

PAKISTAN CHILDREN'S HEART FOUNDATION IMPACT REPORT



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ABOUT PAKISTAN CHILDREN'S HEART FOUNDATION (PCHF)

WE HAVE BEEN HELPING DESERVING & Needful Children Born With Congenital Heart Disease (CHD)



WHAT IS PCHF?

PCHF is a not-for-profit charity organization, registered with the Securities Exchange Commission of Pakistan, as a Section 42 Company. It was established in 2012 and provides fully funded and/or subsidized surgeries through partnerships to impoverished children born with (CHD) in Pakistan.

PCHF has international NFP status as well through its North America subsidiary-PCHFNA





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Pakistan Children's Heart Foundation

EXECUTIVE SUMMARY

Pakistan Children's Heart Foundation (PCHF) incorporates partnerships to develop a unique cost sharing framework between PCHF and 10 hospitals in Pakistan, both public and private. However, due to the scale of the problem, there is a need for enhanced alliances in the congenital heart disease (CHD) based social sector in Pakistan. This report provides an overview of the impact of partnerships with health- based NGOs in Pakistan. These include partnerships for (i) the exchange of resources (ii) for financing and (iii) for capacity building. We emphasize the need for value-based CHD health systems, as illustrated through PCHF's key performance indicators for the financial year 2021. Concluding with recommendations for future CHD health system strengthening.

Key Findings

PCHF's KPI's for the financial year 2020 suggest a positive correlation between partnerships and better health outcomes. Of 7 NGOs, PCHF has recorded the highest number of surgeries at the least average cost in the financial year 2020

PCHF has an in-hospital mortality rate of 6.8%.

Key Recommendations

Value-based healthcare through partnerships lay the groundwork for a government stake in improving access to CHD care in Pakistan.

It will also diversify the approach from CHD treatment to early detection and prevention.

Replicability of PCHF's framework provides potential for improving the efficiency and quality of complex care through the CHD non-profit sector.



PCHF is the only non-governmental organization (NGO) in Pakistan which focuses entirely and exclusively on pediatric CHD surgeries and interventions.

Excluding PCHF, there are a total of 6 NGOs in Pakistan that provide free CHD treatment.

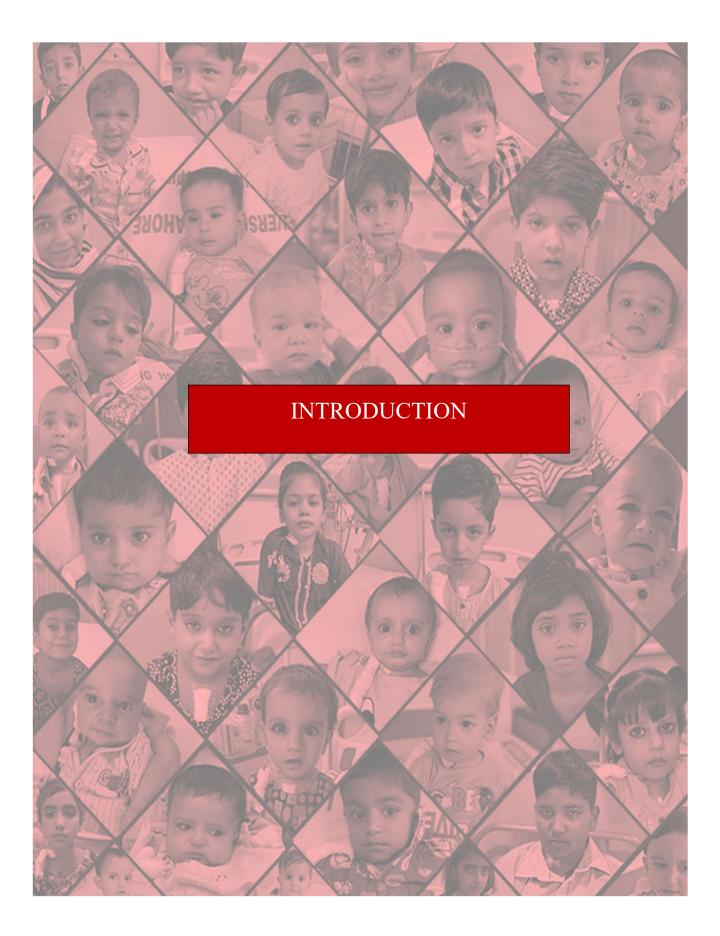
Other health-based national NGOs providing financing for CHD surgeries:

Aga Khan University Hospital Patient Behbud Society Taare Zameen Par Trust Transparent Hands Al Akhyar Foundation Nemat Saleem Trust Al Rehman Welfare School Trust



Abbreviations

- **PCHF-** Pakistan Children's Heart Foundation
- NGO- Non- Governmental Organization
- **CHD** Congenital Heart Disease
- NCD- Non-communicable Disease
- **OOP-** Out of Pocket Payment
- **KPI-** Key Performance Indicator
- **IOC-** Interorganizational Collaboration
- ICHOM- International Consortium for Health Outcomes Measurement
- IQIC- International Quality Improvement Collaborative for Congenital Heart Disease
- HRQOL- Health Related Quality of Life
- **GNP-** Gross National Product
- **CMH-** Combined Military Hospital
- **AKUH-** Aga Khan University Hospital
- **UOLTH-** University of Lahore Teaching Hospital
- **RMI-** Rehman Medical Institute
- **GOLI-** Gift of Life International
- WHO- World Health Organization
- RACHS- Risk Adjustment for Congenital Heart Surgery
- STAT- Society for Thoracic Surgery Congenital Heart Surgery Database Mortality Risk



Needs Assessment for Improving CHD Healthcare in Pakistan

The problem at hand can be divided into (i) the growing burden of CHDs in Pakistan (ii) socioeconomic disparity (iii) quality assessment.

The Burden of CHD in Pakistan

Non-communicable diseases account for 50% of the disease burden in Pakistan [13]. Of this, pediatric CHDs are the most common NCD in children under 5 years. In Pakistan, around 60,000 children are born with CHDs annually [1]. The incidence of moderateto-severe form of CHD is estimated to be about 6/1000 live births and prevalence overall is variable between 4.05 to 10.4 cases per 1000 live births. Only 40-50% of cases with CHD are diagnosed in the first week postnatal and 50-60% in the first month after birth [14]. 60% of these children are unable to live beyond the first few years of life [1]. Which brings the neonatal death rate by CHD in Pakistan to 3.7% [14]. This data adds detriment to the population health brings the neonatal death rate by CHD in Pakistan to 3.7% [15]. This data adds detriment to the population health status as infant mortality rate in Pakistan is already high. With improved diagnostic, treatment, and management options, CHD patients have a better prognosis and health related quality of life. The current CHD infrastructure and service delivery, unfortunately, impedes these targets. This presents CHDs as one of the leading causes of premature avertible mortality in Pakistan.

