Fairness in healthcare finance and delivery: what about Tunisia?

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Anecdotal evidence on hidden inequity in health care in North African countries abounds. Yet firm empirical evidence has been harder to come by. This article fills the gap. It presents the first analysis of equity in the healthcare system using the particular case of Tunisia. Analyses are based on an unusually rich source of data taken from the Tunisian HealthCare Utilization and Morbidity Survey. Payments for health care are derived from the total amount of healthcare spending which was incurred by households over the last year. Utilization of health care is measured by the number of physical units of two types of services: outpatient and inpatient. The measurement of need for health care is apprehended through a rich set of ill-health indicators and demographics. Findings are presented and compared at both the aggregate level, using the general summary index approach, and the disaggregate level, using the distribution-free stochastic dominance approach. The overall picture is that direct out-of-pocket payments, which constitute a sizeable share in the current financing mix, emerge to be a progressive means of financing health care overall. Interestingly, however, when statistical testing is applied at the disaggregate level progressivity is retained over the top half of the distribution. Further analyses of the distributions of need for—and utilization of—two types of health care—outpatient and inpatient—reveal that the observed progressivity is rather an outcome of the heavy use, but not need, for health care at the higher income levels. Several policy relevant factors are discussed, and some recommendations are advanced for future reforms of the health care in Tunisia.

Keywords	Healthcare finance, healthcare delivery, progressivity, horizontal equity, Tunisia

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KEY MESSAGES

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- Findings are presented and compared at both the aggregate level, using the general summary index approach, and the disaggregate level, using the stochastic dominance approach.

- The overall picture is that direct out-of-pocket payments, which constitute a sizeable share in the current financing mix, emerge progressive overall. However, when statistical testing is applied at the disaggregate level progressivity is retained over the top half of the distribution. Further analyses of the distributions of need for—and utilization of—two types of health care—outpatient and inpatient—reveal that the observed progressivity is rather an outcome of the heavy use, but not need, for health care at the higher income levels.

Introduction

'Fairness in healthcare finance' has often been placed within a more general framework for evaluating the performance of the healthcare system, e.g. the Word Health Organisation (WHO) Framework for Health System Performance Assessment (WHO 2000); and for promoting equity in health, e.g. the International Human Rights Framework of the WHO Commission on Social Determinants in Health (Schrecker et al. 2010). Accordingly, fairness in payment for health care involves acknowledging that these payments ought to be appropriately linked to individuals' abilities-to-pay (ATP) rather than their needs or benefits. The strong emphasis on fairness in individuals' financial contributions seems, however, to reflect diverse concerns about the degree of inequality in the distribution of one or another variable. In effect, one primary concern relates to the 'impoverishing effect' that these payments can have on households' income sufficiency (Xu et al. 2007; Abu-Zaineh et al. 2013). An important concern is also derived from the potential 'dis-equalising effect' of these payments on the income inequality (O'Donnell et al. 2008a). Indeed, the latter was shown (Wagstaff 2002) to be an issue of fundamental rather than instrumental interest to equity issues involved in healthcare finance. Yet another prime concern relates to the 'deterrent effects' that these payments can have on the distribution of healthcare utilization (Roy and Howard 2007). This concern stems from a more fundamental concern about the 'distribution of health' per se (Culyer 1993).

Empirically, conclusions about fairness in healthcare payments are typically inferred using the aggregate summary index approach; e.g. 'Kakwani index of progressivity' (Kakwani 1977)—where progressivity of payments (with respect to ATP) is summarized over the entire distribution of the population and generally taken to indicate 'vertical equity'. This approach has widely been applied in the context of high-income countries (Wagstaff et al. 1992, 1999), and more recently, in the low- and middle-income countries (e.g. Cissé et al. 2007; Abu-Zaineh et al. 2008; O'Donnell et al. 2008a) to assess the extent to which health systems have achieved fairness in health finance. It has proven to be useful in providing clear policy recommendations for health sector reforms in the context of developed countries (Wagstaff and van Doorslaer 2000a). However, recent reviews (Abu-Zaineh 2009; Van Doorslaer and O'Donnell 2010) suggested that it is more difficult to infer equity features of the health financing in developing countries through relying the analysis of fairness solely on single-valued summary measures of progressivity. This is mainly the case where payments for health care remain, to a large extent, linked to the direct utilization of healthcare services. Consequently, the heavy financial burden that these payments can impose, particularly, on the lowest-income groups may lead them to use 'disproportionately less' health care despite their greater need, and hence, the 'deterrent effect' would probably be greater for the poor than for the rich (Abu-Zaineh et al. 2011). The distribution of healthcare payments can, thus, be 'progressive', on average, but such result may only reflect profound inequalities in the distribution of healthcare utilization. Under these conditions, the assessment of fairness in healthcare finance should examine the distribution of healthcare payments and utilization simultaneously (O'Donnell et al. 2008a).

