# Pakistan's health sector: does corruption lurk?

Pakistan's Health Policy Forum
A health-sector think tank

Heartfile

Department of Health

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This paper constitutes the preamble for the first chapter of a monograph publication for the *Partnership for Transparency Fund, NWFP Health Reform Unit* and *Heartfile* collaborative study *'Assessing governance for eliminating corruption in the health sector in Pakistan';* the study has been conceptualized and is being led by Heartfile. The preamble sets out the context and configuration of corruption in the health sector in Pakistan and sets the context of a detailed qualitative observational analysis, which will be done in the setting of one health facility in the North West Frontier Province. It is envisaged that the assessment will lead to the development of an agreed Action Plan for the NWFP Government's Department of Health on an anticorruption strategy within their jurisdiction of authority.

This initiative is being undertaken by Heartfile in the context of its mission, which is *to catalyze change within the health sector in order to improve health outcomes and strengthen Pakistan's health systems by performing analytical and technically supportive functions and playing an advocacy role.*

The preamble is in a draft shape and will serve as a background paper for Dr. Sania Nishtar's presentation on *'corruption in the health sector'* during the *'Essentials of Anti-corruption workshop'* which is being hosted by the *U4 Anticorruption Resource Center* in Islamabad Pakistan on March 14-16, 2007. As the publication is embargoed until its final release, *please do not cite, circulate or reproduce.*

# Pakistan's health sector: does corruption lurk?

Poor governance, m ismanagement, inefficiencies and corruption are often used synonymously in a health systems context. The connotation of corruption makes it distinctive though as the other three *may* be inadvertent and without the intent to benefit whereas the nuance corruption has is one of deliberate and illegal gains. Notwithstanding the vague separating lines between these expressions, it is best to address them together in a health system's context as they have complex interdependencies.

## 1. What falls within the ambit of corruption in a health systems context?

Various definitions have been proposed to label corruption. However these suffer from limitations owing to their lack of ability to encompass every facet of what might be classified within the purview of corruption. The two most commonly used definitions in the international literature are: *use of public office for private gain*;[1] and *the sale by government officials of government property for private gain*.[2] However both of these exclude the private sector from the definition and would, by characterization, exclude for example, the corrupt practices in the domain of pharmaceuticals, to which the private sector is also a party. A broader definition of corruption characterizes it *as a pattern which is seen to exist when a power holder, responsible functionary or office holder is by monetary or other rewards not legally provided for induced to take actions which favor whoever provides the rewards and thereby does damage to the public and its interests*.[3] Although this definition is broader than the previous one, an important caveat here is that this fails to appropriately allude to the ethical, moral and intellectual aspects of corruption, which

1 Bardhan P. Corruption and development: A review of issues. Journal of Economic Literature, 1997;35(3):1310-46.
2 Shleifer A, Vishny RW. Corruption. Quarterly Journal of Economics, 1993;108(3):599-617
3 Klaveren JV. The Concept of Corruption. In Heidenheimer AJ, Johnston M and LeVine VT: Political Corruption: A Handbook. New Brunswick, 1989.

have been described in this paper. These dimensions of corruption in the health sector are difficult to quantify and even separate from what is regarded as conventional behavior in the health and administrative systems as is described in the sections hereunder. In view of these considerations, this paper employs a broad definition of corruption in a health systems context within the following confines: *actions of stakeholders within the health system mandated with governance and regulatory roles, or those that have a stake in the delivery of services and/or providing inputs to the system, which are not legally provided for and which do or have the potential to do damage to the public or its interests*.[4]

Broadly, corruption should be classified into two categories; practices which involve measures that usually lead to monetary gains and others that involve non-monetary forms of corruption, which involve unethical behaviors that are not primarily geared to monetary benefit in the short term but in due course would lead to some form of benefit. A classification is proposed in Table 1; this classification will be used for the analysis in the Heartfile-Partnership for Transparency Fund partnership project entitled "Assessing governance for eliminating Corruption in the health sector in Pakistan"

Table 1 – Snap shot classification of the modes of corruption – monetary vs. non-monetary

| Monetary |
|---|
| 1. Financial leakages |
| 2. Siphoning of public funds for private gains |
| 3. Illegal profits |
| 4. Benefits |
| 5. Embezzlement |
| 6. Incentives |
| 7. Pilferage |
| 8. Illegal fees |
| 9. Kickbacks |
| 10. Informal payments |
| 11. Petty corruption – over out allowances |
| 12. Procurement frauds/irregularities |
| 13. Theft of supplies and equipment |
| 14. Over-invoicing and over payments |
| 15. Clever book keeping |
| 16. Overpayment for supplies |

