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Determinants of Health-Seeking Behaviour in Pakistan

ABSTRACT

Considering the low performance of Pakistan on health indices in the region, its fast-growing population, and higher poverty levels, this study aims to highlight the practical relevance of Grossman's health investment model by analyzing the health demand in Pakistan. To avoid the problem of endogeneity due to the interdependence of health capital and demand for medical care, we used the binary dependent variable. Logistic regression is employed to estimate the empirical model using microdata from Pakistan's Social & Household Integrated Economic Survey (2018-19). Results indicate that individuals with better income, education, and social respect demand more healthcare as they value a healthy lifetime high. Due to the higher cumulative risk of illness, females' health demand is higher than males. While individuals engaging in sports and recreational activities care about their anticipated future health outcomes and hence demand more healthcare. Finally, the regional control variables show that people seek fewer healthcare services in rural areas and Balochistan province due to financial constraints, lack of healthcare facilities, and transport issues.

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Author's contribution in the article: 1- Conceived and designed the analysis, 2- Reviewed and compiled the literature, 3- Collected the data, 4- Contributed data or analysis tools, 5- Performed the analysis, 6- Wrote the paper, 7- Financial support for the conduct of the study, 8-Other

1. INTRODUCTION

Pakistan is the sixth most populous country in the world with a growth rate of 2.4 percent and, its population stands at 207.8 million (Census, 2017). Moreover, the ranking of Pakistan on the Human Development Index is 154 out of 189 countries (HDR, 2020). The shifting demographics in Pakistan are contributing to fast population growth and higher poverty levels. Pakistan's health indices have improved slowly in the last few years. Under-5 child (infant) mortality (per 1000 live births) rate(s) have steadily declined from 252.4 (185.3) in 1960 to 67.2 (55.7) in 2019. Despite the significant improvement, these numbers are still higher than South Asia's average of 40.2 (33.1) for the year 2019. The maternal mortality rate per 100,000 live births has declined from 286 in the year 2000 to 186 in 2019 which is again higher than the regional average, 163 (The World Bank, 2020).

Out-of-pocket health expenses define an individual's or family‘s ability to fulfill their demand for healthcare (Ergete et al., 2018; Bala et al., 2022). Pakistan's out-of-pocket spending (percentage of current health expenditure) on health was 56.24 percent in 2018, 78.02 percent was the highest in 2006, and 54.87 percent was the lowest in 2002 (WHO, 2019). Looking at comparative statistics, for example, out-of-pocket spending percentages in the year 2018 for South Asia, and neighboring countries (Bangladesh, Sri Lanka, and India) were 62.36, 73.87, 50.65, and 62.67 percent, respectively. This expense, undeniably, has significantly hampered the search for adequate medical facilities in Pakistan. Life expectancy in Pakistan is lowest at 67.3 in comparison with regional countries, India (69.66), Bangladesh (72.6), Sri Lanka (76.98), and South Asia (69.6).

Such an epidemiologic transition to the predominance of non-communicable diseases is indicative of a major challenge for Pakistan’s healthcare system and requires changes in respective healthcare strategies in Pakistan. While the health system is shifted to provinces, the allocation of services and obligations to levels remains uncertain since the 18th amendment, leading to health inequalities due to inadequate and uneven allocation of resources (Nishtar et al., 2013) among the provinces. Thus, it is important to understand the factors behind the demand for medical care. Grossman’s health investment model is a standard economic theory in this regard (Grossman, 2022).

Several studies attempt to ascertain the determinants of health demand in Pakistan (Toor, & Butt, 2005; Shaikh, 2008; Akbari et al., 2009; Abbas, & Hiemenz, 2011; Malik, & Syed, 2012; Abbas & Nawaz, 2020; Mushtaq et. al., 2020) however, empirically testing the relevance of the Grossman’s model is not attempted. Considering the increase in income (real GDP per capita) in Pakistan, growth in healthcare spending can be explained by Grossman’s (1972a, 1972b, 2000) health investment model (Hall & Jones, 2007). In Grossman’s approach, inputs that produce investment in a better health status include direct expenditure on medical services (Bala et. al, 2022) and the opportunity cost of time layouts on health. Therefore, based on Grossman’s standard model assumptions, this study attempts to explore the determinants of health demand in Pakistan using the latest available microdata of the Social & Household Integrated Economic Survey (2018-2019). The study is important because understanding the determinants of health demand in Pakistan can help policymakers to distribute scarce resources effectively and efficiently. Further, the government’s intervention in the right direction would lead to increased individual welfare.

