

Equity in access to health care in Italy: a disease-based approach

Cristina Masseria¹, Margherita Giannoni²

¹ London School of Economics and Social Science, LSE Health, London, UK

² Università degli Studi di Perugia, Dipartimento di Economia, Finanza e Statistica, Perugia, Italy

Correspondence: Cristina Masseria, London School of Economics and Social Science, LSE, Health, Houghton Street, London WC2A 2AE, UK, tel: +1 917 2397388, fax: +44 2079556803, e-mail: c.masseria@lse.ac.uk

Received 11 June 2009, accepted 15 February 2010

Background: Equitable access to health care is a core objective of the Italian health care system. Despite having achieved universal coverage for a fairly comprehensive set of health services for decades, there is still evidence of inequities systematically associated with income. **Method:** Income-related inequity indices were estimated for the probability of general practitioner (GP), specialist, inpatient care and also emergency care using a variety of need indicators. The data used were the Multiscopo survey, 2000 matched with the European Community Household Panel survey for Italy. The contribution of regional inequality was also estimated. Horizontal inequity indices for health care utilization measures were computed separately for people reporting hypertension, arthritis, tumour and heart disease. **Results:** Significant pro-rich income related inequity was found for GP, specialist and emergency care, no inequity was found for inpatient care. The disease approach showed statistically significant inequity in the probability of specialist care in three of the four chronic conditions analysed, and pro-poor inequity in GP care for all conditions. Inequity was mainly caused by income and regional variations. **Conclusions:** By reducing regional variation it would be possible to significantly reduce the pro-rich inequity in GP, specialist and emergency care. For specialist care inequity was found for the overall adult population and also among people with serious chronic conditions, and was caused not only by income and regional variation, but also by educational attainment and insurance.

Keywords: inequity, socioeconomic status, access to care, chronic conditions, Italy

Introduction

The achievement of equity in access to health care is a high priority in almost all developed countries and is considered integral to health system performance frameworks as developed by the Organization for Economic Cooperation and Development (OECD),¹ the World Health Organization (WHO),² and the European level strategies.³ In Italy, the achievement of equitable access to health care irrespective of individual ability to pay or other characteristics such as income and region of residence is a core objective of the National Health care system (SSN), as stated in Article 3 of the Italian Constitution. The SSN is mainly financed through general taxation, it is regionally and locally managed and it provides universal coverage for comprehensive and essential health services proved to be effective⁴. However, there is evidence that equity in access is rarely achieved.^{1,5–11} Cross-country comparative work using micro data from the 'European Households Panel Survey' (EHP)^{6,7,11–15} has shown that in Italy, as in most European countries, inequity in specialist and inpatient care favours the rich, while for general practitioner (GP) visits either there is no inequity or it favours lower income groups. Early studies on the assessment of the Italian SSN performance pointed out that inequalities in Italy existed in mortality, utilization and access to services.^{16,17} Cislaghi *et al.*¹⁸ and Costa *et al.*¹⁹ showed that in Italy the distribution of hospital, pharmaceutical and GP care was quite equitable across the country and in favour of the more disadvantaged socioeconomic groups, with only specialist care utilization in favour of the better-off.

The aim of this article is to verify whether the goal of equal access to specialists, GP, inpatient and emergency care for

equal needs has been achieved in Italy. This article differs from other national and international analysis of equity in access to health care because of the population analysed, the need definition used and the inclusion of regional information. Indeed, equity in access to health care was analysed not only for the whole adult population, but also for people reporting the most prevalent or most severe chronic conditions.

A disease-based approach to measuring inequity allows to remove some of the heterogeneity in health care needs, and to facilitate the development of a more targeted approach to equity policies.^{4,20} A broader definition of needs and not just self-reported health status is used. Moreover, due to the highly decentralized nature of health care in Italy, the contribution of regional variation to total inequity is also analysed using the decomposition approach.^{21,22}

Methods

The data used are the Multiscopo Survey 1999–2000, conducted by ISTAT (Italian National Institute of Statistics).²³ Every 5 years a representative panel of households and individuals are interviewed to have a picture of the health status of Italians.

Four different typologies of access to health care are analysed: specialist, GP, inpatient and emergency care. The reference period was the last 4 weeks for specialist and GP care, 3 months for inpatient care, and last year for emergency care. Multiple indicators of need were considered. Respondents rated their health status by choosing among five categories: 'very bad, bad, fair, good and very good'. Individuals were also asked to report whether they were severely or to some extent limited in their daily activity by

any physical or mental health problem, illness or disability. The type of chronic illness they suffered from was also reported, choosing among 28 different chronic diseases. Self-reported disability was also included, defined as the maximum level of non-transitory difficulties in at least one Activities of Daily Living.²³ Age and gender were included among need variables.