4 Nishtar S. Corruption in the health sector in Pakistan. Heartfile and transparency International; 2007.

| | |
|---|---|
| 17. | Graft and padding of bills |
| 18. | Selling public positions and bribes |

| Non-monetary | |
|---|---|
| 1. | Failure to base decisions on evidence |
| 2. | Deliberate lack of oversight by public officials |
| 3. | Deliberate inattention to mechanisms that compel accountability |
| 4. | Preferential treatment to well connected individuals |
| 5. | Unfair hiring practices and nepotism |
| 6. | Collusion amongst bidders in the contracting process |
| 7. | Inattention to staff accountably for misconduct |
| 8. | Use of public leverage for the benefit of private practice |
| 9. | Illegal and unethical marketing practices |
| 10. | Managerial reluctance to confront physicians |
| 11. | Staff Absenteeism |
| 12. | Ghost workers |
| 13. | Shaving off duty hours |

The Government needs to pay attention to addressing the issue of corruption in the health sector for the singular reason that this is one of the key impediments to the impact of well-intentioned spending on health systems performance and health outcomes. If health systems are not governed well particularly in terms of lack of transparency and accountability and/or are mismanaged, they become inefficient on the one hand and allow the emergence of attitudes where there are no consequences for those who mismanage or corrupt the system. As a result workers are absent, patients to pay illegal fees and inputs are stolen and pilfered. This compromises public investments in a highly constrained environment.

# 2. Why is corruption in the health sector relevant to Pakistan?

Pakistan needs to pay special attention to corruption in the health sector in particular for a number of reasons. To contextualize the rationale, it should be recognized that Pakistan's focus on the health sector is largely propelled by commitments to meet 'program targets' as articulated in the Millennium Declaration,[5] and others embodied within indigenous policy instruments such as the Medium Term Development Framework,[6] in addition to a number of process and outputs targets in the current health policy of 2001.[7] However evidence shows that these priorities cannot be met if institutions do not function and if there is wastage of scarce resource, which leads to poor quality of care, compromised safety and efficiency and de-motivation of the staff.

There is anecdotal evidence of most forms of corruption referred to in this document at all levels of the health system within Pakistan and are seen at various levels. Anecdotal evidence is substantiated for some indicators by empirical evidence from cross-country surveys. These indicators are enumerated in (Table 2).

Table 2 – the three indicators chosen for international comparisons on corruption

| |
|---|
| Perceptions of corruption in public service |
| Frequency of informal payments to public health care providers |
| Average informal payments as a percentage of half monthly per capita income |

A cross-country survey of the public gauging perceptions of corruption in public service showed that 95% of the population perceives that the health sector is corrupt

5 The United Nations. Millennium Development Goals. Washington DC, USA: United Nations General Assembly; 2001
6 Government of Pakistan. Medium Term Development Framework 2005-10. Islamabad, Pakistan: Planning Commission; 2005
7 Government of Pakistan. Health Policy 2001. Islamabad, Pakistan: Ministry of Health; 2001.