Simultaneous quantification of fairness in payment for, and utilization of, health care is of interest not only from a wide range of equity perspectives but also for macroeconomic and political analyses of the healthcare systems (O'Donnell et al. 2008b). In effect, combined with sustained economic, social and human development, a progressive expansion of social protection mechanisms in health has been recommended as a key strategy to promote equity in health (WHO 2008). In recent years, state initiatives have been undertaken to expand the breadth of coverage with respect to population and services in many developing countries (Gottret et al. 2008). Previous evidence demonstrates how the reliance on direct payments for health care can decline with the increase in the level of country's health coverage (Yazbeck 2009).

This study seeks to shed light on the above issues while presenting a simultaneous evaluation of fairness in healthcare spending and utilization in the particular context of Tunisia—one of the North African countries in political and epidemiological transition. This is not an uninteresting case study. Several key changes with possible distributional implications on health occurred in Tunisia during the last two decades making the study of equity and the period chosen additionally interesting. First, user fees in the public sector were introduced and rose. The increase was especially pronounced for inpatient care services, where fees appear to have risen by more than 80% in real terms between 1995 and 2005, but was also noticeable in primary centres even though these were still supposed to be provided for modest user charges (WHO 2006). Second, although public investment in health continued to increase in nominal terms, a shift in the structure of healthcare financing from public to private sources was evident with the implementation of structural adjustment programmes in the 1990s. As a result, the share of households' direct payments increased steadily from 36.6% in 1996 to 51.3% in 2008, while at the same time the share of public funding declined substantially from 63 to 49% (Arfa and Achouri 2008). Third, the public health insurance system has rapidly expanded its breadth of coverage—as reflected by the policy statements and official statistics released by government agencies (Ministry of Public Health 2009)—indicating that Tunisia has almost achieved close to universal coverage (Arfa and Achouri 2008). However, some representative national surveys suggest that, in practice, a significant portion of the population remains without any healthcare coverage (National Institute of Public Health 2008).

In addition, significant increases in direct health expenditures have been concomitantly observed. This has been partly due to cost-sharing tariffs that exist even under state-subsidized schemes, and the shift away from public to private sector, which has flourished rapidly since the beginning of the 1990s (Arfa and Achouri 2008).

Recent anecdotal evidence on social determinants of health in North African countries (Ben Romdhane and Grenier 2009; Boutayeb and Helmert 2011) has already pointed out the persistence of hidden socio-economic-related inequalities in child and maternal health. Yet, firm empirical evidence on the various equity features of the Tunisian healthcare system has been harder to come by. This study attempts to fill the gap by using an unusually rich source data taken from the Tunisian HealthCare Utilization and Morbidity Survey (THCUMS 2006). The THCUMS gave us the opportunity to apply standard assessment measures of equity in healthcare financing and to compare the equity measures for the financing aspect of health care to similar measures dealing with healthcare utilization. The remit of the article is organized as follows. The following section outlines the methodology. This is followed by the dataset and the variables' definitions. The penultimate section discusses the results, and the last section concludes with policy recommendations.

Methods

The conventional method commonly applied in the health equity literature is based on the single-valued summary measures of inequality such as the Concentration index (CI) (Klavus 2001). The value of the CI involves summarizing—over the entire population—the magnitude and direction of income-related inequality in the distribution of health variables of interest (e.g. payment, utilization and ill health), but it does not necessarily imply (in-)equity in the respective distribution (O'Donnell *et al.* 2008b). Answers to the specific equity questions of whether and to what extent the distribution of healthcare payments ('utilization') is commensurate with individuals' ATP ('need') can be obtained using two distinct measures—related, respectively, to the notions of vertical and horizontal equity. The 'Kakwani Progressivity Index', KIP, which involves comparing the CI of payments for health care, C_{exp}, with the Gini index of inequality in ATP, G_X, indicates with a positive (negative) value whether the payment scheme is progressive (regressive) overall. Equity in healthcare utilization is tackled using the 'Index of Horizontal Inequity'—proposed by Wagstaff and Van Doorslaer (2000b), HI_{WV}. This involves comparing the CI of the actual (observed) distribution of healthcare use, C_{use}, with the CI of need (or ill health), C_{ill}. A positive (negative) value of the HI_{WV} indicates horizontal inequity favouring the better-off (worse-off).

