

Original Article**PRIME MINISTER'S NATIONAL HEALTH PROGRAMME (PMNHP): A COST COMPARISON ANALYSIS**Shaikh Hussain¹, Rubina Hussain¹, Assad Hafeez², Adnan Khan³¹Fellow of Health Services Academy, Quaid e Azam University, Islamabad, Pakistan²Dean and Head of Research and Development, Health Services Academy, Islamabad, Pakistan³Department of Health Economics, Health Services Academy, Quaid e Azam University, Islamabad, Pakistan**Correspondence:** Dr Shaikh Hussain, Email: msphs15hussain@hsa.edu.pk**Abstract****Background:** Prime Minister's National Health Programme (PMNHP) is a publically funded cashless scheme at point of service, which was initiated in December 2015 to provide access to universal healthcare to people living below poverty line for indoor secondary and tertiary healthcare services for priority diseases in Pakistan.**Objective:** Our study aimed to compare prices of PMNHP districts packages, compare PMNHP with average payments made to healthcare providers by various health insurance companies, and compare prices among PMNHP itself, public sector not supported by the programme, and private healthcare not supported by the programme in Islamabad**Methods:** We conducted this comparative descriptive cross sectional study. For first two objectives, we collected secondary data, and for the third objective, we did convenient sampling of the treated patient (n=158) from PMNHP, public and private hospitals for selected diseases.**Results:** PMNHP district comparisons showed no significant difference among districts except Normal Delivery (NVD) at Rahim Yar Khan had lowest cost (mean=10111.11). For Diabetes Mellitus, Muzaffarabad had lowest (mean=1733.33), and Quetta had highest (mean=5300). Average price paid to healthcare providers by various insurance companies are on higher side as compared to PMNHP. Price differences were significant among PMNHP, Public Out of Pocket Spending (OOPS) and Private For NVD, [F(2, 27)=3364, p=0.000] with PMNHP (mean=15.000, SD=0.000) Public (OOPS) (mean=2.127, SD=0.221) and Private (mean=14.702, SD=0.658) For caesarian section [F(2,27)=2850, p=0.000], and Cholecystectomy, [F(2, 28)=221, p=0.000]. While in comparison with Private, PMNHP were cost beneficial for caesarian section (mean=32.016, SD=1.31) and Cholecystectomy (m=43.133, SD=6.648).**Conclusion:** PMNHP district wise packages are almost same among and for all the districts. Program is fairly and competitively priced against public and private healthcare providers, and private health insurance healthcare provider payments. PMNHP design features may be used to extend program in other districts.**Keywords:** Cost comparison analysis, universal health coverage, health insurance scheme, people living below poverty line**Introduction**

Access to universal healthcare for people living below poverty line is not easy in number of developing countries due to merely nonexistence of health insurance system for universal coverage. WHR 2000 outlined functions for improving health system that includes arrangement and allocation health finances and good governance or government stewardship (1). Implementation of targeted interventions for marginalized people are significant in Pakistan, where no compulsory health insurance (2). Insurance schemes have meager share in healthcare financing (3). In Pakistan; Out of Pocket spending is main source for healthcare financing (4). To extend access to universal healthcare to people living below poverty line, Prime

Minister's National Health Insurance Program (PMNHP) was launched on 31st December 2015 in phased manner (5).

In low income countries, healthcare services accessible to merely 11% of people living below poverty line due to financial constraints (6,7). In several under developed and developing countries out of pocket spending on purchase of healthcare products exceed more than 50% of total healthcare service expenses (8). Numbers of countries have designed their own health insurance model for healthcare financing to provide universal health coverage and financial risk protection. German, state owned healthcare insurance scheme provides coverage to almost 85% of their citizens without any preexisting condition (9). Japanese National Health

insurance provides financial coverage to not eligible population for Employees Health Insurance.^{10,11} US, Medicaid, Indian Vajpayee Arogyashree Scheme (VAS) for tertiary care,^(7,16) and Rashtriya Swasthya Bima Yojna (RSBY) for secondary care⁽¹²⁾ are designed for low income eligible people. British, National Health Service (NHS) ⁽⁹⁾ and Sri Lanka exclusively finances healthcare service through public revenue. ⁽¹⁶⁾ Iran has introduced Medical Insurance Fund (IMIF), on 50 percent co-payment basis ^(17,18). Pakistan is confronting number of challenges as far as its healthcare financing and resource allocation are concerned. Major issue is affordability of low income families to face catastrophic healthcare expenses ⁽¹⁹⁾.

