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"I PAY WITH MY FEET": THE HIDDEN POWER OF FREEDOM OF CHOICE IN REGULATED HEALTHCARE SYSTEMS

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Abstract

This paper proposes a relational perspective for analyzing patient mobility flows among Italian regions and exploring how regional resource endowment and its utilization explain mobility patterns. The data used refer to patient mobility for private medical services in the Italian NHS in the year 2014. We compute network centrality indicators to describe the tendency of certain regions to be recipients or senders in patient mobility

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patterns. A logistic regression quadratic assignment procedure is also used to study, at the dyadic level, the relation between regional structural characteristics and resource endowment and the probability of observing patient mobility flows across regions. Our findings document that differences in the level of resource endowments among pairs of regions are positively associated with the likelihood of observing patient mobility flows. Notably, we found that higher differences in the number of staffed physicians and in the productivity with which regions deliver medical services are positively associated with the probability of observing inter-regional patient mobility. Moreover, more productive regions are more likely to receive patients from other regions. Finally, our results show that patient mobility flows are less likely to occur across regions that are far apart. Overall, these findings provide important implications for policy makers.

Keywords: Patient mobility, Private medical services, Social network analysis, Italian NHS.

1. Introduction

Patient mobility is gaining momentum in modern healthcare policies and interventions because it is considered a signal of a lack of alignment between the needs of the population and resource allocation [1-2]. Such phenomena unveil some degree of social discomfort in public healthcare systems, hindering the legitimacy of the overall health policy. From an institutional standpoint, national healthcare systems are characterized by institutional pluralism (e.g. the presence of multiple entities: governmental bodies, regulatory agencies, providers) and governed by multiple logics, such as the free provision of service, the providers' administered competition, the co-payment of services, etc. At the national level, notwithstanding the designed and planned aims of a National Health System (NHS), patient mobility provides an actual picture of the responsiveness of the overall healthcare system. Such mobility acquires additional significance when patients have the freedom of choice of providers and spend their own money to access services away from their residency. Private medical services represent the common practice for physicians to work simultaneously in government hospitals and private facilities [3]. A number of studies have analyzed the regulatory framework (especially in the European Union; for a review, see Legido-Quigley et al. [4]) and the advantages/disadvantages of dual practice. On one side, physicians engaged in it are suspected of underrepresenting the interests of the public patient and/or payers, favoring long public waiting times to boost the demand for private services, "cream-skimming" profitable patients and using public resources for their private practice [5-6]. On the other side, dual practitioners are expected to have higher income and patient satisfaction, and hospitals may use dual practice as a tool for competing both in the labor market for health professionals and in order to attract more patients [3,7]. Despite such knowledge,

there is still a dearth of studies on how it affects patient mobility for private medical services.

In the present paper, we adopt a relational perspective to study patient mobility flows among regions in the Italian NHS. More specifically, we analyze how regional resource endowments and the efficiency of their utilization explain mobility patterns. By adopting social network analysis (SNA) tools, we compute network centrality indicators to describe the tendency of certain regions to be recipients or senders of patients. In addition, a logistic regression quadratic assignment procedure (LR-QAP) is used to study, at the dyadic level, the relation between regional structural characteristics and resource endowments and the probability of observing patient mobility flows for private medical services across regions.

1.1. CONTEXTUAL BACKGROUND

Patient mobility for private medical services concerns residents who have fully paid out-of-pocket for health services, which they could have obtained free of charge or at a lower cost from the National Health Service (NHS) [8]. This is a relevant issue in the Italian NHS. Previous research documents that 78% of Italian residents have fully paid out-of-pocket for at least one access to health services in their lives, and 45% for more than five accesses [8]. The Italian NHS adopts a decentralized quasi-market health care model in which "money follows patients", and the regions in which patients reside have to pay for treatments they decide to receive ("buy") from providers located in other regions. Since mobility concerns most health services, special inter-regional agreements regulate financial compensation.

Although scholars have started to investigate patient mobility across Italian regions [9-11], scant attention has been devoted to mobility for private medical services, where patients have to pay for their treatment out-

of-pocket, and the payer is not the NHS. The Italian NHS serves a population of approximatively 60 million and replicates the political division in the regions. Regional health systems are encompassed by large geographic, institutional and socio-economic differences, which may explain different patient mobility patterns [9]. The topic of patient mobility is *per se* highly relevant in terms of policy implications. Such relevance increases when mobility is associated with the existence of private practices that could complement or even replace the public services. The Italian "intramoenia" scheme for private medical services allows the operation of private practices by public employees within public facilities [7]. This scheme configures a situation in which the very same resources (personnel, facilities) are exposed to two operational and institutional logics: the public practice and the (voluntary) private practice.