Socioeconomic disparity illustrated through key performance indicators

To give an overview of the pertinent problems with the health system in Pakistan, the three intermediate performance indicators from Roberts et al (2008) were used: These are summarized as follows: Efficiency. Modes of finance. Cost of service. Access to CHD treatment. Utilization of services. Quality. Health related quality of life (HRQoL).

Efficiency

(i) Modes of financing and cost of service

29.5% of Pakistan's population lives below the poverty line [10]. Less than 7% of government expenditures is allocated to health. This amounts to less than 1% of Gross National Product (GNP) [5]. Of this, approximately, a meagre 3% is allocated to public tertiary hospitals. According to the WHO benchmark, at least 6 percent of GDP should be allocated to provide basic and life-saving services. Pakistan's health expenditure is clearly below the WHO mandated minimum. Since the government is unable to spend on health in an optimal manner, the primary mode of finance for CHD treatment in Pakistan is Out of Pocket Payments (OOPs). Expenditure as OOP on health is a staggering 98%, positioning Pakistan among those countries with the highest share of OOPs relative to total health expenditure [25]. This has grave implications on the financing and delivery of healthcare and financial risk protection for the population. For CHD treatment in Pakistan, one surgery costs around PKR- 0.4-0.5 million [26]. With a high poverty index and high OOPs, this is prohibitive for poor families. Around 25% of CHD diagnosed children require surgical treatment within the first year of life or it could be fatal [1]. This makes Pakistan's CHD health system inefficient. The cost of service is high, and modes of financing are limited and inadequate.

Access

(i) Access to CHD treatment

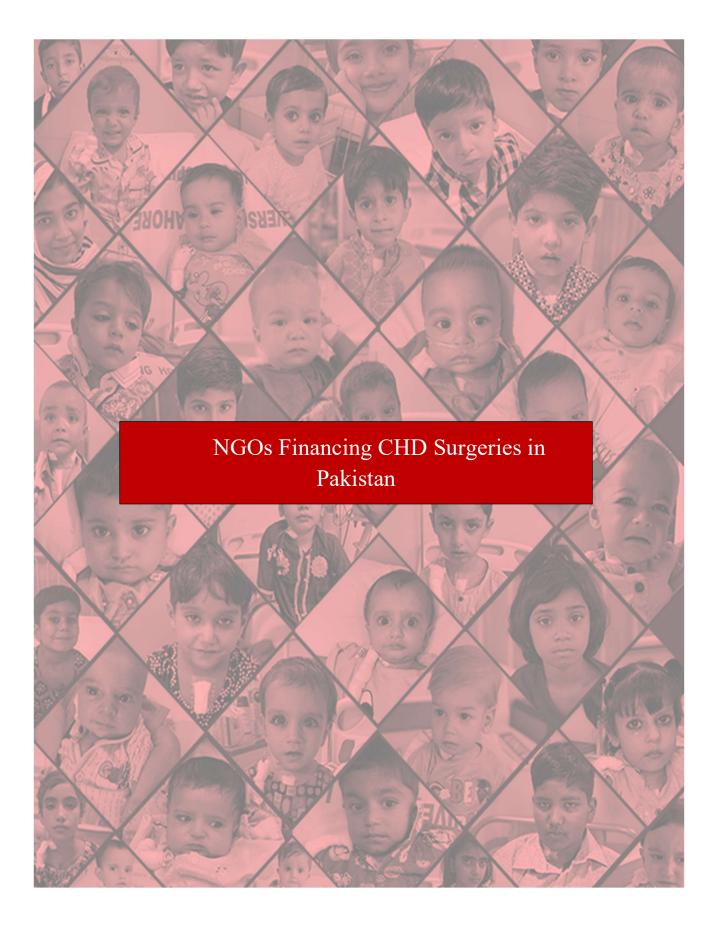
The Children Hospital and Institute of Child Health is the only public sector, tertiary care pediatric cardiac center for the entire province of Punjab with a population of over 100 million. Two other adult cardiology centers in the province provide some pediatric service but do not operate on children less than 10 kg in weight [16]. Pakistan has only 8 pediatric cardiac surgeons and 25 pediatric cardiologists nationwide [1]. An estimated 1600 patients wait for surgery with 2-3 children per bed [8].

(ii) Utilization of CHD treatment

A higher utilization of services in the private sector coincides with a higher literacy and income rate. In Pakistan, the overall literacy rate is 49% [2]. In addition, high OOPs with CHD treatment, and 24.3% of the population living below the poverty line. Both factors contribute to reduced utilization of health services by the lower socioeconomic class.

Health related quality of life (HRQoL) in CHD patients

HRQOL in CHD patients is defined to explain and organize measures concerned with the evaluation of health status, values and perceived levels of satisfaction and general well-being in CHD patients [17]. Due to existing hurdles of complex care in Pakistan, HRQOL in CHD patients is not prioritized. Treatment at present is more focused on survival rather than providing a CHD child with a full, healthy life. Many times, treatment is palliative, and patients do not survive because of untreated postoperative complications or comorbidities [18].



At least 1,800 NGOs provide free health care services in Pakistan. Of these, 16 provide free of cost cardiac surgeries. From these 16, 8 are NGOs and 10 are subsidiaries of tertiary care hospitals. Among all of them, PCHF is the only NGO which focuses entirely and exclusively on pediatric CHD surgeries and interventions. Aga Khan University Hospital's Mending Kid's Heart Campaign and Children's Hospital and the Institute of Child Health are the only tertiary care hospitals that provide free surgical treatment exclusively to CHDs. The other mentioned healthcare facilities offer either a combination of free adult and pediatric cardiac/CHD surgeries or pediatric general surgery with a few cases of cardiac and CHD surgery.

Pakistan Children's Heart Foundation (PCHF)

PCHF's mission is to establish a state-of-the-art medical facility that provides the highest quality of care for children with heart disease, irrespective of their financial means. It also aims is to act as a model institute that trains healthcare professionals, educates the public at large and promotes research into the causes and management of CHD. Its vision is to dispense treatment for all children suffering from CHD in Pakistan in an egalitarian manner so that not a single child suffering from CHD remains untreated.

Aga Khan University Hospital Patient Behbud Society

AKUH is one of the leading tertiary care hospitals in Pakistan. It covers all specialties. AKU BPS is an extension of this. It is responsible for the collection and distribution of Zakat for free health treatment for deserving patients. Even though AKU BPS currently has an IOC with PCHF from 2018.