Single-valued measures of vertical and horizontal inequities provide a useful though incomplete picture of prevailing inequalities across the different socio-economic groups of the population (Klavus 2001; Abu-Zaineh *et al.* 2008). A fuller picture of existing inequalities can be obtained using the stochastic dominance approach, which allows scrutiny of inequalities at all possible points of comparisons, and thus, provides more robust conclusions in the policy sense. Therefore, in this study, we employ the above indices, but we depart in our empirical analysis from the popular approach by further applying the asymptotically distribution-free statistical procedure (Bishop *et al.* 1994; Klavus 2001). This allows a more refined examination of whether or not the observed differences between two distributions are statistically significant at two levels of analysis: the disaggregate level for differences in the individual ordinates at a given percentile point, and the aggregate level; e.g. dominance of the entire concentration curve of payments, $C_{exp}(p)$, over the Lorenz curve of ATP, $L_X(p)$. At the individual ordinate level, i, this is accomplished by testing each of the statistics Z_i—where $Z_i = (\hat{D}_i)/(\hat{v}_{ii}/N)^{1/2}$, with $\hat{D}_i = \hat{\theta}_i^A - \hat{\theta}_i^B$ being the estimated difference statistics between two curves (A and B) evaluated over the ith percentile ($i = 1, 2, \ldots, k$)—as a Studentized Maximum Modulus (SSM). To determine if, and where, the ordinates differ, a pair-wise ordinate test is conducted for the k sub-hypothesis: $H_{0,i}: \hat{\theta}_i^A = \hat{\theta}_i^B$ vs $H_1: \hat{\theta}_i^A \neq \hat{\theta}_i^B$. Testing for the dominance of the entire curve involves comparing simultaneously the largest positive and negative values of the 'Z-statistics' [$Z+$, $Z-$] with the critical value from the SMM distribution. The overall null of non-dominance ($H_0: A = B$) is rejected in favour of As dominance (Bs dominance) if solely $Z+$ ($Z-$) is significant, and in favour of crossing if $Z+$, $Z-$ are simultaneously significant. The 5% level of significance is used with $k = 9$.

Dataset and variable definitions

The THCUMS is a two-stage stratified cluster-random sample of 6538 households (35 929 individuals). The response rate for the household interviews was 88.7%. The data have been weighted to compensate for non-response and to recover the population profile (as per the Population Census of 2004). In addition to demographic and socio-economic characteristics, the dataset included detailed information on households' health expenditures, utilization and morbidity. Payments for health care were derived from a question on total amount of healthcare spending that was incurred by household members over the last year. Total consumption expenditures were used as a proxy for ATP. Both ATP and payments for health care were equivalized to generate an average expenditure per equivalent adult, using the equivalence scale proposed by the WHO/FAO (Food and Agriculture Organization of the United Nations) (Deaton and Grosh 2000). Utilization of health care was measured by the number of physical units of two types of services: outpatient visits and inpatient-hospital admissions. The recall period was 3 months for outpatient and 12 months for inpatient.

To investigate equity on the delivery side of the healthcare system, reliable empirical proxies of 'need' are required. In our analysis, 'need' is approximated using a rich set of data on various ill-health indicators. These were gathered in our survey using three different modalities. The first is subjective and defines health in terms of an individual's perception using the typical self-assessed health (SAH) question on a five-point scale running from 'very good' to 'very bad' via 'fair'. Those answering 'fair' to 'very bad', are classified as self-rated illness (SRI). The second is functional indicating whether an individual suffers from any limitations/impairments in ten domains (e.g. mobility, pain and discomfort, etc.). These limitations, recorded on a three-point scale ranging from 'no difficulty' to

'extreme difficulty' via 'moderate', allow construction of a functional measure of limiting illness/impairment (FLI). Those reporting 'I cannot do it' or 'have great difficulties' to at least 1 of the 10 items are classified as chronic impaired. The last modality is medical, defining ill health as a deviation from some physiological norm. Accordingly, individuals were asked to indicate whether they had ever been diagnosed with a chronic physical or mental health problem, whether they had ever received or is currently on treatment for these conditions, and a series of detecting questions for each condition. The detection of conditions from these questions allows eight chronic diseases to be defined and included separately in our analysis. However, for the sake of parsimony, these are combined in the physician-diagnosed illness (PDI) indicating whether a respondent has at least one diagnosed chronic disease.

While the notion of 'need' is more complex than can be captured through these self-reported simple measures, there is evidence (Idler and Benyamini 1997) that such measures are rather good predictors of other outcomes such as mortality and of the subsequent use of health care. However, given previous evidence (e.g. Suárez-Berenguela 2001; Abdulrahim and Asmar 2012) on the sensitivity of inequity measures to the chosen indicator of need, we, first, investigate and present results for each of the three 'ill-health' indicators separately. This helps test whether each measure has a different relationship vis-à-vis the income distribution. All measures of need are, then, incorporated, simultaneously, along with demographics (four age and gender groups), to derive a standardized 'need-predicted' distribution. Standardization is carried out using the non-linear indirect approximation (O'Donnell et al. 2008b). Accordingly, 'need-predicted' values are computed, assuming the sample means of the non-confounding variables, as the product of two-part specifications (probit and negbin). The non-confounding variables consist of a number of non-need indicators (e.g. education, occupational and marital status; insurance), which were shown (van Doorslaer et al. 2004) to affect utilization patterns. Finally, indices were computed using the convenient (weighted) covariance methods as documented in Lerman and Yitzhaki (1989) and O'Donnell et al. (2008b).