2. THEORETICAL AND EMPIRICAL MODEL

The underlying assumption of Grossman’s model states that utility is generated by the amount of healthy time $h(t)$ and the consumption of household commodities $Z(t)$. Consider the following individual’s lifetime utility function.

$$\max_{I,z,T} \int_0^T U[Z(t), h(t)]\mathrm{e}^{-\rho t}\,\mathrm{d}t \qquad (1)$$

with $U(\cdot)$ and $h(\cdot)$ are differentiable, concave and strictly increasing functions. The parameter ρ represents the discount rate. The lifetime utility function can be maximized subject to the following constraints.

The health capital stock, $H(t)$, depreciates at a steady depreciation rate, $\delta(t)$, and can be upgraded by investments, $I(t)$, in health assets (Grossman, 2000). Individuals' specific health endowments which can't be controlled determine the depreciation rate.

$$\dot{H}(t) = I(t) - \delta(t)H(t) \tag{2}$$

The general form of health investment can be expressed as follows

$$I(t) = f_I\big(M(t), m(t); E(t)\big) \tag{3}$$

where, M(t), m(t), and E(t) represent the medical services, time outlays in health, and individual's knowledge in terms of total factor productivity. Furthermore, household commodities are produced according to

$$Z(t) = f_z\big(Q(t), k(t); E(t)\big) \tag{4}$$

with non-medical market goods, $Q(t)$ and consumption time, $k(t)$.
For an individual's lifetime, the budget for medical care and other market goods is restricted by initial wealth and wealth gains over time.

$$\dot{A}(t) = rA(t) + y(t) + wh(t) - C_1(t) - C_Z(t) \tag{5}$$

Wealth $A(t)$ grows over time with r rate of return, other income $y(t)$, wage w, and decrease by consuming medical care C_1 and market good C_Z. Furthermore, an individual's time constraint is given by.

$$\vartheta(t) = l(t) + m(t) + k(t) + s(t) \tag{6}$$

where $\vartheta(t) - s(t) = h(t)$. Thus, total time $\vartheta(t)$ is divided into labor time $l(t)$, time outlays in health $m(t)$, consumption time $k(t)$, and sick time $s(t)$.

Considering this theoretical model and following Nocera and Zweifel (1998) and Burggraf et al. (2016), this paper estimates the following empirical model:

$$hd_i = \beta_0 + \beta_1 edu_i + \beta_2 age_i + \beta_3 gender_i + \beta_4 hm_i + \beta_5 m_i + \beta_6 y_i + \beta_7 emps_i + \varepsilon_i \tag{7}$$

where the variables are defined in table 1 below.

3. DATA, CONSTRUCTION OF VARIABLES, & METHOD

This study uses the microdata from Pakistan's Social & Household Integrated Economic Survey (2018-19) conducted by the Pakistan Bureau of Statistics (PBS). A two-stage stratified sample design is employed in this survey. The survey provides socio-economic and demographic variables for the 24,809 households as well as personal characteristics that include employment, wages, schooling, health, hygiene, sewage, accommodation, etc. Out of 159,949 individuals, 49 percent are male and 51 percent are female, 65 percent belong to rural and 34 percent belong to urban areas. The average monthly household income is PKR 41,545

with average monthly household consumption of PKR 37,159 and per capita, monthly consumption expenditure is PKR 5959.

Information on health demand is not provided explicitly in Pakistan's Social & Household Integrated Economic (HIES) Survey. Therefore, health demand is defined as whether an individual has sought health care during the last three months, and had any household member visited a health care provider for any other reason "unrelated to illnesses". Additionally, the binary nature of the variable allows us to cater to the potential endogeneity problem due to the interdependence of health capital and demand for medical care (Burggraf et al., 2016). Keeping in view the binary nature of our outcome variable, we employ binary logistic regression to estimate the demand for health in Pakistan using the following logistic function.

$$P(Y = 1|X) = \frac{1}{1+e^{-X\beta}} \tag{8}$$

where P is the conditional probability of health care demand and X is the matrix of determinants of health (see table 1). Equation (8) can be rearranged as follows:

$$\log\left(\frac{P}{1-P}\right) = X\beta \tag{9}$$

Binary regression allows both continuous and categorical variables to predict the outcome variables with the least distributional assumption in comparison with conventional regression models like Ordinary Least Squares (OLS).

Considering the explanatory variables for the health demand function, the theoretical construct knowledge is indicated by the education which is proxied by the literacy rate (Becker, 2018). Income is an important indicator of demand for health however due to reporting and measurement biases in income, per capita consumption quintiles (Sassi et al., 2018) are used as a proxy for household income. Furthermore, consumption expenditures cater to both labor and non-labor incomes of the households as well. Denisova (2010) highlights the importance of social respect in her study of Russian adult mortality. We, therefore, based on the local norms, considered the employment categories as a proxy for social respect (Lahtinen et al., 2020). Health investment is measured by the per capita expenditure on recreational activities which positively impacts the health status and smoking is taken as a negative health investment (Heckman et al., 2018). Other control variables include provincial dummies, age, and gender of the individual.