Transparent Hands

Transparent Hands is an NGO with the largest technology platform for crowdfunding in the healthcare sector of Pakistan. It offers a complete range of free healthcare services including medical and surgical treatments, medical camps, and telehealth facilities to the underprivileged community of Pakistan.

Taare Zameen Par Trust

A Multan based NGO which provides aid in five areas: An old age home. Provision of free food, medicine, and clothing. Education and community development. and managing a center for providing employment opportunities.

Al Akhyar Mending Hearts

It was established in 2013. It provides free CHD surgeries, ophthalmic surgeries, and children's education.

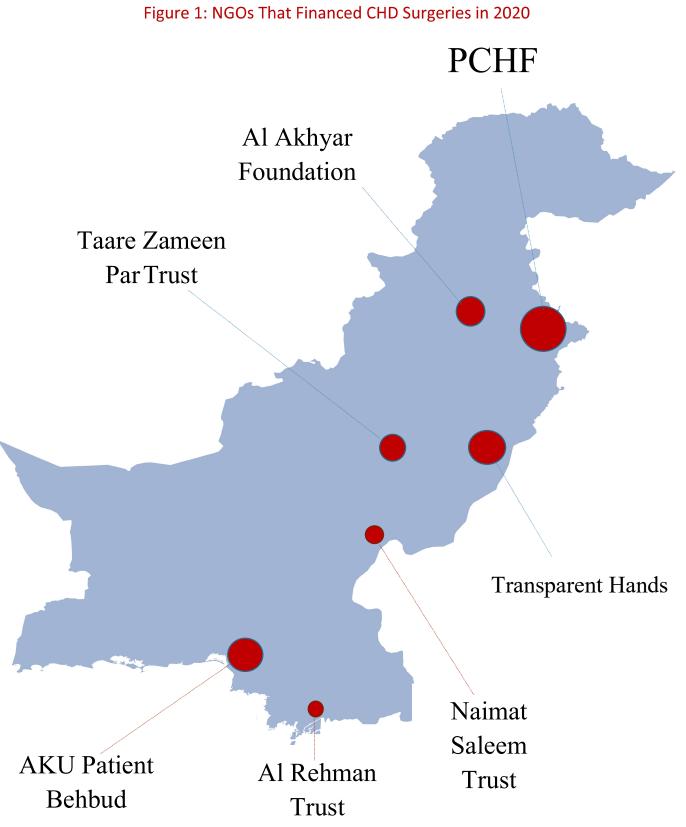
Naimat Saleem Trust

It is an NGO providing education, health care services, shelter, and humanitarian support to the needy and deserving people of Pakistan, nationally and internationally.

Al Rehman Welfare School Trust

A free, education for children-based welfare trust based in Karachi. Even though it is not health based, it is included in the report because it partnered with PCHF for sponsoring a child's surgery.





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Patient turnover for the financial year 2020 was collected from each NGO. Including the average cost per surgery. Only one NGO, Al Akhyar Foundation, had no subsidies with PCHF. The results are shown in table 1. According to this data, in terms of health-based NGOs, PCHF has recorded the highest number of CHD surgeries in Pakistan in the financial year 2020. That is, 498 surgeries in total. PCHF has also recorded the highest number of surgeries at the least average cost. As each CHD surgery costs Rs 400,000-500,000 on average, if a comparison is made between the number of surgeries and cost on average, there is an additional indication of cost containment for treatment in the mentioned NGOs.

ORGANIZATION	NO. OF CHD CASES	NO OF CHD CASES WITH PCHF	ESTIMATED COST (Rs.)	AVERAGE COST PER SURGERY (Rs)	
PCHF	498	498	183,298,230	368,069	
AKU PATIENT BEHBUD SOCIETY	308	11 (50% cost sharing with PCHF)	4,946,117 (50% cost of total cost with PCHF)	899,294	
TAARE ZAMEEN PAR TRUST	35	35 (50% cost sharing with PCHF)	7,718,136 (50% cost of total cost with PCHF)	441,036	
TRANSPARENT HANDS	39	24 (50% cost sharing with PCHF)	22,824,614 (Total cost= Transparent Hands+ PCHF)	585,246	
AL AKHYAR FOUNDATION	10-15	0	4,026,000 (100% financed by Al Akhyar Foundation)	268,400	
AL REHMAN WELFARE SCHOOL TRUST	Not recorded	1	267,500 (100% financed by PCHF)	267,500	
NEMAT SALEEM TRUST	Not recorded	2	1,000,000 (100% financed by PCHF)	500,000	

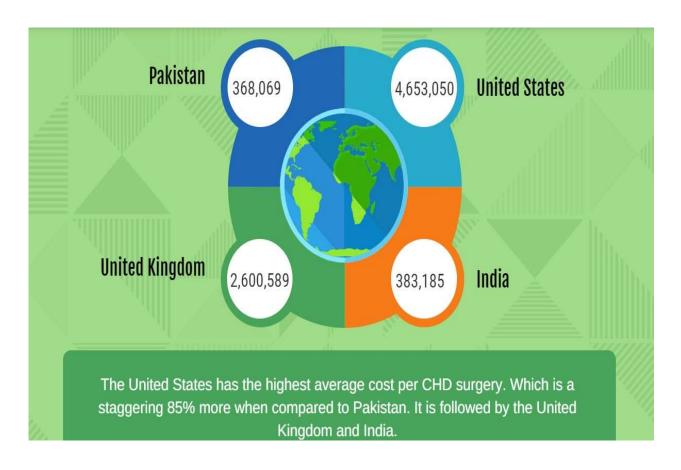
Table 1: Data of CHD procedures (interventions and surgeries) for the financial year 2020 (July 19-June 20)