Results

Distribution of healthcare payments

Results concerning progressivity analysis at the decile ordinates are shown in Table 1 along with the corresponding standard errors and the individual 'Z-statistics' indicating whether the estimates are statistically significantly different from zero (at 95% level). Comparisons of the distribution of equivalent expenditures across deciles give an idea about the degree of prevailing income inequality: the shares of total equivalent consumption expenditures going to the top two deciles are significantly higher than their population shares of 10% (19.40, 30.40%, respectively), whereas the bottom four deciles receive, on average, <5% of total consumption, clearly indicating a quite high degree of income inequality in Tunisia. When the population is taken as a whole, out-of-pocket expenditures on health care appear to absorb, on average, ~10% of the total household expenditures. The distribution of healthcare

payments across deciles shows, however, quite substantial differences in the amount of healthcare expenditures borne by each decile. Out-of-pocket payments appear to be borne mostly by the richest, as the bottom five deciles bore, on average, between 1.07 and 4.62% of total health expenditure, whereas the shares borne by the top three deciles amount to 15.18, 21.01 and 33.14%, respectively. Comparisons with the distribution of total expenditures show that the shares of direct payments borne by richest deciles are always higher than their shares of gross expenditures, while the reverse is always true for the less wealthy half of the population.

Results concerning the test statistics of the differences between the individual ordinates of the Lorenz curve of ATP, $L_X(p)$, and the concentration curve of healthcare payments, $C_{exp}(p)$, as well as the test on the dominance of the entire curve are shown in the last column of Table 1. Progressivity of healthcare payments is statistically supported for all deciles except the four lowest deciles, where the individual 'Z-statistics' fall short of the SMM critical value (Z^*) at the 95% level. Test on the dominance of the entire curve indicates, however, that out-of-pocket payments are progressive overall: the largest positive value corresponding to the simultaneous test statistics, $Z+$, $Z-$, exceeds the critical value Z^* of the SMM at the 95% level. This is also confirmed by the estimates of the aggregate summary measures of concentration and progressivity: both are positive and statistically significant at the 95% level.

Distribution of need for and use of health care

Before assessing equity in healthcare utilization, it is useful to look, first, at the prevailing inequalities in the unstandardized distributions of ill-health status (across deciles) as per the three modalities used, and next, to proxy 'need': the subjective SRI, the FLI and the PDI. Figure 1 consistently indicates that all three measures of morbidity are concentrated among those in the lowest decile (all the concentration curves, C_{ill} lying above the equality line). However, the extent of concentration in each varies: the SRH measure is least concentrated among the poor with around 17% of ill health being among the poorest decile, followed by the functional measure where this group has over 22% of illness. The measure of PDI is the most unequally distributed across deciles with around a quarter of all chronic illness being among the lowest 10% of the income distribution compared with only 4% among the richest 10%.

Figure 1 also presents the distributions of the two types of health service analysed, outpatient and inpatient (C_{use}). Accordingly, a different picture emerges, one in which only the concentration curve for outpatient care lies everywhere above the equality line, exhibiting a 'pro-poor' trend, though not sufficiently so to meet the very pro-poor distributions of ill-health. A notable exception is the upper part of the distribution of SRI where the two curves cross at the sixth decile. Also shown in Figure 1 is the health expenditure concentration curve (C_{exp}), which appears to lie everywhere below all the illness curves and also below those of actual care use. This indicates that the share of resources received by the worse-off is less than both their shares of sickness and utilization. Moreover, the expenditure curve being more concentrated among the better-off compared with those of utilization, particularly the 'pro-rich' inpatient, may indicate that the

Table 1 Distribution of equivalent household expenditure and healthcare payments at decile ordinates[a,b]

	Share of equivalent gross expenditure	Share of healthcare payment	Cum. share of equivalent gross expenditure [$L_{X(p)}$]	Cum. share of healthcare payment [$C_{exp(p)}$]	Differences [$L_{X(p)} - C_{exp(p)}$]		Z-statistics
Decile							
1st decile	1.67	1.07	1.67	1.07	0.60	(0.0011)	0.49
2nd	3.13	1.12	4.80	2.19	2.61	(0.0013)	1.81
3rd	4.21	3.34	9.01	5.53	3.48	(0.0016)	1.61
4th	4.41	3.34	13.42	8.87	4.55	(0.0021)	1.76
5th	5.82	4.62	19.24	13.49	5.75	(0.0071)	3.31**
6th	7.63	6.35	26.87	19.84	7.03	(0.0082)	5.68**
7th	8.23	10.83	35.10	30.67	4.43	(0.0107)	4.18**
8th	15.11	15.18	50.21	45.85	4.36	(0.0131)	3.61**
9th	19.40	21.01	69.61	66.86	2.75	(0.0213)	2.94**
10th decile	30.39	33.14	100.00	100.00	–		(0.0259)
Dominance test							
Z+							**6.68**
Z−							**0.00**
Gini/CI/KPI			**0.4421 (0.0407)**	**0.5782 (0.0515)**	**0.1361**		

[a]Standard errors in parenthesis.

[b]Significant progressivity/regressivity overall, where the critical value Z* of the SSM ($\alpha = 0.05$, $k = 9$) is 2.77.

**Significant difference between the estimated individual ordinates at 0.05, where the critical value Z* of the SSM is 1.96.

