dental care for the whole population are very low (4,1 and 19,1 euros respectively) they dramatically rise (to 272,3 and 368,9 euros respectively) when they are computed only on the subset of households that have actually sustained that kind of expenses.

Hospitalization average disbursement shows a similar increase (from 1,4 to 285,8 euros) but this is mostly due to low levels in the first two equalized consumption quintiles (41,1 and 73,1 euros respectively) and very high levels in the upper quintiles (209 and 543,8 euros respectively); these figures suggest that richest households have an attitude to purchase private health services; this is likely to occur because they prove to be unsatisfied of INHS. Moreover hospitalization does not seem to take households without elderly members to impoverishment.

Comparing average consumption for impoverished households with and without elderly members it emerges that average expense for disability results 60% higher in the

⁵() As already stated, in our study disability expenditures comprises: assistance to elderly and disabled peoples, private nurses, physiotherapy, curative gymnastics etc.

impoverished households where elderly peoples are present; in addition, in those households disability expenses seem to be more concentrated on the assistance to the disabled.

Consider that from our data also emerges how pharmaceutical, dentistry and specialists are a matter of concern both for impoverished and not impoverished household.

For impoverished households with elderly components about 41,5% of the health expenditures account for pharmaceutical, 15,8% for dental care and 15,6% for specialists care.

We think this is a point for revising exemption (from ticket) rules: evidently current exemption regulation (while we know it is not very selective) is not able to protect households from a relevant economic burden.

However, in our opinion, disability, specialists and pharmaceutical expenditires are the most relevant motive of impoverishment for households with elderly members.

Moreover while impoverishment risk rises modestly when the elderly threshold is moved up to 75 years, the share of disability related expenditure for impoverished households with elderly peoples goes up of about 5 points.

We know that in INHS there is no coverage for disability needs; actually a debate on the possibility to unveil a national assurance for long term care exists, but it becomes stranded as it face the scarcity of public financial resources. However, we should observe that in the meanwhile households are obliged to front disability needs by themselves, and this is a cause of fragility for households with elderly components. In fact in the subset of households with elderly members the share of health consumption devoted to disability increase drastically.

Definitely, we feel that long term care coverage is firstly an equity issue.

Table 4: Composition of health related out of pocket expenditures by equivalent consumption quintiles

Impoverished households without elderly components - Italy 2004

Variable	1 st quintile	2 nd quintile
Hospital	0,0%	0,0%
Specialist	22,3%	10,0%
Dentist	12,0%	47,3%
Analysis	6,6%	6,3%
Prostheses and Apparatus renting	5,6%	7,6%
Thermal	0,0%	0,0%
Pharmacy	51,5%	25,4%
Disability and Auxiliary Services	1,9%	3,4%

Table 5: Composition of health related out of pocket expenditures by equivalent consumption quintiles

Impoverished households with elderly components - Italy 2004

Variable	1st quintile	2 nd quintile
Hospital	0,1%	3,5%
Specialist	14,3%	19,9%
Dentist	8,1%	13,2%

Analysis	7,0%	7,3%
Prostheses and Apparatus renting	8,3%	4,8%
Thermal	0,0%	0,5%
Pharmacy	55,5%	24,7%
Disability and Auxiliary Services	6,6%	26,1%

5. Preliminary remarks on catastrophic payments

Murray et al. (2003) defined catastrophic expenditures (from now cata) those out of pocket payments that are greater than 40% of the household's capacity to pay.

Capacity to pay is defined as the consumption capability of an household net of the subsistence level of consumption (this has been estimated in our model by the ISTAT absolute poverty line).

Obviously the threshold is somewhat arbitrary, but is high enough to indicate a real phenomenon.

As already done with impoverishment we have tested association between the presence of catastrophic payments and main households characteristics, results are shown in Table 6; as can be seen all tests allow to reject the null hypothesis of no association with a very high level of confidence, it is interesting to see how except for income quintiles the association detected between cata and household main characteristics is higher than that between impoor and the same characteristics. This makes us think that cata may be less connected with morbidity than impoverishment.

Table 6: Association indices between catastrophic payments and other households' characteristics

Variable	Chi square significance level	Phi Coefficient value
nhm	<,0001	0,06814
arp	<,0001	0,13203
nhe	<,0001	0,13069
region	<,0001	0,12346
htp	<,0001	0,14798
scq	<,0001	0,25170

As a whole 4,2% of the Italian households are subject to catastrophic payments, and 2,9% have elderly components.