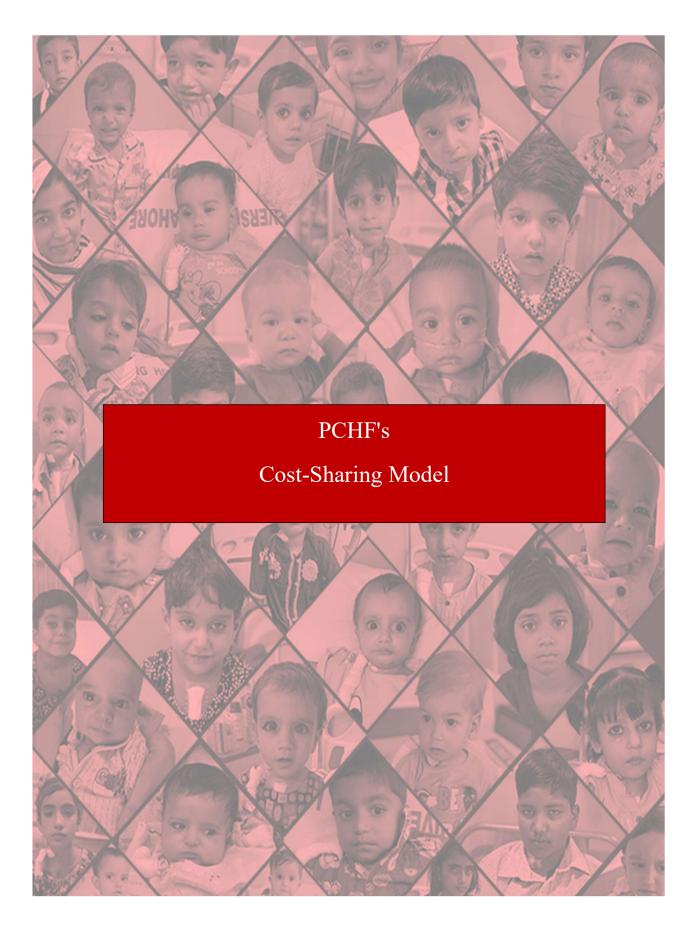


When we compare this data to High Income Countries (HIC), such as the United Kingdom (UK) and the United States (US), and neighboring India, Pakistan

shows a lower average cost per CHD surgery. [28][29][30]

Figure 2: Comparison of average cost per CHD treatment between Pakistan, India, the US and the UK. The cost is shown in PKR





Structure of PCHF's cost sharing model incorporates three categorical partnerships: (i) partnerships for exchange of resources (ii) financing and (iii) capacity building.

Partnerships for exchange of resources

Partnerships with hospitals

PCHF has horizontal integration with 10 affiliate hospitals nationwide. These include The Children's Hospital and Institute of Child Health, Ittefaq Hospital Lahore, University of Lahore Teaching Hospital, Aga Khan University Hospital Karachi, Hamid Latif Hospital, Combined Military Hospital Lahore, Armed force Institute of Cardiology in Rawalpindi, Rawalpindi Institute of Cardiology, Rehman Medical Institute in Peshawar and Faisalabad Institute of Cardiology. The primary objective is to provide subsidized treatment through these partnerships for CHD patients. This IOC system works through referrals. Referrals of CHD patients, PCHF and affiliate hospitals are two pronged. One method of referral is when a cardiologist from a PCHF IOC hospital refers a patient to PCHF after the patient has been diagnosed at the hospital. After this referral, PCHF performs a financial evaluation, allocates funds accordingly, and schedules a surgery for the patient in any of its IOC affiliate hospitals. The second method involves a patient coming to PCHF directly, a differential diagnosis is achieved through preliminary testing in PCHF's OPD, the patient is then referred to one of PCHF's IOC hospital. After a treatment plan has been recommended by the IOC cardiologist, PCHF allocates funds according to its financial evaluation. This IOC is for the enhancement of the pediatric cardiac surgery program as well as for financially supporting the heart surgeries & interventions of deserving patients. Each IOC hospital is mutually responsible for providing all necessary resources for surgical and interventional treatment of patients. There is also a secondary collaboration for patient data collection through sharing recorded data with providing medical equipment for PCHF's hospital project.

each hospital. This facilitates research initiatives and quality improvement. Some of PCHF's IOC hospitals extend 15% discount on all standard packages, excluding surgical team fees. The cost of disposables/consumables is also discounted at 15%. In cases of mortality, some hospitals will forego all their fees and charges, including hospital and diagnostic services. The cost of any additional medicine utilized is charged at (MRP = (100 - X %)) discount). Finally, a detailed bill is sent to PCHF at the time of discharge and has to be settled within 60 working days from the date of the invoice and a maximum of Rs. 5 million outstanding. Thus, through referrals, IOCs also allow distribution of patient volume, an increase in number of patients treated because of an alternative revenue source, and overcoming low resources such as surgical equipment, medicines, and healthcare professionals. This partnership also offers an advantage for stakeholders because all patients stay in the network of the IOC.

Partnerships with NGOs in Pakistan

At present, PCHF has IOCs with two CHD NGOs. These include Transparent Hands and AKU patient Behbud Society. In this partnership, 50% of the cost is borne by the IOC NGO and 50% by PCHF. After the patient is discharged from the hospital, PCHF collects the payment from the NGO through which the patient was referred to PCHF, and collectively reimburses the hospital where the patient was treated. The amount of the payment depends on PCHF's financial evaluation, and the amount contributed by the patient.

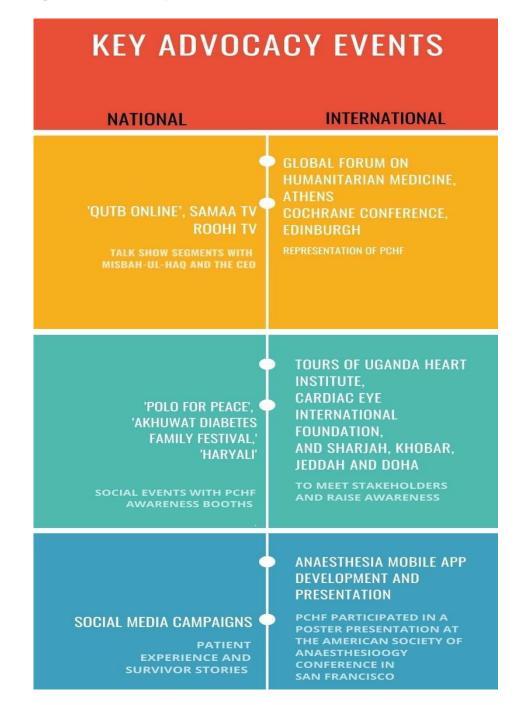
Partnerships with international NGOs

Gift of life international is an organization that aims to build sustainable pediatric cardiac programs in LMICS through partnerships. In June 2017, its CEO visited PCHF and formed an IOC. This included supporting 100 surgeries of CHD patients through funding, helping with the cost of medical disposables at PCHF's interim setup at the time and



Partnerships for awareness and advocacy

The Global Alliance for Rheumatic and Congenital Hearts (Global ARCH) is an alliance to address childhood-onset heart disease. PCHF is a member of this alliance. Through this alliance, in 2017, PCHF participated in the first International Congenital Heart Leadership Summit (ICHLS) by Global ARCH. This brought together 30 CHD and RHD leaders representing 21 countries on six continents. Now, PCHF's CEO is a board member of Global ARCH. There are a series of global webinars and CHD advocacy events that PCHF participates in through this alliance.



