HARVARD MEDICAL SCHOOL
BRIGHAM AND WOMEN'S HOSPITAL

The Indus Hospital: Building Surgical Capacity in Pakistan

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> "Working in the government medical system, most of my energy was being misdirected, and life is too short. So I said, 'Let's build a hospital where our energies are better utilized.'"
>
> *Dr. Abdul Bari Khan, CEO of Indus Hospital*

The Indus Hospital opened in Karachi, Pakistan in 2007 with a mission of providing exceptional, high-quality surgical care at no cost to the city's poor residents.

Dr. Abdul Bari Khan, after a long career as a cardiac surgeon in a public sector hospital, had tired of wrestling with government bureaucracy and the slow pace of change. He and his cofounders, also surgeons and an anesthesiologist, had witnessed the immense unmet burden of surgical disease and seen the barrier surgical costs created. They felt they could make a large impact by providing free, high quality surgical care with philanthropic support.

Most people believed that free care would only be available for a year before Indus would be forced to collect fees to keep quality operations going. Seven years later, in 2014, the hospital was still providing free care, maintaining its quality, and caring for 1000 patients daily. Bed occupancy ran at 91%, and there was a two-year wait for some elective procedures. The government had approached Indus about partnering for scale up. Bari had to figure out what it would take to scale up the quality care and whether the partnership would be workable.

Exhibit 1: **Map of Pakistan**
Source: Open-source map.

Overview of Pakistan

The Islamic Republic of Pakistan in South Asia (see Exhibit 1 for map of Pakistan) is divided into five provinces: the Khyber Pakhtunkhwa, Punjab, Sindh, Baluchistan, and Gilgit Baltistan. The modern state of Pakistan developed in 1947 following independence from British rule and sub partitioning from the Indian subcontinent. Relations between Pakistan, primarily Muslim, and India, primarily Hindu, remained tense, and border disputes led to Pakistan-Indian wars. Modern-day Bangladesh seceded from Pakistan in 1971 with Indian support. Pakistan's government underwent alternating periods of civilian and military rule, marked by high levels of corruption, inefficiency, and instability.[1] Pakistan's internal political disputes led to low levels of foreign investment and underdevelopment.

Pakistan in 2014 was a lower-middle-income country marked by high rates of poverty (see Exhibit 2 for basic demographic statistics). It was the seventh most populous country in the world. Two-thirds of people lived in rural areas, which tended to be dominated by a few wealthy landlords. The nation lagged behind other South Asian

List of Abbreviations

DOTS	directly observed therapy short course
GDP	gross domestic product
ICU	intensive care unit
IRD	Interactive Research and Development
MDR-TB	multi-drug resistant tuberculosis
MOH	Ministry of Health
PPP	purchasing power parity
TB	tuberculosis
USD	United States' dollars

countries in nutrition, literacy, gender equity, and access to health facilities. In 2009 only half of the 19 million primary school–aged children were enrolled in school.[2] With over 23·5 million people in the metro area, Karachi is the largest city and national economic hub. In the late 2000s, the main economic drivers were services (54·5%), agriculture (20%), and industry (23·6%).[3] Between 2001 and 2007, Pakistan's economy grew robustly and poverty decreased. In 2007 the onset of a global economic crisis coupled with the fallout from domestic political disruptions slowed economic growth. Sharp oil and food price increases exacerbated the economic downturn.[4,3]

Health in Pakistan

In the twenty-first century, Pakistan faced a double burden—high rates of infectious diseases and the increasing prevalence of noncommunicable diseases (see Exhibit 3 for top 10 causes of mortality and morbidity).[5] The country also had high birth rates and infant and maternal mortality rates (see Exhibit 4 for more health indicators). Less than one-third of pregnant women received regular antenatal care, and 40% gave birth at health facilities.[2] Pakistan lacked universal vaccination coverage[A,6] and more than 25% of children—mostly in rural areas—were chronically malnourished and lacked safe water and household sanitation.[2]

Like in many low- and middle-income countries, access to and affordability of surgical care in Pakistan was hard to attain for the majority of people. Patients from rural areas traveled long distances to seek surgical care, incurring a financial burden even if free surgical care was available.[7] One study found that people in urban areas were nearly twice as likely to receive an abdominal operation as compared to those living in rural areas, regardless of economic status.[8] Prices for surgical care far exceeded what the average Pakistani could afford. For example, an uncomplicated hernia repair cost between USD 211 and USD 740 while the minimum monthly wage in 2013 was USD 97.[9] Data on the quality of surgical care in Pakistan were practically non-existent.[10] Given the lack of regulation in the health care sector combined with the population's low literacy and education levels, many patients were unable to compare quality between facilities or understand what they were purchasing; despite this, patients often sold personal assets or took loans from family and friends to pay for care.[11]