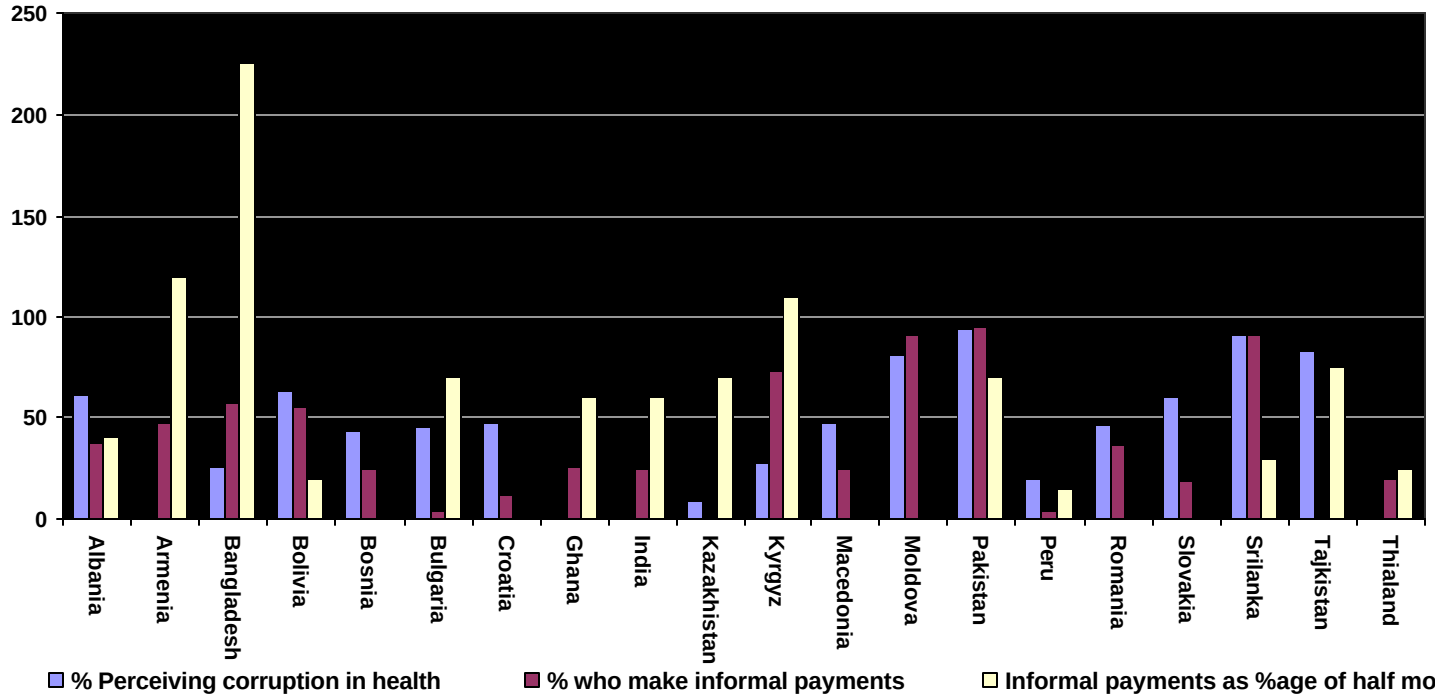
in Pakistan.[8] Another survey showed that the frequency of informal payments to public health care providers amongst the users of services is 96% in Pakistan; most of these are ex ante demands from providers. [9] Another study which assessed average informal payments as a percentage of half monthly per capita income showed that informal payments are 70% of the half monthly per-capita income in Pakistan. [10]

In addition, almost all comparative country rankings whether originating from the World Bank or Global Competitiveness Report of the World Economic Forum or other thinktanks and institutions consistently rate Pakistan quite low in public sector management, institutions and governance.[11] Pakistan also ranks low on the World banks CPIA score (country policy and institutional assessment measure which is scored between 1-5 depending upon performance part of which regards corruption and governance).[12]

These factors should compel the government to put governance at the centerpiece of health reform on the premise that health care provision depends on a system which efficiently combines financial and human resources and supplies to deliver services and that good governance is a critical factor in making such a system function.

8 Transparency International. Corruption in public services; perceived corruption in health sector . Berlin, Germany: Transparency International; 2002
9 Transparency International. Corruption in public services; informal payments among users of health services. Berlin, Germany: Transparency International; 2002
10 Transparency International. Corruption in public services; informal payments among users of health services Berlin, Germany: Transparency International; 2002
11 The World Economic Forum. Global Competitiveness Report 2006. Geneva, Switzerland: The World Economic Forum; 2006.
12 The World Bank. Country Policy and Institutional Assessment Measure. Washington DC, USA: The World Bank; 2006

Table 3: Cross country comparison of three corruption related indicator relevant to the health systems



# 3. The different modes of corruption

## 3.1. Corruption at a governance and regulatory level

The domain of stewardship, governance and regulation in the health system lend themselves to corruption in many areas; failures to base decisions on evidence underpin intellectual and moral forms of corruption. With respect to decision making, basing priorities and allocations on political expediency and benefaction rather than evidence are foremost. These may enable individuals and agencies to pursue their own agendas while compromising public interest. However in many instances these may be forced upon those in a governance role by clans, cults and outside influences. Fortunately, the selling of public positions and requiring bribes for promotion is not as ingrained in the Pakistani system as in some other regions like Eastern Europe and Central Asia.[13] Notwithstanding, these practices have been reported.