Among the socioeconomic variables education level and both individual and collective private insurance were considered. The net logarithm of imputed household income per equivalent adult was obtained using the OECD scale. Since in the Multiscopo Survey there is no information on income, this was imputed through a matching process using the ECHP 2000.²⁴ For the cell by cell imputation, seven categorical variables were selected in both surveys: age, gender, education, employment status, sector of employment, a second income source in the household, and area of residence (Supplementary Appendix 1). The sample analysed includes only adults aged over 16 years old, with a total number of 109 964 observations. Regional dummies were created for the overall adults' estimates; but, for the disease-specific estimates broad geographical areas were considered.

Mean values for all explanatory variables are reported in table 1.

Estimation methods

To achieve horizontal equity in health care, access should depend only on need, while socioeconomic factors unrelated to need should not influence utilization.²² Income-related equity in health care use was tested using the standardization by regression methodology.^{22,25,26}

The horizontal inequity index (HI) is by definition equal to the difference between income-related inequality in 'actual' health care use (C_m) and income-related inequality in 'need-expected' use (C_n). Whenever the better-off (worse-off) access care more than the worse-off (better-off), C_m is positive (negative). Whenever the need distribution favours the worse-off (better-off) the value of C_n is negative (positive). There is no inequity in access to care whenever C_m equals C_n or the difference is not statistically significant. A positive (negative) value of the inequity implies inequity favouring the better-off (worse-off). An intuitive interpretation of the HI results can be obtained by multiplying HI by 75;²⁷ for example a HI value of 0.1 implies that equity can be achieved by redistributing 7.5% (0.1×75) of health from the rich to the poor.

Estimates of health care needs for each health care service, necessary for calculating C_n , were obtained using logistic model where the dependent variable equals one if the individual utilized health care, or zero otherwise. The independent variables are differentiated between need and non-need variables. Non-need variables were held constant to their mean for obtaining the health care need estimates.

Separate health care models were also estimated for people reporting arthritis, hypertension, heart diseases and tumour.^{18,19,21,25}

The concentration index approach enables to decompose the contribution of need and non-need variables as well as of the error component to overall inequality in health care.^{21,22} However, if the demand for health care is modelled using non-linear estimation techniques, the decomposition method is not easily applicable.^{22,28} Therefore a sensitivity analysis was performed comparing linear and non-linear estimates of health care utilization. Since the linear results did not diverge from the non-linear results, the former coefficients were used for decomposing inequity and calculating the contribution of

each variable to total inequity. The contribution of each variable to total inequality is the product of three factors (divided by the mean value of the dependent variable): the relative weight of such variable (measured by its mean); its income distribution (Gini coefficient for income itself and the income concentration index for all the other variables) and the marginal effect on utilization of health care (linear regression coefficient, marginal effect). For example, if people with university education are richer than the rest of the population (positive income concentration index) and more likely to access care (positive marginal effect) their contribution to total inequality will be positive, on the contrary if they are less likely to access care (negative marginal effect) the contribution will be negative. The sum of the contribution of all the variables adds up to C_m , and the sum of the socioeconomic variables plus the error term equals to HI.^{23,26}

All results are weighted.

Results

Approximately 16% of the population reported a GP visit and 12% a specialist visit in the last four weeks. For inpatient care, 4% of the interviewees were admitted to hospital at least for one night in the 3 months before interview, and 5% used emergency care (12 months reference period) but only 10% of these patients were hospitalized.

GP care

The probability of visiting a GP was overall significantly associated with health care needs, chronic conditions played a significant role in explaining access to care (table 1 reports odds ratios for the logistic model).

Among the socioeconomic factors, less educated and richer individuals had a higher probability of visiting the GP. Regional differences in access to care were also observed.

GP utilization was found to be statistically in favour of the rich (table 1). Although the unstandardized concentration index was approximately zero and not statistically significant, needs were significantly more concentrated among the less advantaged groups than utilization (Supplementary Appendix 2).

The contribution of need (sum of all the need variables' contribution) to total inequality was negative and very significant. Inequity was mainly caused by regional variation and income (figure 1); while education contributed to reduce pro-rich inequity, being better-educated people richer and less likely to visit a GP than their counterparts (for each variable its income distribution and contribution are reported in Supplementary Appendix 2).