Partnerships for quality improvement

International Quality Improvement Collaborative (IQIC). PCHF is one of only three institutes in Pakistan to be recognized by IQIC. International consortium for Health outcomes measurement (ICHOM). ICHOM standard sets include valuebased healthcare by defining global standard sets for better outcome measures and reporting. PCHF is a contributor for ICHOM's CHD standard set.

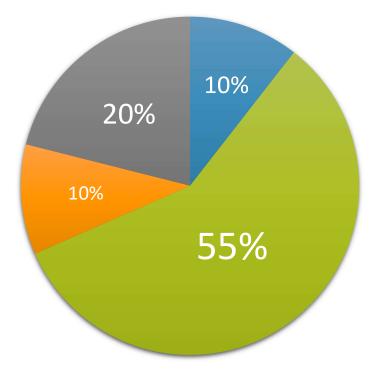
Partnerships for hospital construction

To bring sustainability for complex care in Pakistan, PCHF's goal is to establish a center of excellence. This will be the first tertiary care hospital in Pakistan exclusive to pediatric cardiology. For this purpose, PCHF has established an IOC with UOLTH to establish Children's Heart Hospital and Research Institute (CHRRI).

Partnerships for financing

Currently, the financing model is not-for-profit. However, this model will be adjusted to non-profit for sustainability in the future. Funds are generated from both national and international donors. National donors include corporate organizations and individuals. International donors include PCHF's sister organization, PCHFNA and individuals.

Figure 2: Sources Of Revenue For Patient Treatment



■ PCHF equity fund ■ Zakat ■ Donations ■ Patient contribution

Fund utilization model

Cost sharing between hospitals and PCHF is not in the form of co-payments or fee for service. As the types of costs shared are negotiated on a case-bycase basis and the percentage that is paid by the patient. Surgeons and all medical staff are reimbursed in full on a successful case and partially in the event of a mortality. IOC hospitals continue to receive an estimated 33% hospital service charge. At present, 20% of patients provide full expense, 20% partial and 60% are indigenous who provide no cost.

Patient Treatment

An equity fund formed by the board of directors is used to fulfill all administrative costs. 55% of funds for patient treatment are collected from Zakat. Zakat is the annual obligatory Islamic tax. Therefore, this is PCHF's primary source of revenue. The secondary part of patient treatment comes from donations.

Hospital Construction

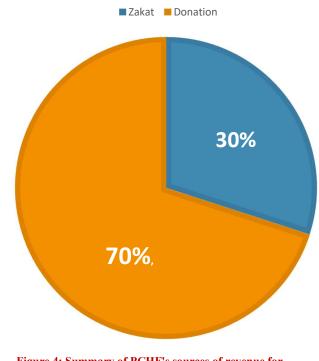
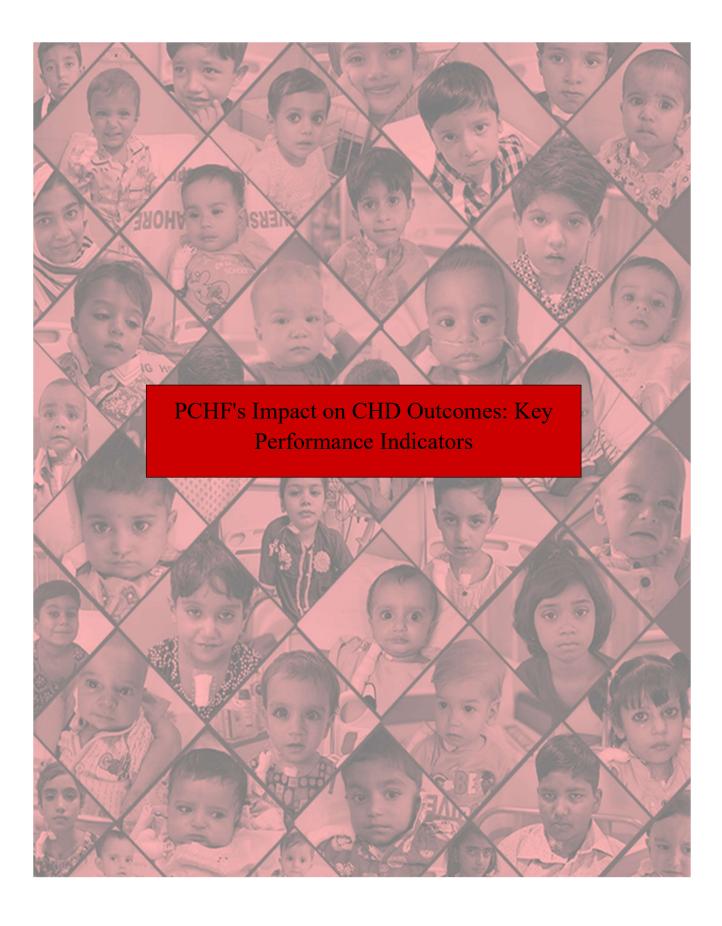


Figure 4: Summary of PCHF's sources of revenue for hospital construction

Partnerships for capacity building

PCHF has signed MOUs with one NGO and ten tertiary care hospitals for to train health professionals in innovative CHD management techniques. Medical missions are arranged for an average of 3 days. The objective is to increase resilience and skill amongst the health professionals to tackle low resources in the country.