Health Care Workforce

Pakistan had a health care workforce shortage, especially among nurses. The majority of health services and personnel were in urban areas. Private traditional healers were the main source of care in rural areas.[12] The government paid physicians about USD 350–USD 400 per month. Private sector doctors could earn up to four times as much.[13] About 20% of new Pakistani medical graduates emigrated annually to seek higher salaries.[14]

Indicator		Year
UN Human Development Index ranking	146 (out of 187)	2013
Population	182 million	2013
Urban population (%)	38	2013
Drinking water coverage (%)	91	2012
Poverty rate (% living under USD 1.25 per day)	21.0	2008
Gini index	30.0	2004
GDP per capita in PPP (international dollars)	2,741	2012
GDP per capita (constant 2000 USD)	806	2013
Literacy (men/women/youth; %)	67/42/71	2011

Sources: Compiled by case writers using data from United Nations (UN), UNICEF, World Bank, and United Nations Educational, Scientific, and Cultural Organization (UNESCO).

Exhibit 2: **Basic Socioeconomic and Demographic Indicators**

Rank	Mortality	Morbidity/Disability
1	Diarrhea	Hypertension
2	Childhood lower respiratory infection	Injuries
3	Tuberculosis	Eye diseases
4	Rheumatic heart disease	Malnutrition
5	Chronic liver disease	Birth diseases
6	Congenital malformations	Congenital malformations
7	Birth diseases	Dental diseases
8	Ischemic heart disease	Ischemic heart disease
9	Child septicemia	Anemia (in women)
10	Other respiratory diseases	Mental retardation

Source: Hyder A. Applying Burden of Disease Methods in Developing Countries: A Case Study from Pakistan, American Journal of Public Health, August 2000, vol 90. No. 90.

Exhibit 3: **Top 10 Causes of Mortality and Morbidity in Pakistan, 2000**

Indicator		Year
Average life expectancy at birth (total/female/male)	66·4/67·3/65·6	2012
Maternal mortality ratio (per 100 000 live births)	170	2012
Under-five mortality rate (per 1000 live births)	86	2012
Infant mortality rate (per 1000 live births)	69	2011
Vaccination rates (% of DTP3 coverage)	72	2013
Undernourished (%)	19.9	2011
Adult (15–49 years) HIV prevalence %	0.1	2012
HIV antiretroviral therapy coverage (%)	14	2012
Tuberculosis prevalence (per 100,000)	376	2012
DOTS coverage (%)	100	2006
Malaria cases (per 1,000)	1.9	2012
Expenditure on health as % of GDP expenditure	2·68	2012
Government spending on health as % of total government spending	4·7	2012
Government health spending as % of total health spending	36·9	2012
Total health expenditure per capita (international dollar rate)	77·3	2012
Physician density (per 10 000)	8·3	2012
Nursing and midwifery density (per 10 000)	5·7	2012
Number of hospital beds (per 10 000)	6	2010

Sources: Compiled by case writers using data from United Nations (UN), UNICEF, World Bank, and United Nations Educational, Scientific, and Cultural Organization (UNESCO).

Exhibit 4: **Health System and Epidemiologic Indicators**

Infrastructure Type	Number
Basic health units	4872
Dispensaries	4916
Rural health centers	595
Hospitals	965

Source: The Global Fund to Fight AIDS, Tuberculosis and Malaria Round 9 Proposal Form, 2009.

Exhibit 5a: **Public Health Sector Infrastructure in Pakistan, 2009**

Infrastructure Type	Number
General practitioners	20,000
Laboratories	420
Dispensaries	340
Maternal homes	300
Small hospitals	520
Urban tertiary hospitals	6

Source: Shah GH, Ejaz N. The Role of NGOs in Community Health in Pakistan—NGO Pulse Report, 2005.