The implications in terms of health policy are twofold. On the one hand, as will be explained later, the case is similar to other cases of NHSs exposed to institutional pluralism and complexity [12-14]. On the other hand, the existence of integrative medical practices, even without any form of mobility, might unveil some problems regarding the accessibility of care, allowing citizens who are able to pay out-of-pocket a swifter access to cures. This is even more evident in cases in which hospitals are not able to be timely in their response to care needs and operate with long waiting times. Our study shows that differences in the organizational and institutional settings at the regional level might explain patient flows for accessing private medical services in places that are different from their places of residence.

1.2. National health systems and institutional complexity

Like many other NHSs, the Italian NHS is characterized by a high degree of institutional complexity [12-17] due to, among other things, the pressure to provide universalistic care colliding with the exigency and the

opportunity to differentiate the levels of service (i.e., in terms of timely accessibility). As recently noted by Ocasio and Radoynovska [18], research on institutional pluralism and complexity provides scholars with the opportunity to investigate the sources of organizational heterogeneity, as well as to appraise how value is created and captured. In the field of the NHS, patient mobility can be seen as the destruction of social value (i.e. absences at work, including for accompanying persons) and the diversion of resources from the area of residency (i.e., travels, accommodation).

Within such a broader institutional framework, we decided to investigate how the existence of regulated private medical practices could have fostered inter-regional mobility. In doing so, we responded to the call issued by Kraatz and Block [19] to understand the micro-level mechanisms describing how individuals experience such institutional complexity. We do that via an analysis of patient flows and an attempt to better understand patient mobility patterns. Patient mobility provides evidence of the behaviors of the local populations within an institutional framework characterized by diverse institutional logics, e.g., public free care, private/out-of-pocket care, and co-payments. Furthermore, the presence of multiple regulatory entities, such as governmental bodies, normative agencies, and different kinds of providers explains the institutional pluralism of many NHSs [12-14]. Recent studies show how institutional pluralism might lead to heterogeneity, in terms of individual, organizational, or supra-organizational behaviors – such as patient mobility across regions –, rather than to the emergence of a homogeneous, convergent behavior, e.g., isomorphism [20]. In fact, the understanding of the magnitude and the direction of such patient flows provides a clearer picture of how public health resources are accessed and used by citizens. Furthermore, the display of how (regional) taxpayers decide to refer to health providers located in another region should inform the discourse on public resource allocation, which is currently very central within the EU and in most industrialized economies.

The study is based on social network analysis techniques and introduces a set of original variables to analyze patient mobility.

2. Materials and methods

we examine patient mobility for private medical services in the Italian NHS, a universalistic, publicly funded health system where health services are ensured to the whole population. In light of several reforms implemented during the 1990s, the organization of health services delivery has been progressively devolved to single regions [21], which currently are fully responsible for health care provision within their territories. Each Italian region has relevant prerogatives regarding decisions such as hospital closure or mergers, large-scale restructuring, and the adoption of new services and technologies in single, as well as multiple providers [22].

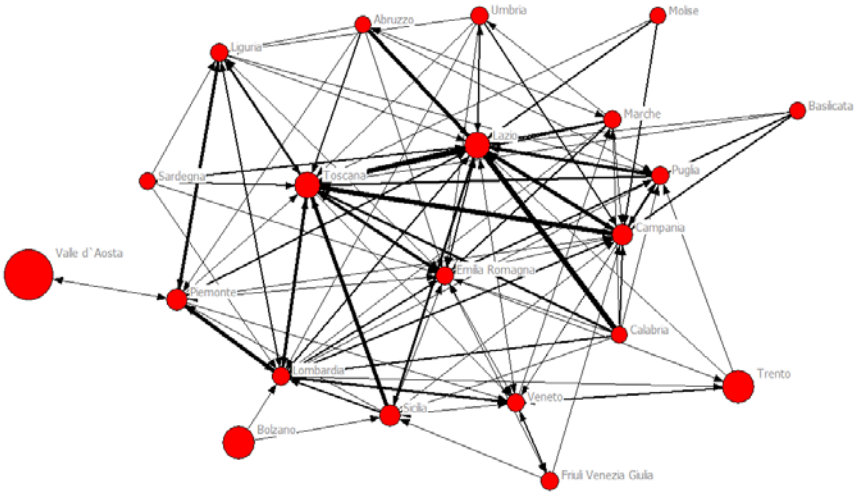
Private medical services represent a specific subcomponent of health care delivery in the Italian NHS, which has always given the opportunity to deliver private professional activities to hospitals' employed staff. Notably, private professional activities refer to "official arrangements that allow medical or related services to be provided, on a fee-for-service basis, to inpatients and outpatients in public facilities by full-time employees working outside their standard working hours" [7].