We find out households subjected to cata mainly in the first consumption quintile: however this is partly due to the fact that poor households are not excluded from this analysis, i.e. poor households are more likely to incur in cata as they have very low capacities to pay.

Households with elderly peoples count, always but in the fifth quintile, for more than 66% of the cases of catastrophic payments (See table 7).

Table 7: Rate of households subject to catastrophic payments by quintiles of equivalent consumption - Italy 2004

Quintile	Cata households on total households	Cata households with elderly components on cata households
1st quintile	14,3%	67,9%
2 nd quintile	2,6%	69,5%
3 rd quintile	1,5%	72,4%
4 th quintile	1,3%	72,3%
5 th quintile	1,5%	56,4%
Whole Italy	4,2%	67,9%

Differently from impoverishment, a catastrophic payment may be the consequence of a free choice and not necessarily it deprives economically the family, this may be true at least in the richest quintiles.

In fact households impoverished and that subject to catastrophic payments are quite different sets

We think worthwhile to investigate the distribution of catastrophic payment, because they are able to suggest which expectation are likely to be not covered by INHS, or when the household perception is to face a not satisfactory service: in this last case, households than can afford to pay will provide by themselves.

6. Motive of catastrophic payments

In the present contribution we focus on catastrophic payments of the households with elderly components: you can refer to CEIS Health Report for an overall analysis.

Comparing the composition of health out of pocket expenditures of households with and without elderly members (in the subset of households subject to catastrophic payments) we observe that dentistry and disability expenditures assume a relevant role.

Households without elderly peoples, that can afford dental care, face for this a very big impact: in the richest quintile more than 75% of the consumption is devoted to dental care.

In the set of households with elderly members, disability needs seem to be predominant. Although the share of dental care out of pocket expenditures is still increasing on the quintile, the trend is counterbalanced by the necessity to devote resources to disability.

Again we feel that this may demonstrate that, the lack of coverage on dentistry, involve an equity problem: only well-off families can afford quality dental care.

We'd like also to point out that well-off households show an attitude to use private hospital services (not for free): we can infer that households are not fully satisfied of the health services provided by the INHS: those who can afford to pay are likely to purchase private services. In terms of health policies it does imply an implicit incentive to opting out.

Table 8: Composition of health related out of pocket expenditures by equivalent consumption quintiles

Households without elderly components subject to catastrophic payments - Italy 2004

Variable	1 st	2 nd	3 rd	4 th	5 th
Variable	quintile	quintile	quintile	quintile	quintile
Hospital	0,3%	0,0%	1,1%	0,6%	7,6%
Specialist	16,0%	18,0%	3,8%	0,9%	1,3%
Dentist	10,3%	34,1%	53,1%	74,1%	76,3%
Analysis	8,4%	7,9%	5,9%	1,7%	0,8%
Prosthesis and Apparatus renting	5,6%	9,6%	16,6%	6,6%	4,5%
Thermal	0,0%	0,0%	0,0%	0,0%	0,9%
Pharmacy	58,2%	26,7%	12,6%	2,3%	2,9%
Disability and Auxiliary Services	1,1%	3,6%	6,8%	13,8%	5,6%

Table 9: Composition of health related out of pocket expenditures by equivalent consumption quintiles

Households with elderly components subject to catastrophic payments - Italy 2004

Variable	1 st	2 nd	3 rd	4 th	5 th
variable	quintile	quintile	quintile	quintile	quintile
Hospital	0,3%	1,5%	0,5%	7,2%	11,1%
Specialist	11,7%	16,1%	8,5%	5,3%	3,2%
Dentist	6,2%	7,1%	13,9%	26,4%	39,0%
Analysis	5,6%	6,1%	4,5%	5,2%	0,3%
Prostheses and Apparatus renting	5,2%	8,9%	3,2%	2,6%	10,4%
Thermal	0,0%	0,2%	0,0%	1,1%	3,5%
Pharmacy	63,2%	35,8%	30,4%	11,6%	5,8%
Disability and Auxiliary Services	7,8%	24,4%	39,0%	40,6%	26,7%

7. Conclusions

The above indicates that the INHS does not fully protect households with elderly members from the economic burden due to health needs.