PATIENT DEMOGRAPHIC DATA AND DISCUSSION

FIGURE 6: TOTAL NUMBER OF CHD SURGERIES AND INTERVENTIONS

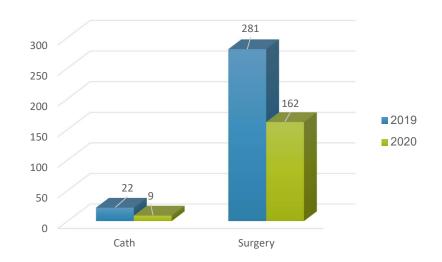


FIGURE 7: TOTAL NUMBER OF TYPE OF CARDIAC SURGERY

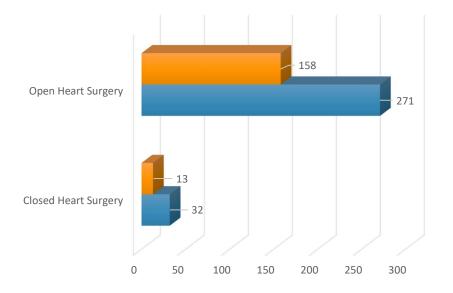


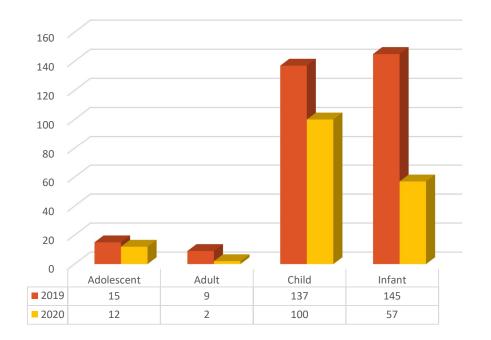


TABLE 2: TABULATED TOTAL NUMBER OF SURGERIES AND INTERVENTIONS DONE BY EACH SURGEON*

*The numbers do not reflect total physician/surgeon case volumes and/or outcomes

NAME OF SURGEON							
	Surgeon 1	Surgeon 2	Surgeon 3	Surgeon 4	Surgeon 5		
2019	1	134	20	18	2		
2020	1	72	0	19	0		
	Surgeon 6	Surgeon 7	Surgeon 8	Surgeon 9	Surgeon 10		
2019	5	8	8	13	86		
2020	0	2	1	7	69		
	Surgeon 11	Surgeon 12	Surgeon 13				
2019	1	1	2				
2020	0	0	0				

FIGURE 8: DISTRUBUTION OF OPERATED CASES BY AGE GROUP





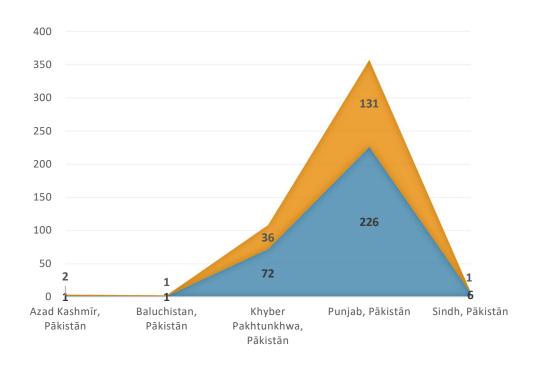
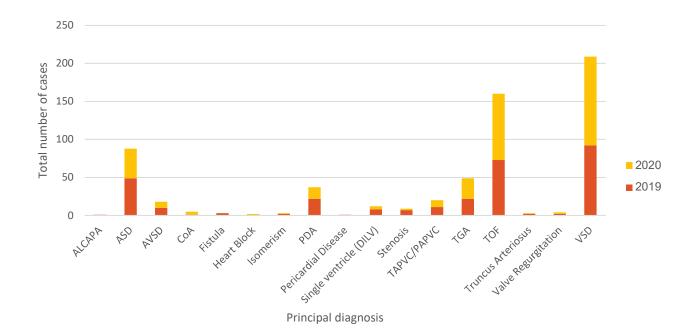


FIGURE 9: DISTRIBUTION OF CASES BY PROVINCE

FIGURE 10: DISTRIBUTION OF DIAGNOSES





KEY FINDINGS

- The highest number of surgeries and interventions supported by PCHF were carried out in Ittefaq Hospital, Lahore.
- The number of VSD closures with a Dacron patch was reported to be 178. Making it the most prevalent CHD and treatment modality in the financial year 2020.
- ALCAPA repair was the least treatment modality with one reported case.
- There were only 34 catheterizations in total. The reported number was markedly less as opposed to that of openheart surgeries possibly because of the diverse case-spectrum being presented.
- Age distribution of patients shows more infants treated in 2019 with a drastic reduction in the infant age group and increase in children age group in 2020.
- According to Rashid et al (2016), there is majority of late presentation of CHD patients in LMICs. Such delays in late presentation and treatment results in suboptimal management and poor outcomes as complications may have already set in [27].
- The relationship of age and disease presentation is an important area of future research identified through PCHF's KPI report.



DATA AND DISCUSSION ON PATIENT MORTALITY AND CASE COMPLEXITY

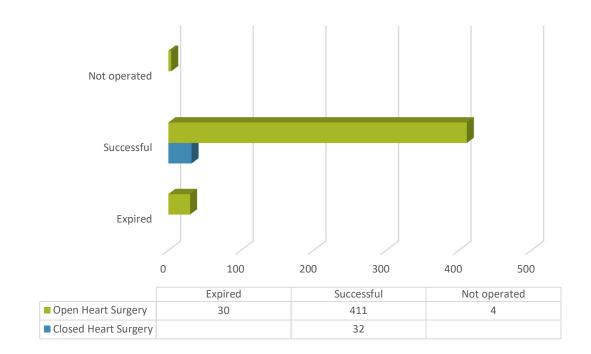


FIGURE 11: TOTAL NUMBER OF SUCCESSFUL AND UNSUCCESSFUL SURGERIES

KEY FINDINGS

- The total number of successful surgeries is 432 and expirations is 34.
- The Risk Adjustment for Congenital Heart Surgery (RACHS-1) scoring was done using standardized scores that are applied in the STS Congenital Heart Surgery Database and the EACTS Congenital Heart Surgery Database [23].
- A standardized scoring system was used because variables such as morbidity, readmissions, length of hospital stay, length of CICU stay, length of ventilation, were not included in the scope of this review.
- The RACHS-1 scoring was recorded for each individual partner hospital.
- PCHF's unadjusted mortality rate for the financial year 2020 is 6.8%.

Name of IOC Hospital	Total Number of CHD Treatments	Number of Catheterizations	RACHS-1 Score 1	RACHS-1 Score 2	RACHS-1 Score 3	RACHS-1 Score 4	RACHS-1 Score5	RACHS-1 Score6	Number of Deaths
AFIC Rawalpindi	12	-	1	7	4	-	-	-	0
AKU Hospital Karachi	5	2	-	2	1	-	-	-	2
Children Hospital Lahore	1	-	-	-	-	-	-	1	0
Children Hospital Multan	5		3	2	-	-	-	-	0
CMH Lahore	1	-	1	-	-	-	-	-	0
Hameed Latif Hospital	2	1	1	-	-	-	-	-	0
Ittefaq Hospital	319	26	17	188	64	24	-	-	29
Liaquat National Hospital Karachi	2	1	1	-	-	-	-	-	0
MIC Multan	15	3	4	8	-	-	-	-	0
PCHF-ULTH Cardiac Care Unit Lahore	136	1	59	71	4	-	-	-	3
TOTAL	498	34	87	278	73	24	0	1	34

TABLE 3: SUMMARY OF PCHF IOC HOSPITALS, COMPLEXITY AND OBSERVED DEATHS



KEY FINDINGS

PCHF has conducted a total of 498 CHD surgeries and interventions. Individual, IOC hospital-based numbers are shown in table 14.
RACHS-2 was the most common complexity score. With 188 RACHS-2 cases conducted in Ittefaq Hospital.