Specialist visits

All need variables, including chronic conditions played a significant role on explaining access to specialist care (table 1) with needs contributing to reduce inequalities by 23%. For achieving equal treatment for equal need, access should depend only on needs. However, net equivalent income had a positive and statistically significant coefficient in the specialist model. Moreover, individuals with a higher educational attainment and insurance were more likely to visit a specialist. Large heterogeneity across regions also emerged, with Southern regions less likely to visit a specialist than the rest of Italy.

The better-off had a significant higher probability of visiting a specialist before standardizing for population's needs. Moreover, since the incidence of self-reported ill health was significantly more concentrated among the worse-off

Table 1 Explanatory variables mean values, inequity indices and odds ratios for GP, specialist, inpatient and emergency care

	Mean	GP		Specialist		Inpatient		ER	
		Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
HI		0.02**	0.01	0.07**	0.01	0.00	0.01	0.04**	0.01
		O.R.	s.e.	O.R.	s.e.	O.R.	s.e.	O.R.	s.e.
Sah very bad	0.02	1.00	/	1.00	/	1.00	/	1.00	/
Sah bad	0.07	0.87*	0.07	1.20*	0.12	0.82**	0.08	0.84	0.09
Sah fair	0.36	0.62**	0.05	0.96	0.10	0.50**	0.05	0.67**	0.08
Sah good	0.43	0.40	0.03	0.65**	0.07	0.30**	0.04	0.44**	0.05
Sah very good	0.13	0.24**	0.02	0.48**	0.06	0.18**	0.03	0.31**	0.04
No health limit	0.77	1.00	/	1.00	/	1.00	/	1.00	/
Health limit a lot	0.07	1.35**	0.07	1.42**	0.09	2.80**	0.25	2.04**	0.17
Health limit some	0.16	1.42**	0.05	1.28**	0.05	1.99**	0.13	1.47**	0.08
Female	0.51	1.00	/	1.00	/	1.00	/	1.00	/
Male	0.49	0.90**	0.02	0.76**	0.02	0.97	0.05	1.34**	0.05
Age <29	0.21	0.71**	0.04	1.32**	0.07	1.25**	0.11	2.31**	0.18
Age 30–39	0.19	0.70*	0.03	1.25**	0.07	1.42**	0.12	2.09**	0.16
Age 40–49	0.17	0.69**	0.03	1.13**	0.06	0.98	0.08	1.57**	0.11
Age 50–59	0.15	0.77**	0.03	1.07	0.05	1.04	0.07	1.23**	0.08
Age >60	0.28	1.00	/	1.00	/	1.00	/	1.00	/
Number chronic	1.41	1.04	0.04	1.10**	0.05	0.93	0.06	1.09	0.07
No disability	0.95	1.00	/	1.00	/	1.00	/	1.00	/
Disability	0.05	1.06	0.06	0.92	0.06	1.16*	0.09	1.09	0.09
Lumbosacralgia	0.09	1.00	/	1.00	/	1.00	/	1.00	/
Cirrhosis	0.00	1.25**	0.08	1.14*	0.08	1.54**	0.16	1.10	0.11
Allergic	0.10	0.93	0.19	0.84	0.20	1.70**	0.45	1.23	0.37
Diabetes	0.04	1.11**	0.06	1.04	0.06	0.97	0.10	0.99	0.08
Cataract	0.04	1.21**	0.07	0.97	0.07	1.34**	0.14	1.17	0.12
Hypertension	0.14	0.90*	0.06	1.16*	0.09	1.28**	0.14	0.83*	0.09
Stroke	0.01	1.46**	0.07	0.86**	0.05	1.07	0.10	1.08	0.09
Venous diseases	0.08	1.08	0.11	0.91	0.11	1.86**	0.26	1.35**	0.18