Table 1: Variables and Definitions

Variable	Definition
$hd = \begin{cases} 1 \\ 0 \end{cases}$	Takes value one if any member of the household got sick in the last three months or visited the health center for nonmedical reasons and zero otherwise.
Age	Age is divided into three categories; below 15 years, working age (15-60), and above 60.
Edu	The literacy rate is used for the education of an individual.
m	Per capita expenditure of recreational activities is used as a health investment.
hm	Smoking is used as a negative health investment proxy.
$epms$	Employment categories: self-employed, paid employed, unpaid family helper, work in agriculture and not working.
y	Per capita consumption quintiles.
Gender	A dummy variable (Male=1, Female=2).

4. RESULTS AND DISCUSSION

Table 2 presents the estimates of the parameters identified in equations (7 & 9) above for the health demand. Logistic regression is the natural choice when studying the outcomes that are naturally or necessarily represented by a binary variable (Mood, 2010). It is evident from the results that higher income (y) tends to increase health demand which corroborates with the findings in other studies (see e.g., Cropper, 1977; Wagstaff 1986; Alam et al. 2010; Galama et al., 2012; Yoo, 2022). People with better earnings or wealth have more health reserves (Cropper, 1977) implying high consumption expenditure and a high value of healthy living which results in high demand for health (Burggraf et al., 2016; Cheah et al., 2021). Therefore, it is optimal for an individual to increase their health investment as the stock of health deteriorates with age. Our results show that the demand for health increases with age which corroborates with the positive relationship between health demand and age suggested in the literature (see e.g., Di Matteo, 2004; González-González et al., 2011; Murthy & Okunade, 2016; Blanco-Moreno et al., 2013; Lopreite & Mauro, 2017; Cheah et al., 2021).

Furthermore, education is positively and significantly associated with the increase in health demand which can be explained by the fact that knowledge E(t) determines the efficiency of health investment. The level of knowledge here is proxied by the literacy status of the individual. The studies of Wagstaff (1986), Muurinen (1982), Gerdtham & Johannesson (1999), Burggraf et al. (2016) and Yoo (2022) also support the claim that literate people are conscious about their health and hence demand more healthcare (Cheah et al., 2021; Saah et al., 2021). Moreover, literacy explains the welfare at the household level as 90 percent of the literate people fall in the richest quintile (HIES, 2018-19) in Pakistan.

Gender is intended to control biological and behavioral variation in the health demand model. Gender is significantly associated with the demand for health, female are more demanding compared to males. Hyder et al. (2005) recognize that women have a higher cumulative risk of illness than men, because of infant and maternal health complications, and significant years of life are lost leading to inadequate perinatal outcomes. Additionally, over time, a gap in male and female literacy rates is decreasing in Pakistan and the stock of knowledge E(t) for female individuals is increasing, thus resulting in a higher relative health demand.

Individuals who engage in sports and adopt healthy lifestyles tend to have higher health demands which are depicted in our results as well, lesser spending on recreational activities implies low demand for health which corroborates with the findings in Burggraf et al. (2016). Participation in recreational activities plays a key role in the well-being of the individual by reducing different health problems (Bryans, 1970). On the other hand, the health hazards of smoking lead smokers to consume more medical resources to maintain their stock of health than non-smokers thus resulting in higher demand for health (Rice et al., 1986). Variables like engaging in sports or recreational activities or smoking can be used as proxies to measure the ability of an individual to anticipate future health outcomes of today's discretionary choices. The more they engage in sports and avoid smoking, the more they care about their anticipated future health outcomes (Burggraf et al., 2016).