Bold values indicate significance at 5%.
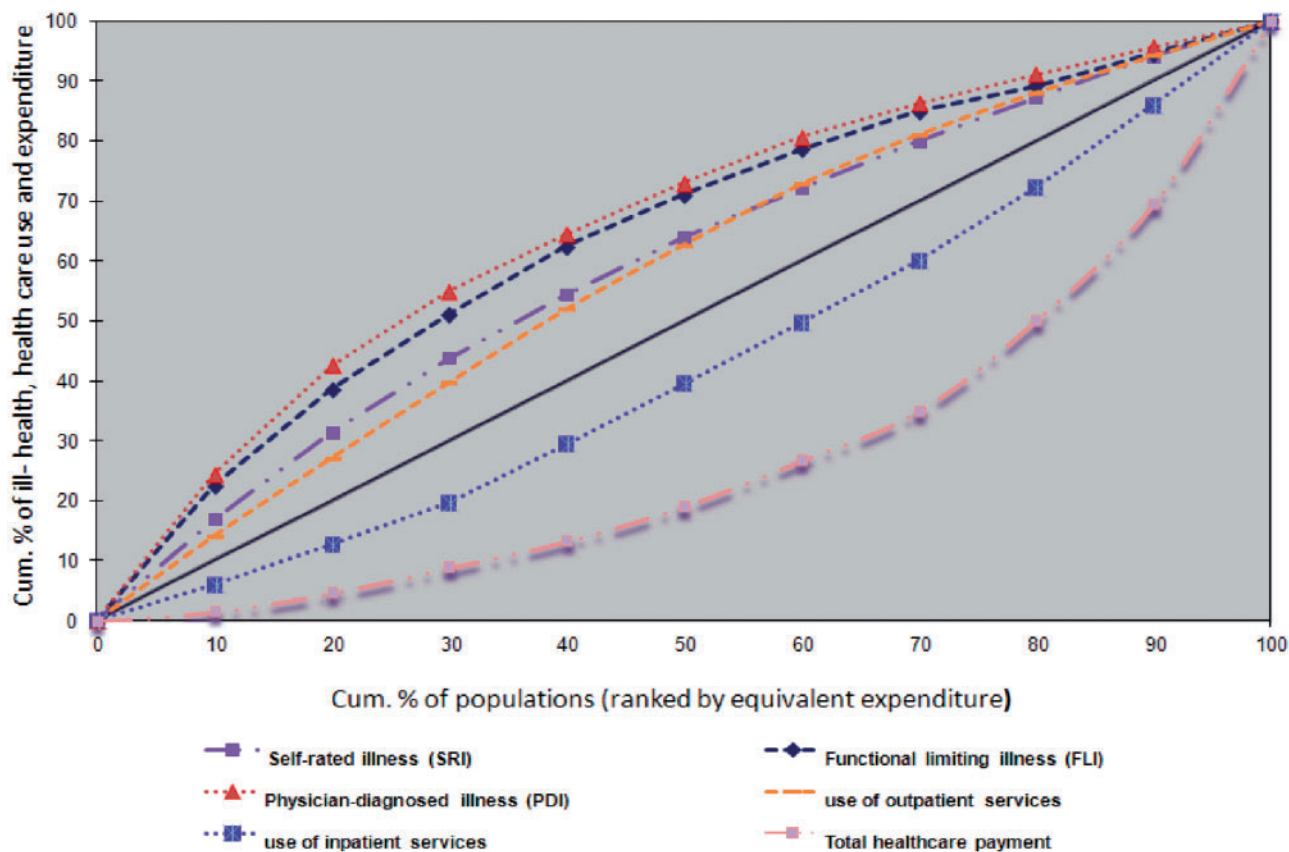
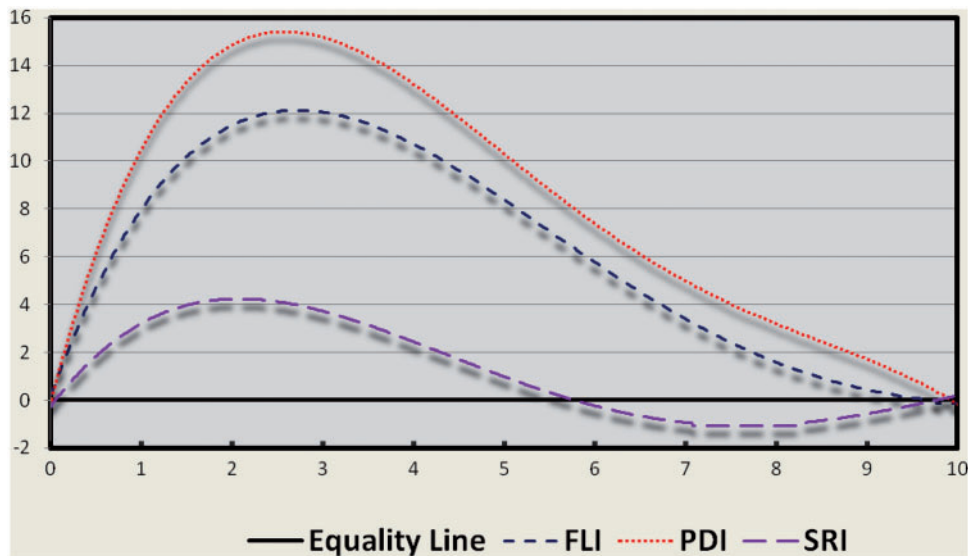**Figure 1** Concentration curves of ill-health measures, utilization of and payment for, health care.