No RACHS-5 procedure was done.

There was only one RACHS-6 procedure, making it the least recorded number.
Out of the 10 IOC hospitals, 3 had recorded mortalities. These included Ittefaq Hospital, PCHF-ULTH Cardiac Care Unit and Aga Khan University Hospital.
The observed number of deaths was highest in Ittefaq Hospital, with 29, followed by 3 in PCHF-ULTH Cardiac Care Unit and 2 in Aga Khan University Hospital.

TABLE 4: MORTALITY RATIOS ACCORDING TO RACHS-1 COMPLEXITY SCORE				
RACHS-1 SCORE	RATE (%)	DEATHS (N (%))		
1	87 (18.9)	3 (3.4)		
2	278 (60.0)	15 (5.4)		
3	73 (15.7)	10 (13.7)		
4	24 (5.2)	6 (25)		
5	-	-		
6	1	O (0)		
TOTAL	463	34		

KEY FINIDINGS

 The highest number of mortalities are recorded for RACHS-4 cases and the least for RACHS-1 cases.
 According to this data set, the mortality ratio is increasing

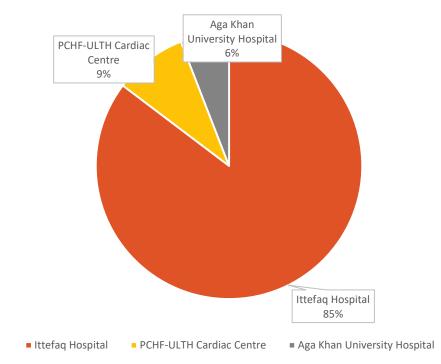


FIGURE 12: INTERINSTITUTIONAL COMPARISON OF UNADJUSTED MORTALITY RATE

• Risk-adjusted mortality ratios will have to be calculated to critically analyze the incidence and prevalence of mortality ratios between individual IOCs with PCHF. It is excluded from this review, as it was not included in the inclusion criteria.

PCHF's Impact: Value-Based CHD Healthcare in Pakistan

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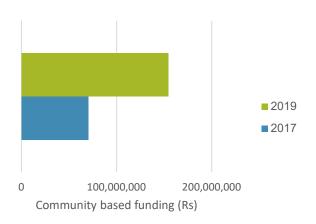
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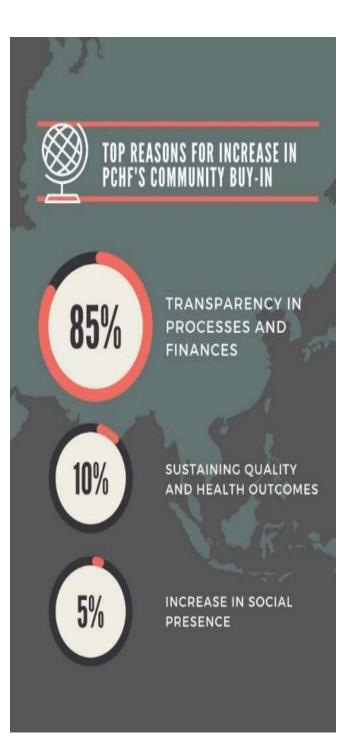
By increasing local ownership

PCHF's community buy in has increased from Rs. 70,264,206 in 2017 to Rs. 154,462,140 in 2019. This is a 37.5% increase in just two years. Therefore, by continuing to focus on patient centered care, relying on community engagement will make scaling up and sustainability more feasible. PCHF also integrates value in the system by serving the community through reducing CHD based infant mortalities. As Pakistan already has a high IMR. Improving CHD based health outcomes will inadvertently improve the IMR. A reduction in IMR will bring Pakistan closer to her SDGs (Sustainable Development Goals). This could encourage a government stake in the CHD mission.



By providing sustainability

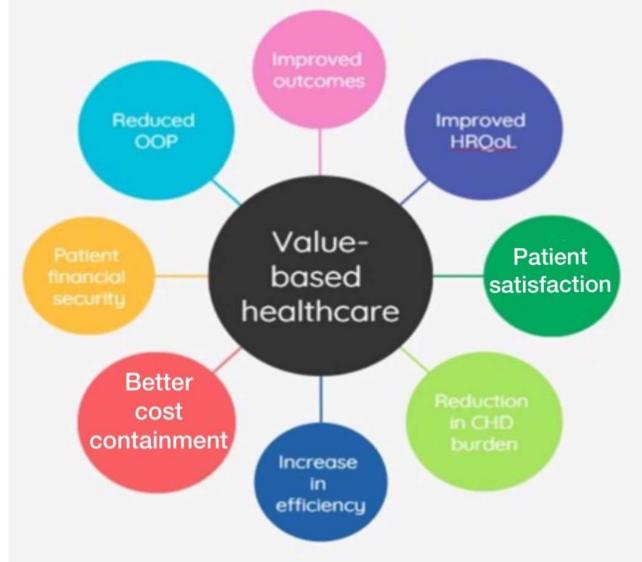
PCHF's Children's Heart Hospital and Research Institute (CHHRI) will bring sustainability to the cause by providing a permanent solution to a consistent problem. CHHRI will be the first exclusive tertiary care hospital in Pakistan wholly dedicated to pediatric CHDs.



PC¦iF

By ensuring quality

PCHF has started follow up for Quality of Patient Life calls to its patients from March 2020. 1785 follow up calls have been made thus far. This includes calls to registered patients. Perioperative and postoperative data is collected from patients based on IQIC protocols. At present, PCHF has an adjusted mortality rate of around 1% at the site where they are implementing IQIC protocols. Apart from this, PCHF attends IQIC webinars on improving quality, such as, reducing surgical site infections, building a culture of teamwork and effective communication, Child Hospital Early Warning System and trying to implement these to improve its quality.