PMNHP was launched for eligible families, living with daily income of \$2 per day and below were identified from the Benazir Income Support Program (BISP) survey 2010 database ^(2,5) were issued health cards up to PKR. 50,000 (US\$477) credit limits. In addition up to Rs 300,000 to cover treatment for seven priority diseases. Program was planned to start in phased manner in 23 selected districts, 3.2 million families are being benefited.

Prior to extend program in remaining districts as Phase II, it was felt to evaluate the program in terms of price comparison with healthcare provider payments made by various other private insurance companies, and health products price at public and private healthcare facilities for treatment and management of selected diseases and procedures. Our objectives were: (a) to compare price of PMNHP districts packages for treatment and management of selected diseases and procedures, (b) to compare healthcare providers' payments made by various health insurance companies in country with PMNHP packages for treatment and management of selected diseases and procedures, and (c) to compare price for treatment and management of selected diseases and procedures at public and private healthcare facilities of Islamabad District with PMNHP packages.

Methodology

Comparative Descriptive Cross Sectional Quantitative Study design was adopted. Selected diseases and procedures were Normal delivery (NVD), Caesarian Section (CS), Cholecystectomy (Chole), Diabetes Mellitus (DM) and Coronary Angioplasty (Angio). For objectives (a) and (b) secondary data were used. While for Objective (c) convenient sampling was done to select patient treated from selected diseases and procedures from PMNHP, public and private hospitals. Total 158 treated patients were selected, 30 each from NVD and CS, 31 each from Chole and DM and 36 from Angio. Primary data were collected by trained data collectors through survey questionnaire prepared according to WHO Guidelines 2002 ⁽²⁰⁾. Similarly, for objective (a), relevant authorities were approached for secondary data regarding district PMNHP packages and list of enrolled clientele along with clientele who utilized

services of PMNHP up to 15th Oct 2016. For objective (b), various Insurance companies were approached for provision of data regarding average price paid to healthcare provider during year 2016 for treatment of selected diseases/procedures. For objective (c), data were collected from living treated patients from PMNHP, public and private hospitals through survey questionnaire by trained data collectors. We compared the price of various districts PMNHP packages, payments made to healthcare facilities in Pakistan by various health insurance companies, and price paid by treated patients under study at public and private sector hospitals in Islamabad for purchase of health products for treatment of selected diseases/procedures. PMNHP district packages and comparison between PMNHP packages and average payments made to healthcare providers by various health insurance companies in year 2016 for selected disease and procedures were cross tabulated. Price comparison among PMNHP, Public(OOPS) and Private healthcare providers were conducted through one way analysis of variances (ANOVA) to assess the significance of the difference among groups and within groups. Assumptions regarding normality and homogeneity of variance were tested. Pairwise multiple comparisons were generated by using Tuckey's honestly significant difference (HSD) post hoc criterion for significance.

Results

Comparison of PMNHP Districts Packages

Table 1 represents price comparison of PMNHP district packages at empanelled healthcare facilities for treatment and management of selected diseases and procedures. For NVD package RYK had the lowest cost. In case of CS and Chole prices were almost same. In management of DM (both insulin and non insulin dependent), Mzd had the lowest and Qta had the highest all inclusive costs. Among empanelled healthcare setups of PMNHP, facilities for angioplasty were only available at ICT.

Table 1: PMNHP Packages - District wise Comparison (PKRs in thousands)

Disease/ Procedure	District	Minimum	Maximum	Mean	Std. Deviation
NVD	ICT	10.000	15.000	13.333	2.887
	MZD	15.000	15.000	15.000	0.000
	Kotli	10.000	15.000	13.675	2.454
	Qta	15.000	15.000	15.000	0.000
	RYK	10.000	11.000	10.111	0.333
CS	ICT	15.000	15.000	15.000	0.000
	MZD	15.000	15.000	15.000	0.000
	Kotli	14.900	15.000	14.975	0.050
	Qta	15.000	15.000	15.000	0.000
	RYK	15.000	15.000	15.000	0.000
Chole	ICT	30.000	35.000	31.250	2.500
	MZD	30.000	30.000	30.000	0.000
	Kotli	28.000	29.700	28.850	1.202
	Qta	30.000	35.350	31.070	2.393
	RYK	25.000	40.000	30.000	5.345
DM ¹	ICT	1.500	2.500	2.000	0.500
	MZD	1.200	2.000	1.733	0.462
	Kotli	2.000	2.500	2.233	0.252
	Qta	4.500	6.000	5.300	0.671
	RYK	1.500	2.500	2.312	3.720
Angio	ICT	200.000	250.000	233.333	28.867