Exhibit 5b: **Estimated Private Health Sector Infrastructure in Pakistan, 2004**

Public Health System

Pakistan inherited a centralized health care system from the British. The Ministry of Health (MOH) was responsible for providing free health services, including hospital care, to all citizens.[15] Ineffective implementation led to wasted resources and poor morale among civil servants described as "institutional malaise."[16,17] Starting in 2001, the government decentralized planning and administrative powers to address criticism about the failing system.[18]

Most of Pakistan's public health care infrastructure was created in the 1970s. Village basic health units were the first level of care and were understaffed and poorly equipped. The next level of care, rural health centers, had 30-member staffs led by medical officers to serve 50 000 to 100 000 people. The centers often were open only three to five hours of the scheduled 24–7 coverage. They offered X-ray, basic laboratory test, and minor surgery facilities. Municipal-level hospitals typically had 40 to 60 beds and offered secondary services, including obstetrics, pediatrics, and general surgery to a catchment area of 100 000 to 300 000 people. District hospitals had about 100 beds and offered acute care and emergency services to one to two million people. Major cities had state-run tertiary teaching hospitals that offered subspecialty care (see Exhibits 5a and 5b for numbers of public and private health care facilities).[19]

Surveys showed less than 30% of people used government health care services.[19] While public-sector health services were supposed to be free, patients often had to pay user fees and buy their own drugs and supplies.[20] Additionally, there were widespread accusations of corruption[21] and care quality was not monitored systematically.[15] As a former Pakistan Medical Association president explained, "A majority of the basic and rural health units in the country are nonfunctional mainly because of the very low priority status the government accords to public health. In a country where the government is unable to provide clean drinking water, it's difficult to talk of quality health care."[22] Public-private partnerships to boost health services were increasingly common throughout Pakistan.[19] The Civil Hospital, a 1900-bed tertiary teaching hospital in central Karachi, for example, relied substantially on private-sector support. Much of the 100-year-old crumbling structure had dim, dirty hallways, crowded wards, broken and outdated equipment, and an overworked, underpaid staff, but eight units privately managed and funded were strikingly clean, organized, and well stocked with modern, functioning equipment.

The Private Health Sector

Pakistan's private health care sector—including traditional healers, for-profit clinics, high-tech specialty hospitals, and not-for-profit clinics and hospitals—accounted for at least 70% of health care services in the country among the poor and wealthy alike.[16,23] About 90% of private health care was funded through individual out-of-pocket payments.[24] The cost of care often pushed the poor deeper into poverty.[23] Most Pakistanis did not have insurance.[25]

Charity Medical Care

At least 1800 NGOs provided free or subsidized health care services in Pakistan.[19] *Zakat*, Muslim obligatory charity, and donations from wealthy Pakistanis financed numerous charity hospitals. Funding channeled through the Ministry of Zakat and a similar government department called Bait-Ul-Maal accounted for 0.32% of formal health financing in 2008.[23] Like most of the private sector, charity hospitals received minimal government oversight.

Typically, charity hospitals provided curative services for acute medical problems for a single medical condition or specialty. With a few exceptions, charity hospitals did not have reputations for providing high quality, state-of-the-art care. Over time, many charity hospitals closed or began charging patient fees to cover expenses.

The Indus Hospital

The Indus Hospital was a nonprofit, private charity hospital that opened in July 2007 to serve a catchment area of about 2·5 million people. The hospital was located in Korangi, a Karachi neighborhood where multi-generational families crammed into small flats stacked unevenly along the unpaved, narrow streets. The five-story, 150-bed Indus Hospital was one of the tallest buildings for miles. Indus' 20-acre campus also included a walk-in filter clinic, an open-air TB clinic, a pharmacy,

and a nursing school. The hospital ground floor included a reception area, a patient welfare office, a 10-bed emergency department, six outpatient clinic rooms, areas for X-ray, ultrasound, and blood drawing, and a blood bank. The first floor housed four operating theaters, a six-bed intensive care unit (ICU), a six-bed cardiac care unit, a cardiac catheterization lab, and an endoscopy suite. The second floor included a 10-bed dialysis center and a 41-bed men's inpatient ward. The 37-bed women's ward and a 27-bed pediatric ward were on the third floor. The fourth floor had the central laboratory, a biosafety level-three lab for highly infectious materials, conference rooms, administrative offices, and the Indus Hospital Research Center staff.

Background

In 2005, medical school colleagues—surgeons Dr. Bari, Dr. Zafar Zaidi, and Dr. Akhtar Aziz and anesthesiologist Dr. Muhammad Chinoy—who had studied together in the 1980s at Civil Hospital in Karachi, reunited. They had all trained in the United States and United Kingdom before returning to Pakistan to build successful practices. Driven by a philosophy that all patients had a right to high-quality care, regardless of ability to pay, the group conceived of a surgical facility that would provide free, high-quality surgical care to Karachi's poor. "I was very clear from day one that the hospital had to be free," Bari said. "The people we see are the poorest of the poor. I know these patients from my work in the public sector." One colleague explained:

> The reason behind this emphasis was clear from the beginning: surgical care is an upfront, often one-time cost. Most people are not able to arrange a large amount in one go. Hence surgical care tends to get more and more neglected or delayed. As opposed to this, if a patient has hypertension or diabetes, they may well be able to get enough funds to do a clinic visit and pay for some medicines on a recurring basis. While the cumulative costs may be the same, it is the one time big hit that our population cannot take. Therefore the emphasis has always been on high cost, resource intensive care areas—surgery, dialysis, ICU care.