Figure 2 Inequalities in ill-health measures and utilization of outpatient.
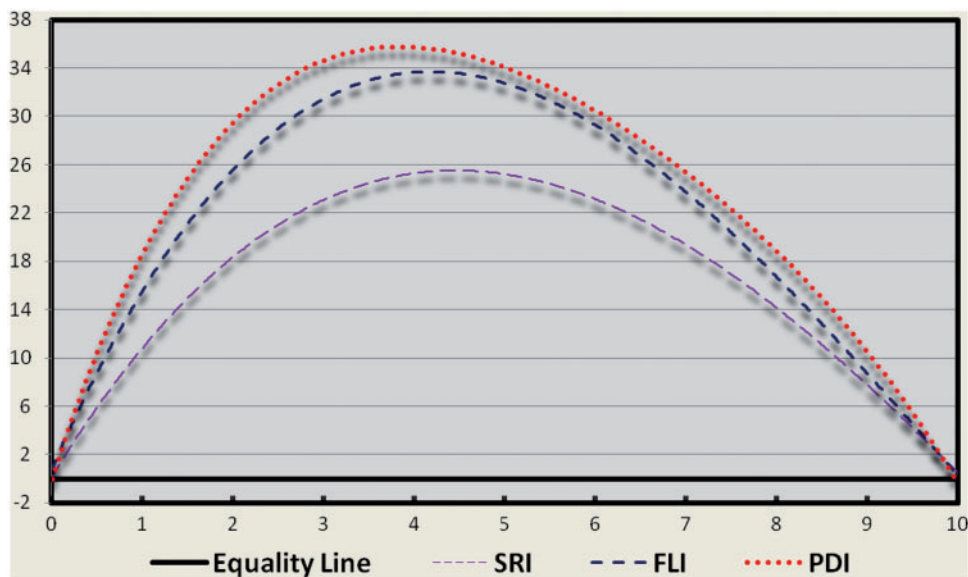

Figure 3 Inequalities in ill-health measures and utilization of inpatient.

better-off pay more not only to get more but also to get more of better quality service.

Differences between the concentration curves for each measure of ill-health and type of care are reproduced (across deciles) for illustrative purposes in Figures 2 and 3. The analyses, which serve as a reference point for the following results, yield $D_{(p)}$ (= $C_{use} - C_{ill}$), representing the respective differences in the illness and utilization shares throughout the p-ordinates. Hence, points above (below) the abscissae, i.e. the equality line, indicate a pro-rich (pro-poor) trend.

The further the $D_{(p)}$ curve lies from the equality line the greater the degree of inequity. The most striking feature of the chart is that in all but one case where need is proxied by SRH,

pro-rich inequalities as measured by the gap between illness, $C_{ill(p)}$, and utilization, $C_{use(p)}$, emerge, even if the extent of inequality gap varies across the three indicators of need, being always the largest when need is captured by PDI, followed by FLI and smallest for SAH.

However, since 'need'—proxied here as in empirical work by SRH measures—tend to be correlated with socioeconomic status such as income, and given the fact that the rich and the poor may have different demographic characteristics, simple comparisons with the treatment received by groups may not fully reveal whether individuals in equal need are or are not being treated alike (Van Doorslaer *et al.* 1993). Thus, to test for 'horizontal inequity', standardization procedures for age, sex

and various ill-health indicators are implemented as illustrated above. The analyses yield the 'need-expected distribution' for each type of care.

Results that are shown in Table 2 reveal a somewhat similar picture to that produced by simply examining illness (utilization) distributions. For instance, comparing the distribution of actual utilization of outpatient services to that of need-expected utilization shows that the share of outpatient care accruing to the poorest 50% of Tunisians is always lower than what would be expected given their need for such type of care, whereas the opposite pattern is observed for the wealthy half of the population. Dominance test results, presented in Table 2, provide, however, important supplementary information for these patterns. At the decile level, the estimated 'Z-statistics' exceed the SSM critical value $Z*$ (at the 95% level), but only at points below the 70th percentile, confirming that the shares of outpatient care received by the top 30 percentiles are not statistically significantly different than their share of need for such care. Overall, the distributional outcome associated with the entire curve suggests that the distribution of need-expected dominated the corresponding actual use—as reflected by the estimated 'Z-statistics' concerning the entire curve. These patterns are also reflected by the summary values of the concentration indices of utilization and need, both of which emerge statistically significantly negative (-0.1707 and -0.2824 at the 95%), resulting in a positive value of the Horizontal Inequity index ($HI = 0.1117$), and consequently suggesting a pro-rich bias in the utilization of outpatient care services.