NVD; Normal Delivery, CS; Caesarian Section, Chole; Cholecystectomy, DM; Diabetes Mellitus, Angio; Angioplasty, ICT ; Islamabad Capital territory, Mzd; Muzafarabad, Qta; Quetta, RYK; RahimyarKhan

Table 2. PMNHP Package Vs Payment made by various Health Insurance Companies to healthcare providers in year - 2016

Variable	PMNHP Package		Insurance Company "A"		Insurance Company "B"		Insurance Company "C"	
	Avg LoS in days	Avg Price in PKRs	Avg LoS in days	Avg Price in PKRs	Avg LoS in days	Avg Price in PKRs	Avg LoS in days	Avg Price in PKRs
NVD	1-2	15000	2.42	24985	1.38	22516	1.89	23200
CS	2-3	15000	3.90	49147	2.27	39911	2.28	34115
Chole	3	30000	3.31	77522	2.70	83131	2.39	88892
Angio	4	227181	2.82	260158	1.90	193921	2.08	198396
DM	3.9	9090/ patient/ admission	5.26	54551/ patient/ admission	3.18	28079/ patient/ admission	2.58	24499/ patient/ admission
		2330/Day		10371/Day		8830/Day		9496/Day

LoS; Length of stay at hospital, Avg; Average, PKRs; Pak Rupees

Comparison of PMNHP Packages Vs Healthcare provider payment by Various Health Insurance Companies in year 2016

Table 2, shows comparison of price paid by various insurance companies to healthcare providers for general ward and PMNHP packages for selected diseases/procedures during year 2016. PMNHP's packages for selected diseases and procedures are on lower side as compared to other private insurance companies for year 2016.

Table 3. Price Comparison (Pak Rupee in Thousands) among PMNHP Vs Public and Private healthcare providers

Disease /procedure	Financing Method	Mean	Median	Min	Max	Std. Deviation	Variance	Kurtosis	Skewness
NVD n-30	PMNHP	15.000	15.000	15.000	15.000	0.000	0.000	.	.
	Pub(OOPS)	2.127	2.133	1.765	2.395	0.221	0.049	-0.729	-0.519
	Pvt(OOPS)	14.702	14.700	13.500	15.600	0.658	0.432	-0.143	-0.460
CS n-30	PMNHP	15.000	15.000	15.000	15.000	0.000	0.000	.	.
	Pub(OOPS)	4.453	4.628	3.515	5.000	0.563	0.317	-0.624	-0.853
	Pvt(OOPS)	32.016	31.750	30.500	34.455	1.310	1.719	-0.459	0.617
Chole n-31	PMNHP	30.000	30.000	30.000	30.000	0.000	0.000	.	.
	Pub(OOPS)	6.658	6.668	5.655	8.305	0.789	0.624	0.821	0.785
	Pvt(OOPS)	43.133	43.000	36.500	56.155	6.648	44.204	0.067	0.852
DM n-31	PMNHP	9.090	9.000	4.000	13.900	2.989	8.937	-0.377	-0.029
	Pub(OOPS)	5.105	5.345	4.230	6.645	0.898	0.808	-0.337	1.002
	Pvt(OOPS)	18670.9	18.500	11.000	36.040	7.848	61.593	0.934	1.058
Angio n-36	PMNHP	232.581	235.095	190.371	271.299	27.495	755.991	-0.744	-0.401
	Pub(OOPS)	182.418	176.600	162.050	215.900	17.488	305.824	-0.964	0.562
	Pvt(OOPS)	282.986	251.300	214.500	399.500	66.958	4483.340	-0.905	0.909

NVD; Normal Delivery, CS; Caesarian Section, Chole; Cholecystectomy, Angio; Angioplasty, DM; Diabetes Mellitus, Pub; Public, Pvt; Private, OOPS; Out of Pocket Spending, PMNHP; Prime Minister National Health Program

Comparison of PMNHP Packages with expense at Public and Private Healthcare facilities

Treated patients from selected diseases/ procedures (n-158) were surveyed for comparison of medical costs incurred through PMNHP, Public and Private Healthcare providers. Participants according to financing methods were PMNHP 50(31.65%), Public(OOPS) 52(32.91%) and Private(OOPS) 56(35.44%). Distribution of participants on basis of management of diseases and procedures were from for NVD and CS 30(18.99%) each, Chole and DM 31(19.62%) each and Angio 36(22.78%).