In the present study, we observe and study inter-regional patient mobility as a relational phenomenon where nodes, here represented by regions, are interconnected through a number of links, here expressed through patient mobility flows. Relational data are generically described as one-mode, square matrix [23], where rows and columns indicate nodes (regions) and intersection cells *xij* represent the number of patients flowing from region *i* to region *j*. Because we are interested in the act of patient mobility, rather than the number of patients flowing across regions, we dichotomize the square matrix so that the value of 1 is assigned to pairs of regions involved

in patient mobility, and 0 otherwise. The resulting matrix is asymmetric because patient flows can be observed from region *i* (sender) to region *j* (receiver), but this does not imply the reverse.

Figure 1 displays a sociogram of the patient flows network, obtained using the software Netdraw 2.1. [24].

Figure 1 – Inter-regional patient mobility sociogram



Note: Nodes indicate regions in the Italian NHS; ties indicate patient mobility flows for private medical services across regions. Dimension of nodes is proportional to the regional productivity in the delivery of private medical services (PALPI-AB). Dimension of ties is proportional to the number of patients flowing from one region to another. Node location in the graph is based upon its direct and indirect connectivity with other nodes in the overall network. For a better understanding, a map of Italy can be found here: https://commons.wikimedia.org/wiki/Atlas_of_Italy.

In general, social network analysis is used to study some relevant properties of nodes and relations observed in a given network. In the present study, we employ a number of network centrality indicators to explore the degree of connectivity that Italian regions exhibit in the overall network based on patient mobility flows. Centrality indicators are computed using the UCINET 6.512 software package [24].

A second type of analysis is performed to explore the relation between

regional structural characteristics and resource endowment and the probability of observing patient mobility flows across regions. For this purpose, we use the logistic regression quadratic assignment procedure (or simply LRQAP) [25-26] to test the association between a number of independent variables that capture regional structural characteristics and private medical service productivity and the dependent variable, here indicating whether or not two regions were involved in patient mobility flow. The LRQAP is a type of multiple regression quadratic assignment procedure (MRQAP) applied in the case of a binary dependent variable. Multiple regression quadratic assignment procedures (MRQAP) are permutation tests used to regress coefficients in a multiple linear regression model when the data are set in square matrices [26]. MRQAPs are widely used in social sciences and network studies, given their ability to overcome autocorrelation problems in dyadic/relational observations by means of non-parametric tests used to define whether the independent variables significantly predict the dependent variable [27].

In studies where statistical social network methodologies are used, independent variables are typically used to capture whether similarities or differences in some characteristics involving both actors in a dyad predict network connectivity. For example, in our case, certain similarities in regional characteristics, such as resource endowment and productivity, might influence the degree of patient mobility among the regions. Covariates are typically represented in the form of homophily effects ("similarity" for continuous variables and "matches" for binary/categorical variables) [28]. At the same time, it is possible to specify and include in the model specification "sender" and "receiver" effects, which enable an assessment of how a given node's characteristic affects its propensity to send ties (sender) and to receive ties from other nodes in the network (receiver). Overall, in our case, we are in the position to assess whether patient mobility flows are more likely to be observed from or towards certain regions encompassed

by some characteristics. Similarly, we can observe whether pairs of regions involved in patient mobility are "similar" (homophily) or different (heterophily) with regard to some regional characteristics.

We used a dataset provided by the Department of the Italian Ministry of Health that collates information on hospital activities and monitors inter-regional patient mobility for private medical services. The data obtained refer to the year 2014. In the present study, in light of our research objectives, we used the following variables:

Geographical Localization: This is a categorical variable that captures if the region is localized in Southern, Central or Northern Italy. The inspection of this variable is important to see whether regional differences (especially north-south diversities) observed in other health domains also apply in the context of patient mobility for private medical services.