Households with elderly components show a significant fragility, assessed both from an impoverishment and from the catastrophic payments point of view.

There is statistical evidence of association between the presence of elderly peoples in the household and both impoverishment and catastrophic payments; moreover all our analyses seem to confirm that the presence of one or more elderly members in the household dramatically rises the risk of impoverishment. In fact the rate of impoverished households doubles in presence of elderly members (1,3% compared to 0,7% in the first equivalent consumption quintile and 7,0% compared to 3,8% in the second one). Even when catastrophic payments are considered it emerges that, in all

quintiles with the exception of the fifth, cata households with at least one elderly member account for more than 66% of households subject to catastrophic payments.

Reasons for fragility seem to be related to an increase of expenditures to face disability (obviously including assistance to the not self caring elderly peoples) and to an augmented pharmaceutical expenditure.

Actually the share of consumption devoted to disability by impoverished households is consistently higher in presence of elderly members (6,6% compared to 1,9% for households belonging to the first quintile of consumption and 26,1% compared to 3,4% for those belonging to the second consumption quintile). A similar phenomenon can be noticed also for cata households; they also present relevant differences in the share of pharmaceutical expenses. This phenomenon is particularly evident when higher consumption levels are considered.

We think that much more attention has to be devoted to equity issues: the universalistic principle at the foundation of the INHS can let us be under the illusion that in Italy we are free from equity shortcomings.

The present contribution stress how some regulations (but also some lack of regulation) imply significant disparity, at least in the so-called burden space (WHO 2004): in this context households with elderly members are an especially at risk subset.

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Annex

Table A1: Composition of health related out of pocket expenditures by equivalent consumption quintiles

Non poor households – Italy 2004

Variable	1 st	2 nd	3 rd	4 th	5 th
	quintile	quintile	quintile	quintile	quintile
Hospital	0,1%	0,6%	0,8%	0,8%	2,6%
Specialist	13,8%	14,3%	14,6%	12,5%	11,8%
Dentist	5,6%	9,5%	11,8%	18,7%	28,9%
Analysis	6,2%	7,2%	8,6%	6,9%	6,3%
Prostheses and Apparatus renting	4,3%	5,8%	5,8%	6,6%	8,6%
Thermal	0,0%	0,3%	0,2%	0,2%	0,7%
Pharmacy	67,2%	57,3%	52,8%	47,3%	33,7%
Disability and Auxiliary Services	2,8%	5,0%	5,4%	7,0%	7,4%

Table A2: Composition of health related out of pocket expenditures by equivalent consumption quintiles

Households not impoverished without elderly components - Italy 2004

Variable	1 st	2 nd	3 rd	4 th	5 th
	quintile	quintile	quintile	quintile	quintile
Hospital	0,0%	0,4%	1,0%	0,3%	2,7%
Specialist	13,6%	15,0%	15,7%	14,0%	11,9%
Dentist	2,7%	12,0%	14,8%	22,7%	33,2%
Analysis	8,3%	8,4%	10,9%	7,9%	7,3%
Prostheses and Apparatus renting	3,3%	5,2%	6,5%	6,7%	8,3%
Thermal	0,0%	0,4%	0,1%	0,1%	0,3%
Pharmacy	72,0%	56,9%	49,5%	45,2%	32,5%
Disability and Auxiliary Services	0,0%	1,8%	1,6%	3,3%	3,9%

Table A3: Composition of health related out of pocket expenditures by equivalent consumption quintiles

Households not impoverished with elderly components - Italy 2004

Variable	1 st	2 nd	3 rd	4 th	5 th
	quintile	quintile	quintile	quintile	quintile
Hospital	0,0%	0,5%	0,3%	1,5%	2,5%
Specialist	10,0%	13,2%	13,2%	10,0%	11,6%
Dentist	1,9%	3,6%	7,7%	12,2%	21,3%
Analysis	4,3%	5,9%	5,7%	5,4%	4,4%
Prostheses and Apparatus renting	0,2%	6,5%	4,7%	6,6%	8,9%
Thermal	0,0%	0,1%	0,3%	0,4%	1,3%
Pharmacy	83,0%	63,8%	57,7%	50,7%	36,1%
Disability and Auxiliary Services	0,7%	6,4%	10,4%	13,1%	13,9%