Haemorrhoids	0.07	0.97	0.05	0.94	0.06	1.06	0.10	0.94	0.09
Bronchitis	0.05	1.08	0.06	1.00	0.07	1.34**	0.14	0.93	0.09
Asthma	0.03	1.16**	0.07	0.86**	0.06	1.17	0.12	1.12	0.11
Skin diseases	0.04	1.12*	0.08	0.89	0.07	1.22	0.15	1.03	0.12
Thyroid	0.03	1.17**	0.08	1.09	0.08	0.99	0.13	0.91	0.10
Arthritis	0.22	1.12	0.08	1.16**	0.09	1.09	0.13	0.86	0.10
Osteoporosis	0.06	1.21**	0.06	1.02	0.06	0.87	0.08	0.96	0.09
Hernia	0.02	0.94	0.06	0.83**	0.06	0.88	0.10	0.95	0.10
Ulcer	0.04	0.99	0.08	0.90	0.09	1.54**	0.19	0.96	0.12
Gallon stone	0.03	1.01	0.07	0.93	0.08	1.29**	0.15	1.16	0.13
Hepatitis	0.01	0.97	0.07	0.91	0.08	1.20	0.15	0.92	0.11
Renal stone	0.02	0.94	0.11	1.11	0.15	0.91	0.17	0.90	0.17
Prostate	0.02	1.12	0.09	1.11	0.10	1.64**	0.22	1.45**	0.17
Tumour	0.01	1.32**	0.11	1.25**	0.12	1.63**	0.21	1.17	0.14
Migraine	0.10	1.15	0.11	1.57**	0.17	2.61**	0.36	1.04	0.16
Parkinson	0.01	1.09	0.06	0.97	0.06	0.96	0.10	0.92	0.08
Nervous diseases	0.04	1.04	0.10	0.74**	0.09	0.99	0.15	0.96	0.14
Heart problems	0.06	1.02	0.06	1.08	0.08	0.96	0.11	0.92	0.09
Other disease	0.04	1.03	0.06	1.25**	0.09	1.71**	0.16	1.32**	0.12
Primary school	0.32	1.00	/	1.00	/	1.00	/	1.00	/
Secondary school	0.30	0.97	0.03	1.33**	0.05	0.98	0.06	0.99	0.06
High school	0.31	0.94*	0.03	1.59**	0.07	1.04	0.07	0.94	0.06
University	0.07	0.84**	0.05	1.76**	0.11	0.94	0.11	0.78**	0.08
No insurance	0.87	1.00	/	1.00	/	1.00	/	1.00	/
Insurance	0.13	1.03	0.04	1.41**	0.05	1.00	0.07	1.11*	0.06
Piemonte	0.08	0.96	0.06	0.95	0.07	0.86	0.11	1.05	0.11
Valle d'Aosta	0.00	0.74**	0.06	0.93	0.08	0.77	0.13	0.99	0.13
Lombardia	0.16	1.09	0.07	1.00	0.06	1.15	0.13	1.19*	0.11
Trentino	0.02	0.89*	0.06	1.19**	0.08	1.08	0.13	1.27**	0.13
Veneto	0.08	1.15**	0.07	1.03	0.07	1.05	0.12	1.22**	0.12
Friuli	0.02	1.11	0.07	1.10	0.08	1.04	0.13	1.05	0.11
Liguria	0.03	1.00	0.07	0.83**	0.06	1.07	0.13	1.01	0.10
Emilia	0.07	1.32**	0.09	1.14**	0.08	0.93	0.12	1.22**	0.12
Toscana	0.06	1.05	0.07	1.13*	0.08	0.94	0.11	1.20*	0.12
Lazio	0.09	1.00	/	1.00	/	1.00	/	1.00	/
Umbria	0.01	1.09	0.08	0.88*	0.07	0.96	0.13	1.12	0.12
Marche	0.03	0.97	0.07	0.99	0.07	0.95	0.12	1.10	0.11
Abruzzo	0.02	1.02	0.07	0.87**	0.06	1.35**	0.15	1.00	0.10
Molise	0.01	1.03	0.07	0.81**	0.06	1.10	0.14	0.81*	0.09
Campania	0.10	0.87**	0.06	0.79**	0.06	1.07	0.12	0.69**	0.07
Puglia	0.07	0.81**	0.05	0.80**	0.06	1.17	0.13	0.66**	0.07
Basilicata	0.01	0.94	0.07	0.88*	0.07	1.28**	0.16	0.67**	0.08
Calabria	0.03	1.16**	0.07	0.72**	0.05	0.98	0.11	0.79**	0.08
Sicilia	0.09	0.91	0.06	0.83**	0.06	1.09	0.13	0.90	0.09
Sardegna	0.03	0.88**	0.06	0.98	0.07	1.18	0.14	0.77*	0.08
Ln income	9.77	1.05**	0.02	1.07*	0.02	1.02	0.03	1.03	0.03