The founders believed that their commitment to quality would set them apart from other charity hospitals and attract donors (see Exhibit 6 for the hospital's mission and vision statements). The chairman of the board of directors wrote in a hospital newsletter, "In my eyes, it is not enough to help provide health care to the poor. It is essential that this health care is of the same quality that we would want for ourselves and our family. It is indispensible to keep in mind that by giving to the poor, we must add to their dignity and not take it away from them."

They successfully attracted the financial support from wealthy Pakistani donors locally and abroad. The hospital's nine-member board of directors comprised largely of well-connected Karachi businessmen. A Pakistani industrialist provided seed funding of USD 2 million for the operating rooms. Another USD 3 million was raised to support the initial construction.

Two years after the initial conception, Indus hospital saw its first patient in 2007. The founding physicians worked for free for the first six months.

Exhibit 6: **Indus Hospital Mission and Vision Statements**

Mission

To provide health and excellence driven comprehensive unconditional medical services to the humanity—free of charge only to please Allah SWT.

Vision

The Indus Hospital is a state of the art tertiary care center accessible to the public free of charge. Local and expatriate professionals provide specialized medical care in accordance with Good Clinical Practices, with an emphasis on innovation and research. The tertiary care facilities at the hospital will be complemented by community outreach programs focused on prevention and early detection of disease, encouraging community involvement and ownership.

Source: The Indus Hospital.

Planning and Building

Indus invested in the design and building of a comprehensive, custom-built electronic medical information system that linked all hospital operations. Staff signed into the medical information system with a biometric scan of their hands, and all hospital activity was tracked on a single system. This early commitment to electronic data systems proved essential to supporting the hospital's operations, quality monitoring and scalability. It also proved to be good public relations; the media called Indus "Pakistan's first paperless hospital."

Indus leaders never created a detailed, written strategic growth plan (see Exhibit 7 for Indus Hospital patient volume over time). They decided what services to add based on whether the services fit their broad vision, funding and staffing were available, and there was sufficient operational capacity. The hospital's initial services reflected the founding physicians' specialties: cardiac, orthopedic, and urological surgery supported by anesthesiology. The hospital focused on expensive procedures that patients would not be able to pay for out of pocket. Indus did not offer obstetric and gynecological services, fearing an overwhelming demand. The hospital added pediatric and adult general surgery and nephrology after recruiting specialists.

With donor funding, the hospital opened a 10-bed dialysis center, recruited a gastrointestinal specialist, opened an endoscopy suite, and offered ophthalmology services. Indus also provided comprehensive tuberculosis (TB) treatment, including second-line drugs for treating multi-drug resistant TB (MDR-TB)

Fiscal Year	Filter Clinic	Outpatient Services			Inpatient	Total
		Consultant Clinic	Emergency	Total		
2007	23 517	22 903	1508	46 420 (47 928)	2134	50 062
2008	59 669	52 236	25 280	111 905 (137 185)	6617	143 802
2009	83 320	76 853	63 908	160 173 (224 081)	10 041	234 122
2010	77 889	90 026	124 808	167 915 (292 723)	10 541	303 264
2011	82 972	111 048	148 651	194 020 (342 671)	10 679	353 350
2012	77 033	121 700	164 264	198 733 (362 997)	12 160	375 157
2013	74 539	117 249	177 328	191 788 (369 116)	12 832	381 948
2014 (4 months)	28 973	47 576	53 311	76 549 (129 860)	4 151	134 011
	23 517	22 903	1 508	46 420 (47 928)	69 155	1 975 716

Fiscal Year	Diagnostic Tests		
	Laboratory	Radiology	Total
2007	4231	1382	5613
2008	66 549	13 839	80 388
2009	65 006	12 732	77 738
2010	183 093	29 364	212 457
2011	237 287	47 287	284 574
2012	254 259	57 070	311 329
2013	233 524	56 184	289 708
2014 (through August)	2 340 924	117 060	2 457 984
	3 384 873	334 918	3 719 791