Table 4. Test of Homogeneity of Variances

Disease /Procedure	Levene Statistic	df1	df2	Sig.
NVD	11.564	2	27	0.000
CS	14.288	2	27	0.000
Chole	11.495	2	28	0.000
DM	9.882	2	28	0.002
Angio	12.418	2	33	0.000

NVD; Normal Delivery, CS; Caesarian Section, Chole; Cholecystectomy, Angio; Angioplasty, DM; Diabetes Mellitus

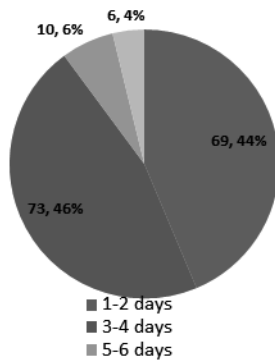


Figure 1: Average Length of Stay at Hospital
Table 5 . Analysis of Variances (ANOVA) Comparison of PMNHP Packages with expense at Public and Private Healthcare facilities

Disease/Procedure	ANOVA	Sum of Squares	df	Mean Square	F	Sig.
NVD	Between Groups	1079.779	2	539.889	3364.013	0.000
	Within Groups	4.333	27	0.160		
	Total	1084.112	29			
CS	Between Groups	3868.341	2	1934.171	2850.424	0.000
	Within Groups	18.321	27	0.679		
	Total	3886.662	29			
DM	Between Groups	1030.031	2	515.016	20.494	0.000
	Within Groups	703.636	28	25.130		
	Total	1733.667	30			
Chole	Between Groups	7090.517	2	3545.258	221.751	0.000
	Within Groups	447.651	28	15.988		
	Total	7538.168	30			
Angio	Between Groups	65467.645	2	32733.823	15.781	0.000
	Within Groups	68451.412	33	2074.285		
	Total	133919.057	35			

NVD; Normal Delivery, CS; Caesarian Section, Chole; Cholecystectomy, Angio; Angioplasty, DM; Diabetes Mellitus, Pub; Public, Pvt; Private, OOPS; Out of Pocket Spending, PMNHP; Prime Minister National Health Program

Table 6: Multiple Comparisons Post hoc Test - Tukey's HSD

Disease/Procedure	Financing Method (I)	Financing Method (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
NVD	PMNHP	Pub(OOPS)	12.873*	0.179	0.000	12.430	13.317
		Pvt(OOPS)	0.298	0.179	0.237	-0.146	0.742
	Pub(OOPS)	PMNHP	-12.873*	0.179	0.000	-13.317	-12.428
		Pvt(OOPS)	-12.575*	0.179	0.000	-13.019	-12.130
	Pvt(OOPS)	PMNHP	-.298	0.179	0.237	-0.742	-.14621
		Pub(OOPS)	12.575*	0.179	0.000	12.130	13.019
C S	PMNHP	Pub(OOPS)	10.547*	0.368	0.000	9.634	11.460
		Pvt(OOPS)	-17.016*	0.368	0.000	-17.929	-16.102
	Pub(OOPS)	PMNHP	-10.547*	0.368	0.000	-11.460	-9.634
		Pvt(OOPS)	-27.563*	0.368	0.000	-28.476	-26.649
	Pvt(OOPS)	PMNHP	17.016*	0.368	0.000	16.102	17.929
		Pub(OOPS)	27.563*	0.368	0.000	26.649	28.476
Chole	PMNHP	Pub(OOPS)	23.342*	1.788	0.000	18.917	27.766
		Pvt(OOPS)	-13.133*	1.747	0.000	-17.456	-8.810
	Pub(OOPS)	PMNHP	-23.342*	1.788	0.000	-27.766	-18.917
		Pvt(OOPS)	-36.475*	1.747	0.000	-40.798	-32.152
	Pvt(OOPS)	PMNHP	13.133*	1.747	0.000	8.810	17.456
		Pub(OOPS)	36.475*	1.747	0.000	32.152	40.798
D M	PMNHP	Pub(OOPS)	3.985	2.242	0.195	-1.562	9.533
		Pvt(OOPS)	-9.580*	2.190	0.000	-15.000	-4.161
	Pub(OOPS)	PMNHP	-3.985	2.242	0.195	-9.532	1.561
		Pvt(OOPS)	-13.566*	2.190	0.000	-18.986	-8.146
	Pvt(OOPS)	PMNHP	9.580*	2.190	0.000	4.161	15.000
		Pub(OOPS)	13.566*	2.190	0.000	8.146	18.986
Angio	PMNHP	Pub(OOPS)	50.163*	19.501	0.038	2.31	98.01
		Pvt(OOPS)	-50.406*	18.857	0.030	-96.68	-4.13
	Pub(OOPS)	PMNHP	-50.163*	19.501	0.038	-98.01	-2.31
		Pvt(OOPS)	-100.569*	17.917	0.000	-144.53	-56.60
	Pvt(OOPS)	PMNHP	50.406*	18.857	0.030	4.13	96.68
		Pub(OOPS)	100.569*	17.917	0.000	56.60	144.53

*. The mean difference is significant at the 0.05 level.