** $P < 0.05$; * $P < 0.10$.

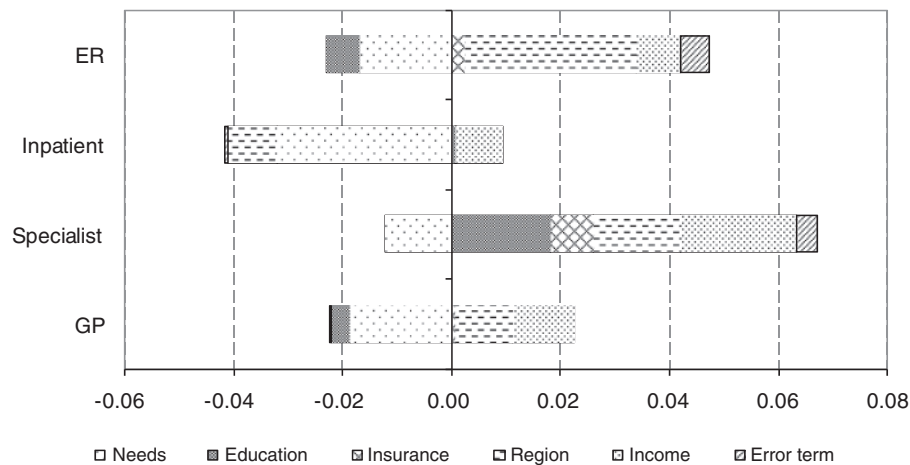


Figure 1 Decomposition of inequity in GP, specialist, inpatient and emergency care

(Supplementary Appendix 2), HI after standardization was even higher than before standardization (table 1).

Most of this pro-rich inequity was caused by educational gradient, geographical variation, insurance and income (figure 1). People with a higher level of education, with insurance, and living in Northern regions were not only richer, but are also more likely to access specialist care.

Inpatient care

Need variables were the main determinants of the probability of being admitted to a hospital.

For example people with cancer had an odds ratio of 2.6 and those with stroke of 1.9. Socioeconomic factors were not as significant as for GP or specialist care.

Access to hospital care was overall equitable, indeed although needs were more concentrated among the less advantaged groups, the poor were also significantly more likely to receive inpatient care than the better-off (Supplementary Appendix 2).

The decomposition approach was not very informative, since the socioeconomic variables included in the utilization model explained only a small degree of the variation in inpatient probability; 99% of total inequality was caused by the need distribution (need contribution/ C_m).

Emergency care

As for the previous health care services, need variables were significantly associated with the probability of utilizing emergency care, contributing to reduce approximately 57% of total inequality, but chronic diseases were not as significant as for the previous health care models.

However there was large heterogeneity in regional access, with people living in most Northern and Central regions more likely to attend emergency care than those living in Southern regions and Islands. Although the logarithm of income was not significant, a statistically significant inequity in favour of the better-off was found for total emergency care.

The decomposition approach showed that most of the inequality was explained by regional variation (116% of C_m), insurance (8%) and income itself (33%) (figure 1). Educational attainment had a negative contribution, being people with higher level of education less likely to attend emergency care.

Results by chronic diseases

Given the importance of chronic diseases in the probability of accessing all health care services analysed (table 1), the

estimation of the different HI indices (for the probability as well as the conditional number of GP and specialist visits, of hospital admissions, and emergency care utilization) were calculated for people affected by heart diseases, tumours, hypertension and arthritis. These are either among the most prevalent or most deadly diseases in Italy.^{23,29}

The probability of visiting a GP varied from 30% for people with arthritis to 35% for people with tumours and heart diseases. For specialist care, there was more heterogeneity, being as low as 14% for people with hypertension but as high as 24% for people with tumours. Regarding inpatient care, interviewees with either hypertension or arthritis were less likely to be admitted to hospital (probability respectively 7% and 6%) than those with heart diseases and tumours (respectively 13% and 19%). The probability of seeking emergency care varied from 7% for people with arthritis to 11% for tumours.

The need variables used for the disease-specific models were the same as in the total adult model without including chronic disease dummies. Figure 2 shows the HI indices for both the probability of using and the conditional use of health care for the four conditions analysed. The results show inequity in access to health care only for the probability of visiting a specialist for people with hypertension, arthritis, and tumour. For inpatient care inequity was found only for people with tumours, being significantly pro-poor for the probability of receiving care but significantly pro-rich for the number of times admitted hospital. Moreover, for the conditional number of visits there was a significant pro-poor inequity in GP care for all four conditions.

Discussion

Understanding income-related inequity in health care in Italy is not straightforward. The better-off are more likely to access specialist, GP and emergency care than the poor. The results for GP care is contradicting previous findings^{7,12,15} since in general the distribution of GP care was previously found to be either equally distributed or in favour of the poor. In comparison with previous articles, inpatient care was differentiated from emergency care, with interesting results. Emergency care was significantly distributed in favour of the rich, while no inequity was found in inpatient care. In previous studies, inpatient care in Europe was found to be either pro-poor or equitable,^{7,13,14} although by pooling the results for different years a pro-rich inequity in inpatient care was identified in Italy and other EU-15 countries.¹

The need vector used in the health care models includes not only age, gender, self-reported health status and limitation in