Department	Surgical Procedures						
	2007–2008	2008–2009	2009–2010	2010–2011	2011–2012	Total	%
Orthopedic	509	1641	2384	2530	2542	9606	29%
General surgery (adult)	373	890	1207	1474	1424	5368	16%
Urology (adult)	284	758	1031	998	1117	4188	12%
Cardiology*	3	600	1202	1096	1270	4171	12%
General surgery (pediatric)	160	443	674	764	847	2888	9%
ENT	230	406	442	304	382	1764	5%
Urology (pediatric)	142	180	200	350	390	1262	4%
Gastroenterology (endoscopy and others)	0	0	30	673	519	1222	4%
Nephrology(lithotripsy ando thers)	122	276	241	168	322	1129	3%
Ophthalmology	0	0	220	348	342	910	2%
Cardiothoracic surgery	5	67	170	135	129	506	1%
Plastic surgery	0	33	158	118	194	503	1%
Others	10	53	13	13	0	89	<1%
Total	1838	5347	7972	8971	9478	33 606	100%

*Includes angiography, angioplasty, and other cardiac catheter lab procedures. Source: The Indus Hospital.

Exhibit 7: **Volume of Patient Care at the Indus Hospital over Time**

and a high-tech laboratory for diagnosing MDR-TB. One leader explained, "The non-surgical teams developed in the initial phase as a means of providing care for surgical patients—for example if a diabetic was undergoing a hip replacement, the comorbid condition needed to be dealt with. Over time, they have become strong departments in their own right."

While donors offered funding for mental health services, a neurology department, and expensive diagnostic machines, such as CT and PET scanners, the leaders declined. Bari explained, "We want to grow fast to meet the needs of the community, but we have to balance growth with our commitment to quality."

Patient Services

The first 300 patients to arrive at the outpatient "filter" clinic each day received tokens guaranteeing an appointment that day. Patients began lining up as early as 5 a.m. While they waited, clinic staff announced the services the hospital did not offer, including maternal care, so patients needing those services would seek care elsewhere. After checking in, patients often waited up to six hours to be assessed by a doctor.

The outpatient clinic doctors included young medical officers and pediatricians. Their job was to determine which patients could be treated in the clinic and which needed more specialized diagnosis or treatment. Training the medical officers to make high quality referrals to the surgeons based on effective outpatient workups was an ongoing challenge when patient volume was so high. Nine medical officers each saw about 30 to 40 patients per day in the filter clinic.

Patients could be admitted to the hospital from the outpatient filter clinic, hospital consultant, or emergency department. New patients received a unique patient identification number connected to their address or mobile phone number, an electronic medical record, and a white card listing their name, age, and patient ID number. This card became their passport within the hospital.

All patient tests, such as X-rays, blood analyses, or urine cultures, were ordered electronically and performed at the Indus laboratory. Doctors and nurses rounded with mobile computers and entered patient information directly into the electronic system. This real-time tracking allowed physicians to receive results instantly via cell-phone text message. Legal consent forms, surgical checklists, outpatient prescriptions, and patient discharge summaries were the only paper forms.

All care within the hospital was provided at no cost to all patients. Zaidi emphasized that there were "no cash counters in Indus Hospital." Patients did have to purchase outpatient prescriptions at local drug shops.

Some patients, particularly those who had traveled from far away and did not receive an appointment, complained about the long waits in the filter clinic. When the hospital was full, which was often, patients had to go to another free hospital and wait again. Many patients reported being grateful for the free care and fair processes through which it was provided (see Exhibit 8 for patient profiles).

Hospital Volume

Without any formal marketing campaigns, patient volume increased rapidly, particularly in the emergency

department and outpatient clinics. In roughly eight years, Indus had seen more than 1 million patients in the clinics and emergency department, and provided nearly 4 million diagnostic tests.

The exponential growth in emergency department patients in particular overwhelmed the hospital. Doctors in the 24-hour, 10-bed emergency department saw more than 400 patients per day. The waiting area overflowed into the main corridor. Commonly, patients came via a charity ambulance or private rickshaw after dog bites or motor vehicle accidents; or they arrived with other maladies caused by the poor local standard of living. To maximize flow through its emergency department and operating rooms, Indus hired part-time orthopedic surgeons to operate on trauma cases in the evenings after the elective cases finished.

Of the 40 012 inpatients Indus treated free of cost between 2007 and 2012, 33 606 (84%) received surgical procedures. Surgical procedures increased five-fold from 1838 in 2007–2008 to 9478 in 2011–2012. Bed occupancy increased to 91% from 65% over the same period. The growth in patient demand exceeded the hospital's delivery capacity. The waiting times for elective joint replacement surgery extended to two and a half years; for cardiac angiography, the wait was two weeks.