Number of Physicians and *Number of Nurses*: These two variables indicate the total number of physicians and nurses employed in hospitals belonging to a given region, together capturing the capacity of regional health systems to supply health services to citizens. We are aware that other relevant resources (novel technologies, etc.) are equally important to the delivery of services. However, their use seems to be heavily linked to the availability of the main and the most important resources in health systems and organizations, notably the health workforce.

PO: This variable indicates the total number of medical services delivered by each region.

PALPI: This variable indicates the total number of private medical services provided by hospital organizations in each region.

PO-AB: This measure indicates the regional productivity in the delivery of health care services, computed as PO, divided by the total number of employed physicians and nurses.

PALPI-AB: This measure indicates the regional productivity in the delivery of private medical services, computed as PALPI, divided by the total number of staffed physicians and nurses.

Population: This indicates the number of residents over age 65, expressed as a percentage of the whole population, who reside in the region. Since this ratio is likely to be proportional to the prevalence of chronic diseases and the amount of resources absorbed, we included this variable to account for the complexity of clinical problems that health systems tackle at the regional level.

The variables *PO*, *PALPI*, *PO-AB* and *PALPI-AB* were created *ad hoc* for the present study as a combination of other available measures.

Table 1 summarizes the variables used in this study and provides some main descriptive statistics.

Table 1 - Descriptives

Variables	Location	N Physicians (A)	Physicians x 1,000 residents	N Nurses (B)	Nurses x 1,000 residents	PALPI	PALPI/A	PALPI/B	PALPI/ (A+B)	PO	PO/A	PO/B	PO/ (A+B)	Over65 patients ALPI
Min	1	258	145	513	323	0	0	0	0	1635	406	139	103	29
Max	4	14,335	212	40,720	521	1285	44	22	15	119414	1294	588	392	66
Sum	42	98,898	3,594	24,6691	8,978	5394	114	50	37	795208	16881	6858	4854	976
St.Dev.	1.024	3846.896	18.481	9934.528	55.294	343.289	9.46	4.634	3.176	34211.07	215.781	99.602	66.185	9.979

Region (original Italian name)	N. Physicians (A)	Physicians x 1.000 residents	N. Nurses (B)	Nurses x 1,000 residents	Tot. services Cod 5 e 6 (PALPI)	PALPI/A	PALPI/B	PALPI / (A+B)	PO	PO/A	PO/B	PO / (A+B)
Piemonte	7,495	1.70	18,913	4.30	578	0.077	0.031	0.022	70,598	9.42	3.73	2.67
Valle d`Aosta	258	2.05	513	4.07	114	0.442	0.222	0.148	1,635	6.34	3.19	2.12
Lombardia	14,335	1.49	40,720	4.22	497	0.035	0.012	0.009	119,414	8.33	2.93	2.17
P.A. Trento	757	1.47	2,336	4.55	3	0.004	0.001	0.001	9,798	12.94	4.19	3.17
Veneto	6,992	1.45	22,547	4.67	163	0.023	0.007	0.006	39,349	5.63	1.75	1.33

Friuli V.G.	2,169	1.77	6,371	5.21	92	0.042	0.014	0.011	13,235	6.10	2.08	1.55
Liguria	2,955	1.84	7,813	4.85	119	0.040	0.015	0.011	24,432	8.27	3.13	2.27
Emilia Romagna	6,820	1.60	19,959	4.67	237	0.035	0.012	0.009	27,675	4.06	1.39	1.03
Toscana	6,348	1.73	17,183	4.67	926	0.146	0.054	0.039	54,043	8.51	3.15	2.30
Umbria	1,516	1.71	3,723	4.21	27	0.018	0.007	0.005	10,570	6.97	2.84	2.02
Marche	2,517	1.62	6,822	4.39	55	0.022	0.008	0.006	25,478	10.12	3.73	2.73
Lazio	11,249	2.02	25,346	4.56	1285	0.114	0.051	0.035	86,010	7.65	3.39	2.35
Abruzzo	2,250	1.70	5,615	4.24	2	0.001	0.000	0.000	19,027	8.46	3.39	2.42
Campania	9,385	1.61	18,835	3.24	657	0.070	0.035	0.023	110,690	11.79	5.88	3.92
Puglia	6,288	1.54	13,436	3.30	233	0.037	0.017	0.012	71,251	11.33	5.30	3.61
Basilicata	960	1.62	2,460	4.16	3	0.003	0.001	0.001	6,810	7.09	2.77	1.99
Sicilia	8,589	1.71	16,251	3.23	403	0.047	0.025	0.016	48,467	5.64	2.98	1.95
P.A. Bolzano	783	1.59	2,327	4.71	-	-	-	-	6,494	8.29	2.79	2.09
Molise	681	2.12	1,550	4.83	-	-	-	-	5,599	8.22	3.61	2.51
Calabria	3,311	1.65	6,693	3.33	-	-	-	-	18,676	5.64	2.79	1.87
Sardegna	3,240	1.95	7,278	4.37	-	-	-	-	25,957	8.01	3.57	2.47
Italia	98,898	1.66	246,691	4.14	-	-	-	-	795,208			