Siphoning of public funds for private gains can occur at all levels of the health system while transferring/being transmitted through various layers of national and local government's institutions on their way to the health facilities. Theoretically within Pakistan's state health system, transfer of funds from the treasury to the Ministry of Health (MoH) and from the MoH to their own provider units as well as the fiscal transfers from the Provincial to their provider units and the Provincial to the District level, etc. could be possible conduits.[14] However there seems to be little evidence for leakages at this level. Notwithstanding, within provider units, siphoning of funds, pilferage and theft is known to occur at various levels. Political and bureaucratic leakage, fraud, abuse and corrupt practices are likely to occur as a result of poorly managed expenditure systems, lack of effective auditing and supervision, organizational deficiencies and poor fiscal controls over flow of public funds.

13 Ryterman J., Hellman J., Jones G. Corruption in Russia: Interim Report. Washington DC: The World Bank, 2000.

14 Jinnah Postgraduate Medical Center Karachi, National Institute of Child Health Karachi, National Institute of Cardiovascular diseases Karachi, Pakistan Institute of Medical Sciences Islamabad, Federal Govt. Services Hospital Islamabad, Capital Hospital Islamabad, National Institute of Health Islamabad, National Institute of Handicapped Islamabad, Sheikh Zayed Hospital Lahore.

At a governance level others forms of corruption also exist such as deliberate lack of oversight by public officials, unfair hiring practices and nepotism, inattention to staff accountably for misconduct, preferential treatment to well connected individuals, conscious lack of institutionalizing mechanisms to compel accountability also constitute corruption at a health systems level.

## 3.2. Corruption in the drug supply and registration system

Corruption in drug supply and registration has a direct bearing on the performance of the health system and can reduce access to essential medicines, particularly for vulnerable groups. This practice involves both the regulators and the private sector and may involve any step along the drug supply chain, starting from registration, licensing and accreditation to the setting of prices, marketing of drugs and sale and procurements.

Corruption in the sector has its roots in the commercial interests of the non-bonafide pharmaceutical companies, who find compliance with regulations affecting drug licensing, accreditation and approvals costly and try and bribe and influence regulators to get their product registered, speed up the approval process, get favorable prices or to have their drugs included on the essential drug list in order to increase their market share.

The contracting process for the purchase of drugs offers a lucrative source of returns for corrupt officials and suppliers through kickbacks, over-invoicing, and outright graft. Evidence from developing countries shows that overpayment for supplies in public hospitals are rampant. [15] This can be assessed through ratios of highest to lowest purchase price of commonly stocked medical supplies where huge variations are often evident. Insights can be gained by observing the procurement lists and inventories in hospitals and departments of health in the provinces. In many instances approved lists for procurement show huge variation between the lowest and the highest price of different brands of the same active ingredient.

In the procurement process, common corrupt practices include collusion among bidders kickbacks from suppliers and contractors to reduce competition and to influence the selection process, and bribes to public officials monitoring the winning contractor's performance. Corrupt procurement officers can also purchase sub-standard drugs in place of quality medicines and pocket the difference in price.

In hospitals, varying quantities of drugs and medical supplies are stolen from central stores and individual facilities and are diverted for resale for personal gain in private

15 Transparency International. Global Corruption Report 2006. Berlin, Germany: Transparency International; 2006

practices or on the black market. This results due to institutionalized corruption, which involves a variety of practices such as record falsification, dispensing drugs to "ghost patients", graft and padding of bills, clever book keeping, overpayment for supplies, over-invoicing and over payments or simply pocketing the patient's payment. Other forms of abuse, fraud and mismanagement can occur due to insufficient management and monitoring capacity; e.g. supplies do not meet expected standards, or they are only partially delivered or not delivered at all, or sell low quality, expired, counterfeit and harmful drugs at cheaper prices.

The process of licensing pharmacies or chemists' shops can also be corrupted by bribes, leading to unfair decisions favoring kin or political contacts of government agents.