The lack of available beds for pre-operative and post-operative patients led to underutilization of the operating theater, catheterization lab, and other hospital resources. In an effort to maximize use of these areas, the hospital tried to lower the average length of stay by increasing outpatient procedures.

Quality

Indus leaders reminded their board of directors and other stakeholders that the quality of the care set them apart from other charity hospitals. The chief anesthesiologist had his bypass surgery at Indus, and Bari's mother-in-law had a pacemaker insertion at Indus.[B] Tracking overall quality remained an ongoing struggle. While Indus collected significant data with its electronic system on volume, costs, and efficiency, drawing conclusions on patient health outcomes was more challenging and required significant research capacity. Indus lacked data on long-term patient health outcomes, such as patient follow-through on post-discharge instructions and patients' ability to purchase medications at home. Some interventions hospital leadership put in place to monitor service quality included a secret shopper program with volunteers acting as patients to test the system and report on their experience; putting managers on the hospital floors to improve patient flow and ease bottlenecks and solve; and empowering front-line staff to provide input and involving them in decisions.

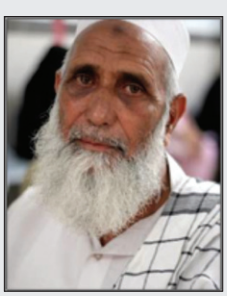
Hospital Staffing

Initially, Indus paid employees less than market rate, relying on the hospital's mission to attract staff.

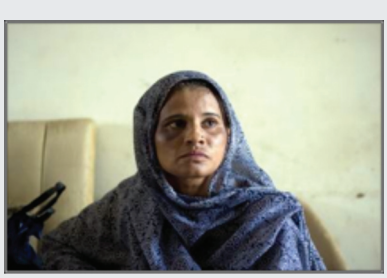
Exhibit 8: **Indus Hospital Patient Profiles**

Three-year-old Alex visited pediatric surgeon Lubna Samad after experiencing rectal bleeding for months. He received no diagnosis after a prior visit to a different hospital, where his parents spent USD 1·50 for a doctor consult and USD 14 for a stool test. Dr Samad was dismayed that the previous exams did not include a basic rectal exam. Samad felt a small polyp and scheduled a polyectomy and circumcision for the following week. Alex was Christian and did not qualify for *Zakat*, but the general donation fund paid for his care.

Muhamad Riaz, 64, was a fruit vendor who earned about USD 70 per month to support a household of four. He came to Indus for the second time in May 2011 for a rash on his stomach and complaints of liver problems. He left home at 4 a.m. to be in line by 5 a.m. to receive one of the 300 daily clinic appointments. Six hours later, he was still waiting. Riaz said he did not mind waiting because the care was free, the clinic was clean, and the staff was fair. The government hospitals had long waits, along with additional fees and patients bypassing the lines because they knew someone or paid a bribe. Private hospitals were too expensive, he said.



Rehmat Gul, 62, visited Indus for the first time in May 2011 seeking treatment for a kidney stone. He already had paid USD 7 to a private clinic for an ultrasound but couldn't afford treatment there. Gul said he judged the quality of medical care based on the cleanliness of the facilities and whether doctors and staff treated patients kindly. So far, Indus met his approval. No one had asked for a bribe, and the clinic was clean. Gul had to quit working as a security guard because of medical problems. Paksitan had no social safety net for the elderly or disabled, so he relied on his children for financial support.



Zubaida, 38, and her two teenage sons participated in Indus Hospital's community cohort study, which included a survey and basic health screenings to determine the local prevalence of noncommunicable diseases, such as diabetes, eye problems, and hepatitis. Zubaida lived in a conservative fishing community where the average monthly income was about USD 60. Most study participants signed their consent forms with a thumbprint because they were unable to read and write. Few women would show up to the health screenings unaccompanied by their husbands.

Najima was one of Indus' 150 MDR-TB patients. Halfway through her two-year treatment, Najima's symptoms were largely gone, and the 35-year-old mother of three was no longer confined to bed. Her treatment program included free medicine, twice-daily support from a treatment supporter, money for transportation to the hospital, and a monthly food supply for the family. Before Najima's family found Indus, her husband sold 25 buffalo—the family's entire wealth—to pay for her medical care. The treatment failed because Najima required expensive second-line drugs. Having nothing left, they moved from the village to Karachi.

Source: Photos and interviews collected by case writer Sarah Arnquist.