Results on inpatient services demonstrate quite opposite patterns with the share of use increasing monotonically with equivalent expenditure. Yet, the need-expected distribution for such type of care emerges 'very pro-poor', suggesting that need for inpatient care is more concentrated among the lower income groups. Such a pro-rich trend is confirmed by the estimated 'Z-statistics' for both the individual ordinates and the entire curves. The last column of Table 2 shows unambiguously that the need for inpatient care dominates (i.e. is more pro-poor than) the distribution of actual utilization: the individual 'Z-statistics' at each ordinate exceed the critical value at the 95% level, while the largest absolute value corresponding to the simultaneous test statistics, $Z+$, $Z-$, exceeded the SMM critical value at $Z*$. These differences in the pattern of the actual and need-expected utilization of inpatient care are also reflected in the corresponding concentration indices ($C_{use} = 0.1504$ and $C_{ill} = -0.2647$); consequently, a pro-rich Horizontal Inequity index of 0.4151 is obtained.

Discussion

This study has employed the commonly used summary measures of equity to assess fairness in healthcare payment and utilization in Tunisia. However, given the inherent interest in revealing all the available distributional information underlying these aggregate measures, differences between distributions are also presented and tested at the disaggregate level of analysis as per the decile ordinates. Several key points emerging from our analysis are worth discussion in light of the previous findings in the literature and the features of the healthcare system

under consideration. The overall picture is that out-of-pocket payments, which constitute a sizeable share in the current financing mix ($c51.3\%$ in 2008), emerged overall as a progressive means of health funding—as reflected by both the overall dominance relation and the significantly positive sign of the Kakwani index. Interestingly, however, when a more refined examination is conducted at the individual ordinates, such a pattern only holds over the richest half of the population. While this outcome corroborates earlier evidence on the importance of going beyond the summary measures of equity (Klavus 2001; Abu-Zaineh *et al.* 2008), it raises the important normative question of 'whether or not a "vertical equity" interpretation can be inferred from the observed progressivity'.

A review of previous studies suggests that in the context where payment for health care remains largely linked to utilization, standard interpretations of the observed progressivity might be misleading as possibly different, and sometimes contradictory, explanations can be speculated. For instance, some argue (Yu *et al.* 2006; Yardim *et al.* 2010) that progressivity of direct payments may reflect that the poor do avail of subsidized public services and exemptions, hence do pay a relatively lower share compared with the higher income groups, who favour private health services of higher quality. At the other extreme, it can be argued that the low proportions of health expenditures at the lower incomes are likely to reflect the 'deterrent effect' of the high out-of-pocket costs (Abu-Zaineh *et al.* 2011). Nonetheless, one may argue that given the *ex post* nature of such mode of funding and the fact that these payments are rather driven by the 'benefit principle', observed progressivity can reflect the underlying distribution of utilization of, and/or needs for, health care (Smith 2010). Although all above factors can have the same effect of making the distribution of healthcare payments look progressive, they clearly do not have the same implications for equity. While this calls for interpretative caution of the findings discussed above, further examination of the distribution of healthcare utilization in tandem with that of need was in order.

Our detailed results on the distributions of healthcare utilization for two types of health care, outpatient and inpatient services were, in effect, capable of shedding light on the above issues. The interesting question was, thus, 'whether the distribution of healthcare utilization reflects that of payments for health care, and whether there is horizontal inequity in the delivery of health care'. Among the distributions we study, only the distribution of outpatient care was found to be skewed towards the bottom end of income distribution, but not sufficiently so to meet the 'very pro-poor' distribution of need. Quite noteworthy, significant differences in the shares of use and need could only be identified for the lower and middle deciles. Considered jointly, this indicates that households in the top deciles, although appearing to pay progressively, are more likely to receive health care in proportion to their needs. In contrast, those in the lowest and middle deciles, though appearing to pay in proportion to their ATP, they still receive a relatively smaller share of outpatient care compared to their needs. The picture was dramatically different for inpatient care whose distribution emerged in favour of the better-off. Generally, these findings seem to support previous evidence that in the low- and middle-income countries, the better-off

Table 2 Distribution of actual and need-predicted utilization of outpatient and inpatient healthcare services at decile ordinates[a,b]

	Outpatient care				Inpatient care			
	Share of actual use	Share of need-predicted use	% differences in the cum. shares ($C_{ill} - C_{use}$)	Z-statistics	Share of actual use	Share of need-predicted use	% differences in the cum. shares ($C_{ill} - C_{use}$)	Z-statistics
Decile								
1st decile	14.10	17.42	3.32 (0.0313)	2.79**	6.01	16.02	10.01 (0.0406)	2.94**
2nd	13.01	15.02	5.33 (0.0223)	3.19**	6.68	15.09	18.42 (0.0249)	4.04**
3rd	12.59	13.91	6.65 (0.0211)	4.63**	7.03	14.01	25.40 (0.0219)	8.13**
4th	12.24	13.85	8.26 (0.0182)	6.89**	9.69	11.22	26.93 (0.0144)	9.67**
5th	10.74	11.01	8.53 (0.0147)	7.24**	10.12	10.13	26.94 (0.0204)	9.83**
6th	10.12	9.02	7.43 (0.0112)	4.14**	10.24	9.35	26.05 (0.0103)	7.57**
7th	8.27	6.51	5.67 (0.0227)	1.66	10.31	9.12	24.86 (0.0181)	6.52**
8th	7.03	4.31	2.95 (0.0177)	1.19	12.23	8.41	21.04 (0.0042)	5.02**
9th	6.12	4.94	1.77 (0.0154)	1.07	13.59	3.34	10.79 (0.0071)	4.71**
10th decile	5.78	4.01	–	–	14.10	3.31	–	
Dominance test								
Z+				**7.24**				**9.83**
Z–				**0**				**0**
Concentration/HI indices	**−0.1707 (0.0122)**	**−0.2824 (0.0143)**	**0.1117**		**0.1504 (0.0134)**	**−0.2647 (0.0143)**	**0.4151**	