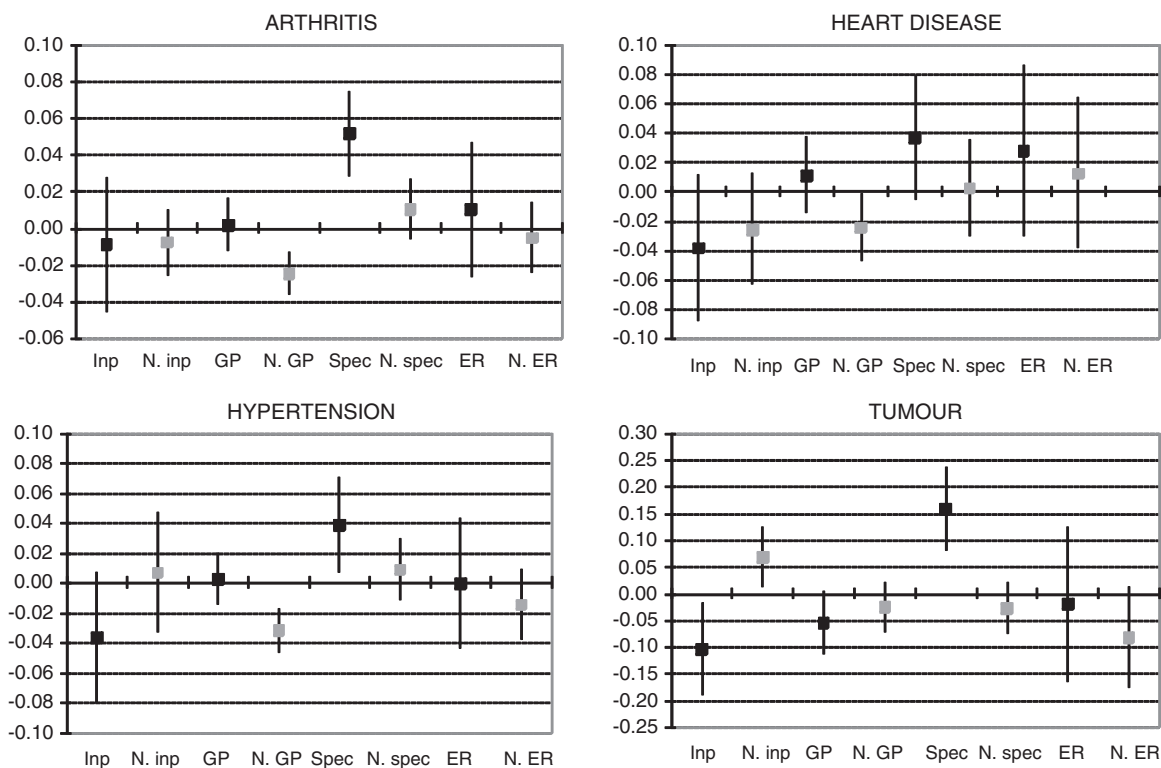


Figure 2 Income-related inequity in health care utilization for six chronic conditions. *Note:* The darker square represents the probability of accessing care and the lighter square represents the conditional number of accesses. $n = 6334$ heart diseases; $n = 1144$, tumour; $n = 5014$, for diabetes; $n = 15\,883$, hypertension; $n = 10\,826$, allergic diseases; $n = 25\,775$, arthritis

daily activity as in previous estimates, but also disability and the probability of reporting various chronic conditions. The average effect of this richer need vector is a reduction of HI for each health care service, ranging from 0.4% in inpatient care to 3% in specialist care.

Moreover, while previous studies^{30,31} were unable to fully investigate the role of regional variation in explaining overall inequity in health care use, given the decentralized nature of the Italian SSN the inclusion of regional dummies was essential to our study. As the decomposition results show, regional variation explained most of the pro-rich inequity in access to health care. For the probability of a GP visit, inequity was mainly caused by geographical variation and income itself; while education and need contributions were negative. For specialist care, income, education, insurance and regional variations were very important explaining respectively, 39, 33%, 14% and 29% of the total inequality. For inpatient care there was no inequity since access to care was mainly explained by needs distribution, with a negative contribution of income itself (26%) and a positive contribution of regional variation (29%). The contribution of geographical inequality was very large for emergency care, where it explained more than 100% of total inequality. Income and insurance also contributed to the pro-rich inequity in emergency care, while the contribution of education was negative. Some of these regional differences might partly be explained by variations in regional health care supply characteristics, such as doctor number, hospital beds, occupancy rates and ambulatory rates, usually distributed in favour of Northern and Central regions.²⁰ Cultural differences in access to care across regions might also play an important role, with emergency care being used as a substitute of specialist care in some regions, explaining in this way the significant regional contribution to the pro-rich inequity. A future analysis of private versus public access to care across regions might help explaining these inequalities.