Leadership realized that recruiting and retaining qualified staff was the hospital's main growth-limiting factor. Indus raised nearly all staff salaries in 2010 after surveying the local market. Annual raises continued and proved beneficial in retaining and recruiting staff, although staff retention and recruitment, especially for surgeons, remained a persistent challenge. In 2013, staff received average raises of 8·5%, and in 2014, 9·5%.

In 2014, Indus employed 996 staff, of which 50 were surgeons and 40 surgical and anesthesia residents. About 26% of the 2013–2014 payroll of USD 4·9 million went toward surgeons. General surgeons and internists received close to market rate (monthly salary for a general surgeon was about USD 2120). Indus could not match market rate for specialists. Indus looked for specialists with "an innate desire to help those who cannot help themselves," Dr. Zaidi said. Indus also provided clinicians case diversity they may not see in private practice, which was intellectually attractive to many. To supplement their incomes, Indus encouraged physicians to participate in research grants and allowed them to work in private practice after 5 p.m.

Mansoor Khan was one physician who left a busy private orthopedic surgery practice to work at Indus. A month's salary at Indus was equivalent to what he earned previously performing just four knee replacements, eight hours of work. At Indus, he sometimes saw 40 patients per day. When feeling discouraged, he focused on his impact. "If you salvage one breadwinner," he said, "you look after the welfare of a dozen people."

Hospital administrators allowed Dr. Khan to perform a newer hip replacement technique—hip resurfacing—on select younger patients even though it cost four times as much as the old technology. He believed the cost was worth it: "If you do a traditional hip replacement in a young person whose joint was destroyed in a car accident or by TB and they go back to pushing a fruit cart or laying bricks and sleeping on the floor among 20 people and using a toilet in the ground, that joint is only going to last a couple of years."

News that a charity hospital performed the procedure shocked the Karachi medical community and made local headlines. Dr. Khan called this a "halo procedure" because it attracted the attention of current and future donors. He also believed the hospital's adoption of newer technologies also attracted trainees.

Training Programs

All Indus staff underwent training on standard operating procedures. The hospital developed a training program specifically for nurses. The best nurses were promoted to managers and instructors who trained and monitored the rest of the nursing staff. New nursing applicants had to pass two assessments before being hired on a conditional basis. These protocols were a starting point for quality and cost controls, a manager said, but the hospital still had much work to do. It was working toward developing ways to assess care quality and hold clinicians accountable.

In 2009 Indus received approval from the College of Physicians and Surgeons of Pakistan to train medical residents and accepted two residents each in urology, orthopedics, general surgery, anesthesia, and infectious diseases in 2010. Family medicine was added in fiscal year 2013–2014 in hopes of improving outpatient care. Leaders planned to build a medical school, nursing school, and paramedical training schools. They were also considering adding health informatics and a public health school. The goal was to receive government funding for these schools.

Indus' senior leaders wanted to identify rising stars and cultivate their commitment to the hospital philosophy, Bari said. "Our responsibility at Indus is to make a good system and develop future leaders to run it."

Research

Interactive Research and Development (IRD), a not-for-profit organization that secured international grants to carry out global health research in Pakistan, gained office space on the fourth floor of Indus Hospital. IRD and Indus partnered to create the Indus Hospital Research Center and carry out research on the local burden of disease and other projects, particularly around MDR-TB and childhood pneumonia. IRD was self-sufficient bringing in research funding. This research, in turn, influenced the hospitals' future plans and priority areas, including the expanded TB program and added pediatric wing. Zaidi commented on how the research expanded the clinicians' mindset: "My surgeon's perspective expanded from considering how one hospital could make a difference not just for individual patients but also potentially impact the health of an entire community."

	FY 2007–2008	2008–2009	2009–2010	2010–2011 (July-Mar)	2011–2012	Total
Inpatient	546 687	1 815 853	3 046 296	2 443 622	1 492 481	9 344 939
Outpatient	483 120	1 460 774	1 701 160	1 757 976		5 403 031
Total	1 029 807	3 276 626	4 747 456	4 201 598		13 255 488
% of total value of services rendered financed by Zakat	30	41	42	40	59	
% of total inpatient expenses financed by Zakat	46	64	69	74	76	

Source: The Indus Hospital.