Aggressive drug marketing strategies often lead to the unethical promotion of medicines or to conflicts of interest that influence a physician's judgments. A range of practices are commonly used by pharmaceutical companies as incentives to encourage the use of their product such as distributing free samples, gifts, sponsored trips or training courses. Instances where physicians actually have financial incentives to prescribe certain drugs are well described anecdotally. In Pakistan, more than 350 pharmaceutical companies manufacture almost 20,000 brands of different medicines and some molecules have over 100 brands in the market. Such competition may lead to unethical marketing practices whereby a company tries to influence physicians to make them prescribe the brand/s it manufactures. A conflict of interest arises when a physician, under the influence of incentives offered by pharmaceutical firms, prescribes medicines without due consideration for appropriateness of need, socio-economic status of the patient or the quality of medicines; it is this hospitality-based incentive-intense marketing that adversely affects medical practice and treatment decisions of physicians.[16]

The ultimate outcome of all these practices are either higher prices for purchased medicine and/or compromised quality. Patients are directly affected in this process as they are forced to supply their own medications.

## 3.3. Corruption at the service delivery level

### 3.3.1 Staff absenteeism and dual job holding

Staff absenteeism and dual job holding is amongst the most serious issues at a health systems level in Pakistan; this undermines service delivery and leads to closed/under utilized public health facilities, which in turn

16 Nishtar S. The Gateway Paper: Health Systems in Pakistan – a Way Forward. Islamabad, Pakistan: Heartfile, 2006.

undermines the equity and health objectives of the publicly financed health care. In a minority of cases, absenteeism is unavoidable; for example, rural health workers often need to travel to larger towns to receive their payments, fetch supplies or drugs and are sometimes delayed by poor infrastructure or weather. However in most cases absences are frequently motivated by responsibilities at a second job. Other than absenteeism there are also other staffing issues that can undermine productivity at public health facilities. For example, lower productivity can occur through shaving off hours, late arrival and early departure, and frequent and long breaks. Absenteeism is symptomatic of an ineffective government and translates into high cost for the public sector with little output, and undermines the quality of health care across the board by relying on ill-trained providers for care and under investing in the quality of future providers.

### 3.3.2 Informal Payments

Informal payments are defined as payments to individual and institutional providers, in kind or in cash, that are made outside official payment channels or are purchases meant to be covered by health care systems. This encompasses 'envelope' payments to physicians and 'contributions' to hospitals as well as the value of medical supplies purchased by patients and drugs obtained from private pharmacies but intended to be part of government-financed health services." More specifically they are under-the-table payments to doctors, nurses and other medical staff for jumping the queue, receiving better or more care, obtaining drugs, or just simply for any care at all.[17] These have a complex relation with user fees in hospitals and although the latter is criticized for its adverse effect on equity objective, the absence of the same can encourage informal payments. In such case the most plausible option is to reconfigure service delivery so that user fees and waiver and exemption systems are both institutionalized at the same time.

### 3.3.3 Health care provider's behaviors

Under the law of the country, all publicly employed doctors are forbidden from practicing privately and many of them receive non-practicing allowances as part of their non salary allowances. That notwithstanding, most of them run lucrative private sector clinics while working in hospitals and often use the public sector leverage to boost practices in private facility settings. A number of unethical practices such as refusing to see patients in

17 Lewis M. Informal Health Payments in Central and Eastern Europe and the Former Soviet Union: Issues, Trends and Policy Implications. In Funding Health Care: Option for Europe. Figuers and Moussiales (eds). Buckingham: Open University Press, 2002.

hospitals and referring them to private clinics are well established and are almost regarded as a conventional norm. Provider-driven over-consumption of health services, over-prescription, and over-use of diagnostics as well as violation of ethical guidelines in clinical practice are well established in Pakistan. In terms of the ethics of health care alone, frequent violations of the four basis principles of: the Right to autonomy, Right to privacy, Right to choose and Right to information are often seen.

### 3.3.4 Undermining the upkeep of hospital diagnostic equipment and facilities

Implicit mechanisms for commission-based incentives which lead to the use and overuse of diagnostic facilities across the street from hospitals owned by public sector employed doctors who have organized practices and make lucrative returns on investments, are well established. There are anecdotal reports of incidences where managements of public facilities deliberately impede certain tests since these are offered at private facilities across the street.