3. Analysis and results

Table 2 reports for each region some of the main social network analysis indicators adopted in the social network analysis to capture the relevance that the nodes have, based on their connectivity, in the network [23]. Notably, we apply the following centrality indicators to capture the tendency of Italian regions to be involved in patient mobility flows: *InDegree*, *OutDegree* and *Betweenness*. In the case of a directed network (where ties have direction), *InDegree* is a count of the number of ties (patient flows) directed to a given node (region) and *OutDegree* is the number of ties (patient flows) that the node (region) directs to others. *Betweenness* centrality quantifies the number of times a node (region) acts as a bridge along the shortest path between two other nodes (regions).

Table 2 - Centrality Measures*

Region	OutDegree	InDegree	InDegree-OutDegree	Betweenness
Abruzzo	7	1	-6	0.93
Basilicata	4	0	-4	0
Bolzano (PA)	2	0	-2	0
Calabria	8	0	-8	0
Campania	6	12	6	15.26
Emilia Romagna	9	13	4	28.55
Friuli Venezia Giulia	3	2	-1	0.5
Lazio	8	17	9	45.12
Liguria	6	7	1	3.86
Lombardia	9	14	5	31.58
Marche	7	3	-4	21.46
Molise	3	0	-3	0
Piemonte	7	8	-1	35.12
Puglia	6	7	1	5.42
Sardegna	5	0	-5	0
Sicilia	7	5	-2	10.67
Toscana	6	15	9	12.46
Trento (PA)	3	2	-1	0.25
Umbria	6	2	-4	0.5
Valle d`Aosta	1	1	0	0
Veneto	6	10	4	48.33
Median	6	3	-1	3.86
Mean	5.67	5.67	0	12.38
Standard Deviation	2.24	5.74	4.74	16.13
Min	1	0	-8	0
Max	9	17	9	48.33

** Network centrality measures computed on dichotomized matrix.*

Table 2 clearly indicates that Italian regions are not homogeneously involved in patient flows for private medical mobility, and that some of them are encompassed by a relativity higher (lower) level of patient mobility flows. The Median and Standard Deviation values for the *OutDegree* and *InDegree* indicators are, respectively, 6 (SD 2.24) and 3 (5.74), underlying a higher homogeneous distribution of patient mobility for outgoing flows rather than incoming flows. Overall, the descriptive at the bottom of Table 2 indicates that all regions are, to some extent, characterized by outgoing flows of patients. Regions that exhibit the highest *OutDegree* are Emilia Romagna and Lombardia (*OutDegree* = 9), followed by Lazio and Calabria (*OutDegree* = 8), whereas the one that displays the lowest value is Valle D'Aosta (*OutDegree* = 1). The inspection of *InDegree* values reveals that the following regions are the most prominent, exhibiting a higher number of incoming patient mobility flows: Lazio (*InDegree* = 17), Toscana (*InDegree* = 15) and Lombardia (*InDegree* = 14). In contrast, Basilicata, Bolzano (PA), Calabria, Molise and Sardegna are all regions showing an *InDegree* value that equals 0, indicating the absence of incoming patients flows. The difference between *InDegree* and *OutDegree* can be of interest for policy makers to understand the regional propensity to receive (if *InDegree* > *OutDegree*) or send (if *InDegree* < *OutDegree*) patients. Table 2 suggests that, overall, in the I-NHS, such difference is positive for 9 regions and negative for 11 regions. In one region, namely Valle D'Aosta, such difference equals zero. Lazio and Toscana are the Italian regions that attract patients, net of outgoing patient flows towards other regions. In contrast, Calabria, Abruzzo and Sardegna exhibit the highest negative values, documenting the tendency of residents who demand private medical services to "escape" from these regions.