Overall, more research into the role of regional variations might prove very interesting and essential to reduce inequity in access to health care in Italy. Moreover, it is interesting to notice how the contribution of income and education are opposite in case of GP and emergency care.

Furthermore, in comparison with previous studies that just looked at inequity in the aggregate health care use, this article analyses utilization of health care service also for people with the following chronic conditions: heart diseases, tumours, hypertension and arthritis which were either among the most prevalent or most deadly diseases in Italy (21). Individuals with tumour and heart problems made large use of specialist and inpatient care, with the latter using intensively also emergency care. On the contrary, people with hypertension were less likely to visit a specialist. Overall, the disease based estimates revealed no statistically significant inequity in the probability of visiting a GP but pro-rich inequity in the conditional number of visits for all four conditions. For specialist care, pro-rich inequity in the probability of seeking care was found both for disease categories that were intensive users of specialist care (e.g. cancer) and for those that rarely went to seek specialist consultations (e.g. hypertension). Inequity was particularly large for people with tumours. However, no inequity was found for the conditional number of specialist visits. For inpatient care, statistically significant inequity was found only for people with tumours; it was pro-poor for the probability of being hospitalized at least once, but pro-rich for the number of times people were hospitalized. No inequity was found for emergency care.

Our results rely on the validity of the matching procedure. Because income was not available in the Multiscopo survey, it was matched using the ECHP. Although the distributions of income by age, gender, activity status and education in the Multiscopo and ECHP surveys are very comparable (Supplementary Appendix 1), the matching procedure might

be the main limitation of our study. Moreover, our study was unable to evaluate the quality of the care provided.

To conclude, access to health care appears inequitable and in favour of the better-off in Italy with the exception of inpatient care. Inequity in specialist and GP care was detected also for people with arthritis, hypertension, heart diseases and tumour. For people with tumours, inequity was found in all forms of health care utilization but emergency care.

Inequity in GP, specialist and emergency care in the overall adult population was mainly explained by geographical inequities. Educational and insurance inequality also contributed to total inequity in health care use, although their role is less clear than that of region variation. Indeed the contribution of education might be positive (specialist care) or negative (GP and emergency care), and the insurance contribution although always positive was relatively small with the exception of specialist care. Income itself explained a large part of inequity in all health care services. Therefore by eliminating geographical inequities it might be possible to significantly reduce inequity in access to care in Italy. This might be achieved redistributing resources more equally across regions as well as understanding what is happening in regions with higher inequalities. Finally given our results a wider introduction of private insurance might increase inequities in access to care.

Supplementary data

Supplementary data are available at *EURPUB* online.

Funding

Part of this article draws on main results of the research project 'Analisi dell'equità nella distribuzione dello stato di salute della popolazione e nella distribuzione della spesa pubblica per servizi sanitari nella Regione dell'Umbria' financed by the Regional Health Authorities of Umbria Region to the Department of Economics Finance and Statistics, University of Perugia, Italy.²⁰ (Ricerca Finalizzata - Regione Umbria -Ass. Sanita e Servizi Sociali- Bando 2004-2005).

Acknowledgements

The authors are grateful to Sara Allin and Matteo Lippi Bruni for comments on previous draft. All errors are our responsibility.

Conflicts of interest: None declared.

Key points

- Income-related inequity indices for Italy were estimated not only for the probability of GP, specialist, inpatient care, but also emergency care using a variety of need indicators and not only self-assessed health status.
- Horizontal inequity indices for health care utilization measures were computed for the whole adult population, and also separately for people reporting the following chronic diseases—hypertension, arthritis, tumour and heart disease.
- Significant pro-rich income-related inequity was found for GP, specialist and emergency care, non-inequity was found for inpatient care.
- Inequity was mainly caused by income and regional variation, although for specialist care also educational and insurance differences contributed to the pro-rich inequity in access to care.