Table 4; after assuming homogeneity of variances, Table 5; an analysis of variances were performed for each category. ANOVA showed differences in price were significant for management of NVD. PMNHP for NVD was found more expensive than Pub(OOPS) and Private Table 6, Post hoc analysis using Tuckey's HSD criterion for significance indicated that mean difference was not significant in comparison of PMNHP with Pvt. Price comparison for CS and Chole were significant. Tuckey's HSD criterion for significance indicated that mean differences were significant. Mean cost of PMNHP both for CS and Chole were found on higher side as compared to Pub(OOPS). PMNHP were cost beneficial as compared to private(OOPS).

Discussion

Every country on globe has designed a customized version healthcare system in an attempt to provide universal access to healthcare services. Pricing of healthcare products vary among regions and countries. PMNHP is a public funded health insurance scheme that is free of cost at point of service delivery. Program provides universal healthcare access to people living below poverty line(5). Program design features were adopted from US Medicaid(6) and Indian models, VAS (7) and RSBY (15) for tertiary and secondary care respectively.

PMNHP district wise package comparison has revealed almost same rates were offered by the healthcare facilities. For NVD and CS, program offered the same price PKRs15000 to discourage un-indicated caesarian sections and encourage healthcare facilities to opt for normal delivery. Same trend was seen in management of all other selected diseases/procedures. In comparison of the program with other private health insurance scheme, the average lowest payment made to healthcare providers by any company is almost double with matching LoS at hospital of same category. Like Chole, PMNHP package costs PKRs30000 with LoS 3 days while lowest average price by any insurance company is PKRs77522 with LoS 3.31 days. Prices at private outfits through out of pocket spending are also not compatible with the program. However, at public healthcare facilities there is significantly lower cost effects were depicted. At public sector, major part of fixed and variable cost was bore by government exchequer, like consultancies, cost of hospitalization and other costs. Patients spend for only non-available medicine and other surgical supplies through OOPS. If these fixed and variable costs incurred at public Healthcare facilities are added, then total price of treatment may rise to competitive level. It was considered that program seems to be fairly priced through selected state owned insurance company.

US, Medicaid(6) provides access to universal healthcare to eligible low-income citizen. However, States may charge premiums as cost sharing in form of co-payments and co-insurance. Even then, many Medicaid enrollees are facing difficulties to find Healthcare providers, as

they were denied treatment due to complex administrative procedures and low reimbursement rates. A conservative estimation, based on reimbursements of claims on account of services and fees, revealed that US healthcare products prices may be considered much higher as compared to other developed countries. IFHP 2015 report(21) revealed average prices in US for NVD, CS and coronary angioplasty ranges from \$ 8011, CS \$11401, Angio \$15549. In Australia prices were for ND \$5312, CS \$7901 and Angio costs \$11164. While in South Africa prices were NVD \$1271, CS \$2192 and Angio \$6510. In 2016, NHS UK healthcare product prices²² with CC Score[^] Zero were for NVD and CS £1755, Chole £2595, Angio £2554 and DM £170.5 per day.

In Indian VAS program, empanelled hospitals do not entertain direct patient, instead they arrange periodic health camps to screen the eligible patients for treatment. PMNHP may be considered more clients friendly in comparison to US Medicaid(6) and Indian VAS(7) programs. Neither Indian VAS program(23) nor RSBY(24) provide access to healthcare services to people living below poverty line for any disease under study except coronary angioplasty that cost INR* 70000 in 2016 VAS packages(23). However in India, at private healthcare provider costs for NVD, CS and Angio INR 20000, 25000 and 120000 respectively for general ward. While at public healthcare settings OOPS for NVD and CS were approximately INR 2000 and 6000 respectively.

Conclusion

PMNHP district wise packages are almost same among and for all the districts. Program is fairly and competitively priced against public and private healthcare providers, and private health insurance healthcare provider payments. PMNHP design features may be used to extend program in other districts.

Limitations

Patients who are utilized public or private healthcare services, did not have actual accounting of cost, they relied on recall or memory. Cost effectiveness analysis in terms of improved health status of study population could not be done, and restricted to price comparison analysis.

Ethical Considerations

Study was reviewed and subsequently approved by the IRB of the Health Services Academy, Islamabad.

Conflict of Interest

Authors declared no conflict of interest

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