Finally, Table 2 reports the *Betweenness* centrality values for Italian regions. Even though our network is built solely based on direct patient flow mobility [29], overall, these figures allow us to capture those regions that

stand out because of their interposition on patient mobility network ties in the Italian NHS. These regions are, in particular, Veneto, Lazio, Piemonte and Lombardia.

Table 3 – LR-QAP results

Variable	Coefficient	Odds Ratio
Intercept	1.360 (1.106)	3.897
Geographical localization	1.506*** (4.268)	4.511
N Physicians (homophily)	-0.001** (-3.160)	0.999
N Nurses (homophily)	0.000** (3.977)	1.000
PALPI (homophily)	0.003** (4.851)	1.003
PO (homophily)	-0.000 (-0.201)	1.000
PALPI-AB (homophily)	-0.796*** (-5.390)	0.451
PALPI-AB (sender)	0.293 (2.619)	1.340
PALPI-AB (receiver)	0.728*** (5.945)	2.071
PO-AB (homophily)	0.000 (0.075)	1.000
PO-AB (sender)	0.003 (1.145)	1.003
PO-AB (receiver)	0.010 (3.023)	1.010
Population >65 (homophily)	-0.021 (-1.017)	0.979

Population >65 (sender)	-0.032 (-1.384)	0.968
Population >65 (receiver)	-0.109 (-3.355)	0.896
Regression diagnostics		
Log-likelihood	-169.977	
R-Sqr (Sig)	0.370 (0.001)	
# Obs	420	
# Permutations	5000	

Note: t-stats are reported in parentheses; Significance levels: *** $p < 0.01$; ** $p < 0.05$.

Table 3 reports our LR-QAP regression results aimed at exploring whether and how the probability of observing patient mobility flows across regions is related to differences in regional structural characteristics and resource endowment. In the model, the main independent variables that capture regional structural characteristics and resource endowment at a dyadic level are entered as homophily (heterophily), sender, and receiver effects. Our findings document that differences in the level of resource endowments among pairs of regions are positively associated with higher patient mobility flows. Notably, we find a negative and significant parameter (Odds Ratio = 0.451) of the variable *PALPI-AB(homophily)*, which captures the productivity in the delivery of private medical services, indicating that higher differences in the productivity with which regions deliver medical services are positively associated with patient mobility. Moreover, the positive and significant parameter (Odds Ratio = 2.071) for the variable *PALPI-AB(receiver)* indicates that more productive regions are more likely to attract patients from other regions. Our results also show a positive

and significant parameter for the variable *Geographical Localization* (Odds Ratio = 4.511), suggesting that patient mobility flows are less likely to be observed across regions that are far apart. Finally, we notice that other variables are significantly associated with the dependent variables, namely *N physicians(homophily)*, *N nurses(homophily)* and *PALPI(homophily)*, albeit displaying very low coefficients and odds ratios.

4. Discussion

The paper sheds light on how the individual spontaneous choices operated by citizens at a micro-level affect the overall functioning of a whole national health system (macro-level). In particular, the study unveils two critical aspects related to *how* and *where* Italian citizens decide to exercise their freedom to decide where to receive health services. The importance of such choices is emphasized by the fact that the co-payment logic and the additional resources spent by patients show an additional commitment to the mere discomfort of traveling to seek better care. Strategic organizational choices are shaped by available institutional logics. Considering the institutional structure of the Italian NHS as a field of investigation and the resource allocation as measured at the regional level, our evidence shows that institutional pluralism matches the heterogeneity in the way the regional health systems are governed [30-31]. This is a very original finding, since organizations (hospitals) operating within the same institutional settings are expected to react in a similar, isomorphic way to such pressures [20].

The institutional pluralism of the Italian NHS, and in particular, the autonomy that both the regions and the hospitals have in organizing their

own private medical services leads to a high heterogeneity of solutions. Such heterogeneity created the conditions that make some hospitals more attractive than others, with the magnitude of such attractiveness spanning beyond the regional boundaries, and consequently, triggering patient mobility. To this extent, the paper shows how an actual understanding of the patient flows could inform health policies that are able to mitigate the existence of contradictory logics (free provision vs. co-payment) within fields characterized by institutional complexity.