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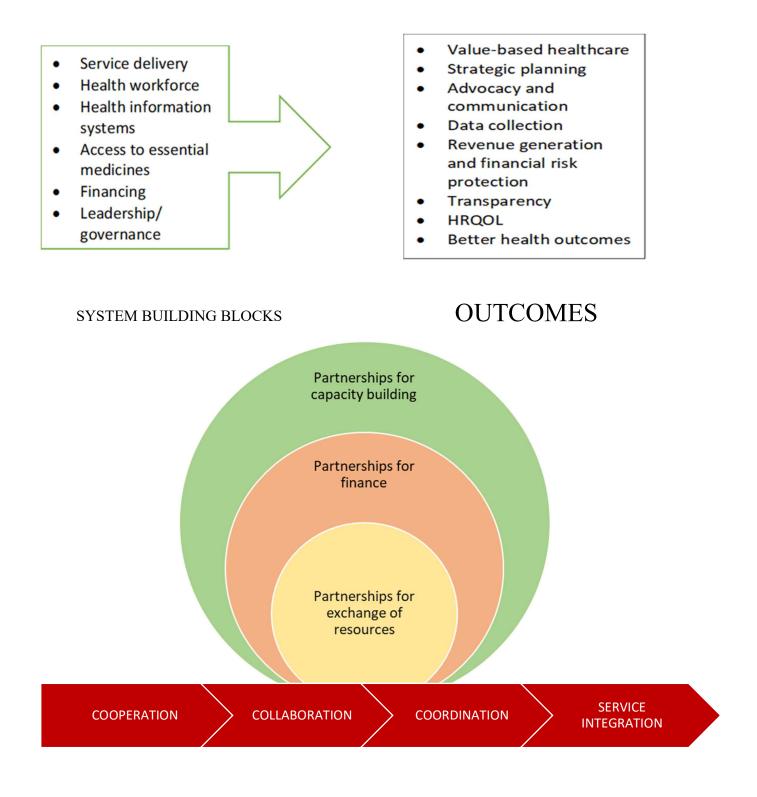
For infrastructure and policy

Replicability of PCHF's cost sharing model and IOC framework by other CHD based organizations in the country would increase the impact of integration of the value-based system in the country. This would also lay the groundwork for a government stake in the CHD mission in the country and policy change for NCDs and CHDs in the country. These policies can assist in the prevention and better antenatal detection of CHDs in Pakistan. An area that requires immediate attention. It is proposed that CHD treatment will be easier to finance and manage in Pakistan. Maintenance of quality standards can be improved, which will result in better health outcomes. There will also be more accountability and transparency in the system. Ultimately, sustainability of better CHD treatment would provide a directive for revision of existing CHD healthcare policies and budgeting by the government. Including a revision of policies for a more equitable access to healthcare. A government

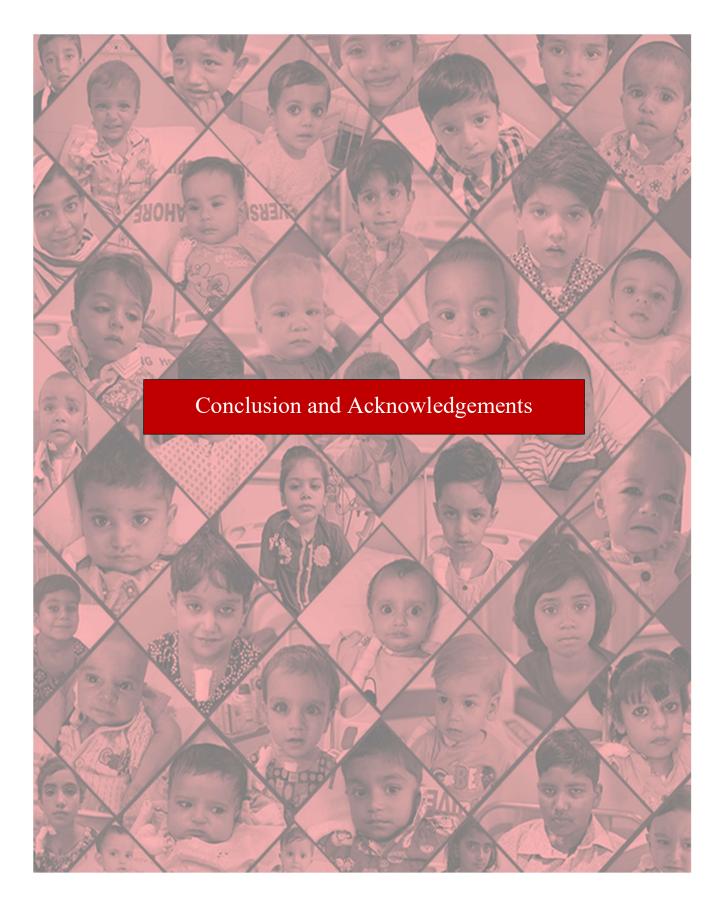
stake would allow for the retention of stakeholders and acquisition of new ones.

For health education and promotion Policy makers need to understand the drivers of the health seeking behavior of the population. A concerted effort is required for designing behavioral health promotion campaigns through inter-sectoral collaboration focusing more on disadvantaged segments of the population. Better social arrangements can help make the health system more responsive.

For research This review has explored several integral research avenues. These include health outcome measures, quality measures and performance indicators. Substantial improvement in CHD treatment performance can only be possible if these key areas are addressed through evidencebased practices. There is also a need for improved data collection and reporting. **Theoretical framework for CHD health system strengthening in Pakistan**To present a framework for CHD health system strengthening in Pakistan, the WHO framework and PCHF's cost sharing model were collated. 8 outcomes from PCHF's cost sharing model were established through this report.







Pakistan's health sector consists of an existing tertiary care infrastructure, resources, and skilled professionals for addressing CHDs. Keeping the limitation of resources in mind, the idea is to build on this existing CHD platform for maximum efficiency within this sector. In the financial year 2020, CHD based NGOs, such as PCHF, have shown a considerable amount of success in providing free treatment for CHDs. According to the data, PCHF has demonstrated the maximum number of patient turnover, lower average cost per treatment, and potential health outcome predictors were reported. These reported outcomes indicate a ramification of the innovative IOC framework PCHF incorporates in its cost sharing model. Partnering with other NGOs has also led to an increase in treatment numbers. Albeit, miniscule. Therefore, a scaling up of this framework has potential for a more substantial impact. In conclusion, the IOCs for CHD healthcare proposes a holistic approach for tackling CHDs in Pakistan. By combating socioeconomic disparity, low resources, and disease burden through an integrated approach. CHD health workers are currently facing similar challenges in the health system and IOCs provide health-system and morale strengthening in the

system. Through IOCs, PCHF has also changed the dynamic of philanthropic work for CHDs in Pakistan. By introducing value-based healthcare, IQIC regulated quality treatments and processes and health related quality of life indicators for patients. PCHF would like to thank the health-based NGOs included in this brief for their cooperation.

We are thankful for the transparent exchange of data with PCHF. Data was collected through a telephone survey.

We are also obliged to our patients, their families, donors, and volunteers.



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