References

- 1 Hurst J, Jee-Hughes M. Performance measurement and performance management in OECD health systems. Paris: OECD, 2001.
- 2 WHO. The World Health Report 2000. *Health systems: improving performance*. Geneva: World Health Organization, 2000.
- 3 Atkinson A, Cantillon B, Marlier E, Nolan B, editors. *Social indicators: the EU and social inclusion*. Oxford: Oxford University Press, 2002.
- 4 Giannoni M. Universality and decentralisation: the evolution of Italian health care system. *Eurohealth* 2006;1210–3.
- 5 Commonwealth Fund. *A Report for Health Ministries of Australia, Canada, New Zealand, the United Kingdom, and the United States*, The Commonwealth Fund, Commonwealth Fund International Working Group on Quality Indicators, 2004.
- 6 van Doorslaer E, Koolman X, Jones A. Explaining income-related inequalities in doctor utilisation in Europe. *Health Econ* 2004;13:629–47.
- 7 van Doorslaer E, Masseria C. *The OECD Health equity Research Group Members. income-related inequality in the use of medical care in 21 OECD countries*. Paris: OECD, 2004.
- 8 Smith P. Progress in measuring health system performance: some international experiences, 2002a.
- 9 Smith P. Composite indicators of health system performance. In: OECD, editor. *Measuring up: improving health systems performance in OECD countries*. Paris: OECD, 2002b, 295–318.
- 10 van Doorslaer E, Masseria C, Koolman X. Inequalities in access to medical care by income in developed countries. *Can Med Assoc J* 2006;174:177–83.
- 11 van Doorslaer E, Koolman X, Puffer F. Equity in the use of physician visits in OECD countries: has equal treatment for equal need been achieved? In: OECD, editor. *Measuring up: improving health systems*. Paris: OECD, 2002.
- 12 Bago d'Uva T, Jones A, van Doorslaer E. Measurement of horizontal inequity in health care utilization using european panel data. Tinbergen Institute Discussion Paper TI 2007 - 059/3. *J Health Econ* 2009;28:280–9.
- 13 Masseria C, Koolman X, Van Doorslaer E. Income related inequality in the probability of a hospital admission in Europe. *Health Econ Pol Law*, 2010, under review.
- 14 Allin S, Masseria C, Mossialos E. Measuring socioeconomic differences in use of health care services by wealth versus by income. *Am J Public Health* 2009;99:1849–55.
- 15 van Doorslaer E, Masseria C, Koolman X. Inequalities in access to medical care by income in developed countries. *Can Med Assoc J* 2006;174:177–83.
- 16 Paci P, Wagstaff A. Equity in the finance and the delivery of health care in Italy. In: *Equity in the finance and delivery of health care: an international perspective*. Oxford: Oxford University Press, 1993a.
- 17 Paci P, Wagstaff A. Equity and efficiency in Italian health care. *Health Econ* 1993b;2:15–29.
- 18 Cislighi C, Zocchetti C. La Distribuzione per eta' dell'accesso alle Prestazioni Sanitarie. *Monitor* 2008;22:89–97.
- 19 Costa G, Landriscina T, Marinacci C, et al. Determinanti del fabbisogno di salute e di Assistenza. *Monitor* 2008;22:98–109.
- 20 Giannoni M, Rabito G, Masseria C. *Report: L'equità nell'accesso alle cure sanitarie: prime stime e confronti interregionali (equity in access to health care: first estimates for Italy with inter-regional comparisons)*. Perugia: Region of Umbria, Health care and Social Services Division, 2007.
- 21 Wagstaff A, van Doorslaer E, Watanabe N. On decomposing the causes of health sector inequalities with an application to malnutrition inequalities in Vietnam. *J Econ* 2003;112:207–23.
- 22 O'Donnell O, van Doorslaer E, Wagstaff A, Lindelow M. *Analyzing health equity using household survey data: a guide to techniques and their implementation*. Washington, DC: The World Bank, 2008.
- 23 Istat (Italian National Institute of Statistics). *Indagine Multiscopo sulle condizioni di salute e ricorso ai servizi sanitari. Anni 1999–2000*. Rome: ISTAT, 2003.

- 24 EUROSTAT. European Community Household Panel (ECHP). Luxembourg: European Commission, 2001.
- 25 Wagstaff A, van Doorslaer E. Equity in health care finance and delivery. In: Culyer AJ, Newhouse JP, editors. *Handbook of health economics*. Amsterdam: North-Holland, 2000, 1803–62.
- 26 Kakwani N, Wagstaff A, van Doorslaer E. Socioeconomic inequality in health: measurement, computation and statistical inference. *J Econ* 1997;77:87–104.
- 27 Van Doorslaer E, Jones AM. Income-related inequality in health and health care in the European Union. *Health Econ* 2004;13:605–8.
- 28 Jones A, Rice N, Bago d’Uva T, Balia S. *Applied health economics*. Abingdon: Routledge, 2007.
- 29 ISTAT (Italian National Institute of Statistics). *Health for all data*. Rome: ISTAT, 2008.
- 30 van Doorslaer E, Wagstaff A, Bleichrodt H, et al. Income-related inequalities in health: some international comparisons. *Health Econ* 1997;16:93–112.
- 31 van Doorslaer E, Wagstaff A, van der Burg H, et al. Equity in the delivery of health care in Europe and the US. *J Health Econ* 2000;19:553–83.