The study investigates a micro-phenomenon activated at the individual level: the decision to move out of the area of residency and receive care somewhere else. In that sense, the *ex ante* allocation of resources allows some regions to increase the magnitude of their attractiveness more than others. Such evidence could represent a useful input for the design of health policies related, for example, to the provision of incentives to reduce mobility. Furthermore, individuals consider only their private expenses, but they certainly do not assess the impact on the overall economic system in terms of diverted resources (i.e. absence from work). Our paper does not consider such an extension of the analysis. A wider investigation also comprising the broader social economic impact of such flows might be able to inform health policies in a more accurate way.

Additionally, the study might eventually inform the reorganization of some parts of the Italian NHS, based on the centrality of citizens' choices and their consequent mobility. To this extent, the research represents an example of "making do", as it enlightens the local conditions associated with better care (inter-regional mobility) at an affordable cost (as travel expenses are covered by the patients' families). The set of measures we set up for this study, in fact, provide a clear picture of the extant resource allocation, while the patient flows express the actual performative dimension of such a structural distribution.

The study unveils how the actual functioning of a whole NHS might be shaped by the "shadowed power" of its users/citizens. In fact, the exercise of such a power of choice matches the opportunity for Italian public hospitals to activate the private medical activities operated by their internally employed human resources. The attractiveness of such human capital, combined with the availability of technology and other infrastructural features, shapes the actual allocation of private (out-of-pocket) and public (regional investments, interregional financial transfers) resources. The institutional setting of such complementary, integrative, private medical activities is defined at the national level, but it is actually regulated and implemented at the regional level via a system of incentives and moral suasion (i.e. public hospitals' top management is appointed by the regions).

The results of our study describe large differences between the regions in terms of responsiveness to local needs. That could open routes for development at different levels, according to different logics. If the dominant logic is one of granting homogeneity of service at the national level even for private practices, then the national policies should pay more attention to resource allocation, in order to give the less developed regions the means to catch up with the standards of the others. If the dominant logic is instead one of aiming at the general improvement of the NHS via competition among regions, integrative medical practice could grant the most attentive regions a comparative advantage if the regional policies and their regulations should encourage the local hospitals to develop organizational solutions for the synergic development of private activities.

Our findings should be interpreted in light of a number of limitations. First, the generalizability of the findings outside the Italian NHS is limited, as its peculiar mechanisms for resource allocation are highly idiosyncratic. For example, experiments in the Netherlands clearly demonstrate that few patients are willing to travel in border regions and seem to prefer longer waiting times in the regions in which they live [32]. Second,

further studies will be needed that incorporate various characteristics and patient-level data (socioeconomic status, level of education, etc.) to better understand how other factors may influence their choice model [33]. Third, our study is cross-sectional and does not take into account how patient mobility flows evolve over time. Although the analysis of patient mobility dynamics goes beyond the scope of the present research, future studies should better evaluate how health policies and interventions affect the evolution of patient mobility.

With the limitation just acknowledged in mind, we trust that the results of our study can shed light on similar phenomena in other health systems characterized by a similar level of institutional complexity [34]. Furthermore, we trust that the set of variables we originally created and measured can inform other studies aimed at comparing how organized systems "perform" in terms of attractiveness.

5. Conclusion

A first contribution made by this study is in the provision of a preliminary evaluation of the antecedents of patient mobility for private medical services, which clearly highlights a misalignment between the needs of the population and resource allocation. By doing so, we add to the extant patient mobility research, which has been mostly focused on the analysis of waiting times and quality differentials among regional providers. This issue is very relevant in public healthcare systems and even more so for the Italian NHS, because it reveals the differences in the equity of access to care of patients living in different regions and the relative amount of the economic resources that move from one region to another.

A second contribution made by this study addresses the debate regarding the factors that influence the propensity of patients to move to other regions. Unveiling how and where Italian citizens move to access health services is a useful input for the design of health policies related, for example, to the provision of incentives for reducing mobility or to regulate and incentivize private medical activities within regional public hospitals.

Finally, this study provides new insights by addressing the application of network analytic techniques in order to increase the understanding of patient flows across regions and inform policy makers about where and how to invest resources and improve the efficiency and the quality of the care provided by the health system. Network analysis can yield novel information and support policy makers in the formation of structured agreements to regulate patient flows between regions.

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