Exhibit 9: **Value of Medical Care Provided to Patients at Indus Hospital in USD over Time**

	Indus Hospital (USD)	Average Prices at Karachi Commercial Hospitals* (USD)
Outpatient clinic visit	0·71	2·82
Consultant clinic visit	2·06	3·53
Dialysis per session cost	23·53	50·82
Lithotripsy	31·76	65·88
Single hip replacement	1029·41	1647·06
Single hernia repair	88·24	141·18
Average ward bed day cost	6·82	10·73
ICU day without ventilator	44·71	52·71

*Reflects published prices and not necessarily costs·

Exhibit 10a: **Comparison of Costs at Indus Hospital to Other Hospitals**

Description	Market Rate (USD)	Indus Hospital Rate* (USD)	Number of Procedures at Indus Hospital	Cost of Procedures at Market Rate (USD)	Actual Expenditure at Indus Hospital (USD)	% Savings at Indus Hospital Rate
CABG	2642–5283	1980	113	298546–596979	223740	25%–63%
Angioplasty	951–1722	1250	34	32334–58548	42500	–31%–27%
Thyroidectomy	475–845	515	93	44175–78585	47895	–8%–39%
Total Knee Replacement	845–1585	398	69	58305–109365	27462	53%–75%
Laparoscopic Cholecystectomy	317–951	378	197	62449–187347	74466	–19%–60%
Tonsillectomy	370–845	365	87	32190–73515	31755	1%–57%
Hernia Inguinal	211–740	217	367	77437–271580	79639	–3%–71%
PEG	158–264	217	27	4266–7128	5859	–37%–18%
Angiography	264–423	185	790	208560–334170	146150	30%–56%
Colonoscopy	85 –158	145	61	5185–16104	8845	–71%–45%
Gastroscopy	85–158	108	387	32895–61146	41796	–27%–32%
Echo	37–74	24	2115	78255–156510	50760	35%–68%
Circumcision	8–26	9	314	2512–8164	2826	–13%–65%
ECG	2–5	2	12673	25346–63365	25346	0%–60%

*Indus Hospital rates are generated for internal billing purposes only. Patients are never charged and treated free-of-cost. Source: The Indus Hospital.

Exhibit 10b: **Comparison with Market Cost of Surgeries Procedures and Associated Diagnostic Tests in Karachi Pakistan (2012)**

Finances

In fiscal year 2013–2014, Indus provided about USD 10·5 million in free medical care, roughly five times the value of services provided in its first year of operations (see Exhibit 9 for more on the value of care provided over time). Ninety-eight percent of all donations were locally generated. *Zakat* comprised 34% of all donations, followed by 24% of unrestricted funds, and in-kind donations (24%), buildings (12%), grants (5%), and return on investments (1%). Overall, donations received between 2007 and 2012 totaled USD 26.6 million and had increased seven-fold, with Zakat increasing 12-fold.

Using the electronic records system, Bari could review the pages of expenses for each patient, including medications, consumables, and clinicians' time. Each item was traceable back to the person who ordered and administered it. The hospital provided detailed accounting to major donors to demonstrate that their money was used accordingly. No patient ever saw a bill. The 35% of patients who were not Muslim or made more than the income limit for *Zakat* eligibility still received free care financed by the hospital's general donation fund.

As the hospital's service volume and operating budget grew, Bari requested line-by-line expense reporting. The finance team developed a system for determining actual costs for roughly 600 procedures based on invoices and time and motion analysis that tracked staff and equipment utilization for each procedure (see Exhibits 10a and 10b for a detailed summary of costs). As the hospital's volume increased, the unit cost for nearly all procedures decreased. This detailed accounting allowed for accurate future budgeting.

Future Challenges

Ample donor funding had supported the hospital's rapid growth, including its operating budget that had increased 27-fold by 2014. Bari and the hospital's other cofounders planned to add 650 beds to the 150-bed Karachi campus and add new surgical departments. In 2014, zoning and planning for Indus Hospital's expansion were complete.

Phase one, construction of the additional 650-bed facility, was to be completed in 2018. All funds for phase one had been secured. Phase two plans included expanding total inpatient beds to 1,500 and day care beds for short surgical procedures, chemotherapy, and endoscopic procedures to 250 by 2024. By 2024, they dreamed of an Indus Health Service Network with a primary, secondary, and tertiary care footprint in all provinces through government partnerships.

As Bari said:

> When we started Indus Hospital, within one year we were approached by the government to explore possibilities of partnership. We did not have the capacity then and the government was not ready to meet the conditions we laid down (which were to give us complete operational control) ... Five years in, we have the brand and the credibility. They are asking us to manage public sector hospitals on our terms.

The Indus leaders were unsure if their success could be translated into a national program and integrated into the government system. What aspects of their model were scalable in partnership with the government?

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Footnotes

A Polio remained endemic in four countries: Afghanistan, India, Pakistan, and Nigeria.

B Family members made generous donations to the hospital following these services in lieu of paying an actual bill.

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