Table 2: Empirical Results

	Dependent: Health Demand		
Variables	**Odds Ratio**	**Z**	**P>|z|**
Age			
≤15	1(base)	...	...
15-60	2.061	19.91	0000
≥60	4.3261	34.84	0000
Education (Edu)			
No	1 (base)	...	...
Yes	1.2161	5.18	0.000
Gender			
Male	1 (base)	...	...
Female	1.1239	6.56	0.000
Employment status (emps)			
Self-Employed	1 (base)	...	...
Paid employed	0. 6500	-10.46	0.000
Work in agriculture	0.8540	-3.09	0.002
Not working	0.8306	-4.68	0.000
Unpaid family helper	0.5860	-10.62	0.000
Smoke (hm)			
No	1(base)	...	...
Yes	1.0428	2.40	0.016
Income (y)			
Poorest	1 (base)	...	...
Second	1.1274	4.77	0.000
Middle	1.2125	7.59	0.000
Fourth	1.2647	8.83	0.000
Highest	1.3155	9.22	0.000
Recreational Expenditure (m)			
0-20	1 (base)	...	...
20-50	1.0623	2.74	0.005
50-100	1.1140	4.96	0.000
≥100	1.1728	7.10	0.000
Province			
Baluchistan	1 (base)	...	...
KPK	1.6344	14.90	0.000
Punjab	1.9642	22.56	0.000
Sindh	1.9018	20.54	0.000
Region			
Rural	1 (base)	...	...
Urban	1.0569	3.03	0.002
n=159,949	Wald chi2(29)=910.3,	Prob=0.0000	

Denisova (2010) finds that a higher self-perceived respect status significantly improves the probability of increased longevity. Following Lahtinen et al. (2020), this study considers the employment categories as a proxy for self-perceived social respect. Results indicate that self-employed being the most regarded job status in Pakistan has a higher demand for health as compared to others. Due to the presumed positive correlation between socioeconomic prosperity and self-employed job status (Gilbert et al., 2004), health demand increases, thus self-employed individuals value more to stock of health more than others (Rietveld

& Kiverstein 2014; Cheah et al., 2021). Finally, the regional control variable shows that health demand is higher in urban areas as compared to rural settlements. Rural individuals tend to seek fewer healthcare services due to financial constraints, unavailability of trained physicians, and transport issues (Douthit et al., 2015; Cheah et al., 2021; Banerjee, 2021). Provincewise comparison indicates that the health demand is least in Balochistan. Due to a lack of facilities, infrastructure, and bad law & order conditions, it is difficult to attract and retain physicians in Balochistan. Furthermore, people are financially constrained due to the highest incidence of poverty in Balochistan (Islam & Zafar, 2020).

5. CONCLUSION AND POLICY IMPLICATIONS

Considering the low performance of Pakistan on health indices relative to the neighboring countries in the region and the contribution of the shifting demographics to fast population growth and higher poverty levels, it is important to understand the factors determining the health demand in the country. Grossman's health investment model is a standard economic theory in this regard. However, it has been argued in the literature that Grossman's health investment model may fail in practical applications as the model assumes that health demand increases with higher health status. Therefore, the main aim of this study is to test the practical relevance of Grossman's health investment model in the context of Pakistan.

We employed the standard theory of Grossman to specify our empirical model. It is estimated that income significantly determines the health demand in Pakistan. People with better earning streams have a high value of healthy life and thus, invest more in their health stock (Burggraf et al., 2016; Cheah et al., 2021). It is found that health demand increases with age which is in line with the theory, health stock decreases with age. Furthermore, education is positively and significantly associated with the increase in health demand which can be explained by the fact that knowledge E(t) determines the efficiency of health investment. Literate people are conscious about their health and hence demand more healthcare. Gender is significantly associated with the demand for health, due to a higher cumulative risk of illness, females are more health demanding as compared to males (Hyder et al., 2005). Based on the findings, the government should invest in education to increase the stock of knowledge leading to better health stock. This would help to reduce the government's expenditure in the health sector. Furthermore, the female & elderly population should be the focus of all health-related policies as the demand for health is higher for them.

Individuals who engage in sports and adopt healthy lifestyles tend to have higher health demands which are depicted in our results as well, lesser spending on recreational activities implies low demand for health. The more they engage in sports and avoid smoking, the more they care about their anticipated future health outcomes (Burggraf et al., 2016). This study considers the employment categories as a proxy for self-perceived social respect (Lahtinen et al., 2020). The presumed positive correlation between socioeconomic prosperity and self-employed job status (Gilbert et al., 2004) contributes positively to health demand, thus self-employed individuals value more to the stock of health more than others (Rietveld & Kiverstein, 2014; Cheah et al., 2021). Finally, the regional control variable shows that health demand is higher in urban areas as compared to rural settlements and provincewide comparison indicates that the health demand is least in Balochistan. Hence, the place of residence has a significant impact on health-seeking behaviors (Banerjee, 2021; Cheah et al., 2021). The reasons for low health demand in rural areas and Balochistan province includes financial constraint, unavailability of trained physicians, and transport issues (Douthit et al., 2015). The provision of sports facilities at the grassroots level would not only engage our youth in healthy activities but also reduce the burden of diseases from the government's expenditure. Creating a conducive environment for entrepreneurial activities in the country provides better earning opportunities and hence better stock of health in the country.

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