[a]Standard errors in parenthesis.

[b]Significant progressivity/regressivity overall, where the critical value Z^* of the SSM ($\alpha = 0.05$, $k = 9$) is 2.77.

**Significant difference between the estimated individual ordinates at 0.05, where the critical value Z^* of the SSM is 1.96.

Bold values indicate significance at 5%.

are not only more likely to spend more but also to receive more health care than the poor (O'Donnell *et al.* 2008a; Abu-Zaineh *et al.* 2011).

These findings seem to reflect specific features of the healthcare system under consideration. For instance, the insignificant distributional outcomes of progressivity observed at the lower income levels can be attributed to the heavy reliance of the vulnerable groups on the subsidized public services, mostly for primary outpatient services. This is also consistent with our finding that use of outpatient services is in favour of the poor indicating that direct payments are less of a barrier to consumption of such type of care compared with inpatient services. Indeed, several reforms were undertaken in Tunisia during the last two decades to expand access to healthcare services through extending health insurance coverage (Achouri 2005). Beside the formal 'National Health Insurance Fund', covering ~66% of the population, mostly formal sectors employees, there are two public medical aid schemes: the 'free healthcare scheme', which covers ~8% of the population defined according to the local poverty line, and the 'reduced-fee plan', which covers ~25% of the population whose monthly income falls below the minimum wage rate (Arfa *et al.* 2007).

This expansion in the breadth of coverage has, however, not been associated with a parallel improvement in the supply capacity of the public health system or in the depth of coverage to fully include the costly long-term and inpatient services (Arfa and Achouri 2008). Although Tunisia has a long history of public investment in health, the share of government expenditure on health has stagnated at ~8% of the total government expenditure during the last decade (World Bank 2006). The frequent unavailability of some prescribed examinations and medications at public facilities, the deterioration in the quality of services, as well as the underfunding of public facilities, following the sharp drop in the state budgetary expenditure on health, have all fuelled the rise in the role of the private sector (~22% of the total bed capacity and 70% of the top-of-the-range medical equipment) (Achouri 2005). The private services, which are sustained by comparatively higher user charges, rely on the demand for higher quality health services from the high-income groups (Arfa and Achouri 2008). Results from our survey indicate that of the total 36% of private admissions, 22% were made by households belonging to the higher half of income deciles. While almost half of outpatient visits took place at private sector services, the latter is found to absorb the lion's share of total direct expenditures (~79.6%) (WHO 2006). The seemingly progressive character of direct payments observed overall appears, thus, to be largely driven by the pro-rich utilization patterns of inpatient care services delivered mostly at the private sector facilities.

Although the analysis undertaken in this study used the latest nationally representative data, some practical limitations must however be acknowledged. First, the absence of reliable data on funding from other sources, such as taxes, social and private insurance, has made it impossible to estimate the amount that would have been paid through these sources for health care. Including such data would have offered the opportunity to infer overall progressivity of the healthcare financing mix. However, it is worth noting that the amounts of health funding from these sources are generally structured, with the exception of the risk-related private insurance premiums and indirect taxes, to be progressive. Second, as in similar studies on inequality measurement in health care, our estimates of need for health care are based on self-reported illness. Although the present analysis has made use of more than one measure of need to compare the reliability of our results, future research shall take into account the multidimensionality of health to construct a more proper specification of need.

Conclusion

This article has provided the first analysis of equity in the healthcare sector of Tunisia. Akin to many other developing countries, Tunisia still relies on direct payments to fund almost half of its health expenditure. Although the country tends to fare comparatively better with respect to equity in the finance of health care (at least insofar as progressivity is concerned), access to health services appears to be a crucial issue and a challenge to policy-makers, especially, in the context of the rapid epidemiological transition and the emergence of non-communicable diseases. In sum, the above results shed light on several policy relevant factors that ought to be taken into account in future reforms of the health system in Tunisia. While the pro-poor schemes shall be pursued to enhance the progressive character of health financing, reinforcing the supply capacity of the healthcare system and the depth of insurance coverage (by including inpatient services and medications in the benefit packages) seems to be a prerequisite step towards achieving 'effective coverage' that is capable of enhancing equity in healthcare utilization.

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