### 3.3.5 Fee policy in hospitals

User fees in health facility settings are a contentious issue; from an equity standpoint, there is a general agreement that user fees should be introduced only if they can act as an incentive to improve quality of services. Stemming from this is the next question of what would constitute a legitimate incentive for staff? Lack of transparency in a fee policy and its use primarily as an instrument to build incentives for staff without regard to efficiency, equity and quality in a public setting are frequently observed; these are often coupled with violation of guidelines and procedures on waiver and exemption system for the poor, which are often institutionalized simultaneously, thereby exacerbating access and affordability issues for the poor.

### 3.3.6 Quackery

Non-qualified health care providers who pass themselves as qualified and provide services that they are not qualified to provide, for a cost, dominate healthcare delivery in the peri-urban and rural areas; technicians, paramedics and females health workers are known to provide services they are not legally meant to and sometimes even impersonate doctors. Unfortunately there are gaps in regulating such practices and no attempts have been made to date, to mainstream their role into the delivery of care by accrediting them to provide some services, which on the one hand can be

safe for them to deliver and on the other hand, can serve as enough of an incentive for them to stay away from the delivery of other services.

## 3.4. Corruption at the public-private interface

Under the current restructuring arrangements at the primary health care level, the administration of Basic Health Units (BHUs) and Rural Health Centers (RHCs) is being handed over to the private sector, under the President's initiative.[18] Though in principle this is in line with the need to reconfigure the mode of health service delivery in the country, an important caveat here is that this opens a potential avenue for nepotism. Lack of transparency in contracting arrangements, price negotiations and failure to safeguard the interests of the poor and failure to uphold the implementation of guidelines on ethical and administrative matters can compound access and affordability issues rather than obviate them. Therefore, there is a need to establish guidelines on ethical and administrative matters and develop sample contracts and terms for price negotiations and mechanisms to safeguard public health interest. The ultimate objective of 'restructuring BHUs' should not be to 'restructure management' but to 'reconfigure the mode of primary health care delivery' with the understanding that improving management is a first step towards improving health outcomes within communities.

## 3.5. Corruption at a regulatory level

Corruption can be ingrained at a regulatory level in the healthcare domain. Several regulatory institutions form settings for such practices. Pakistan does not have an institutional mechanism for quality control, hospital accreditation or provider credentialing except for the Pakistan Medical and Dental Council, which serves the role of provider registration only. Pakistan is, however currently underway to establishing the National Drug Regulatory Authority. Experience from many developing countries suggest that if such regulatory institutions are created without awarding the right incentives to regulators and institutionalizing the right checks and balances then paradoxically they compromise the health system rather than strengthen it.

18 Government of Pakistan, 2006.

# 4. What can we do?

Corruption is not something that can be addressed in isolation in or by the health sector. A combination of measures within the inter-sectoral domain is necessary to tackle the issue. A mutually reinforcing inter-sectoral anti-corruption agenda should be driven by forceful political will. The combination of measures has to be in sync with the health systems strengthening approach currently being pursed in the health sector.

At an overarching level, this would entail strengthening anti-corruption agencies and mandated institutional mechanisms and creating an operational linkage with the health sector, strengthening the role of the media; priming politicians and bureaucrats and others in the administrative hierarchy to broad anti-corruption measures through dedicated training and skill building.

With reference to remuneration of public servants, civil and public service reforms, which strengthen the performance-accountability-reward nexus in the health sector will have to be institutionalized in a phased manner.

A system for National Health accounts will have to be developed; this must leverage technology to enhance efficiency and promote greater transparency in health systems. For example, electronic public expenditure tracking procedures and electronic equipment and supply inventories can track leakages from the system and a nation-wide database for matching staff and wage payments can maintain up-to-date personal records and therefore can assist in eliminating abuses such as paying ghost workers.

In the area of drugs and supplies, Drug procurement reforms centered on electronic bidding will have to be introduced and phased-in for enhancing transparency. Greater transparency in the process of drug registration and pricing and quality control will also have to be institutionalized in order to improve the quality of drugs.

Local regulations will have to be strengthened in line with the international code of marketing practises and should be strictly enforced as minimum requirements for the industry and the medical community to comply with. Other measures should be promoted to check the mushrooming of spurious drugs. Strict penalties should be implemented for violations of the law which make it possible for spurious drugs to gain access to the market such as fake licenses to sell, duplicate documents, absence of warranty of purchase of all products, gaps in the sale purchase record of all products, inadequate storage practices at outlets, and the absence of unqualified personnel at outlets.

At a service delivery level, corruption can be countered by mainstreaming alternative modes of service delivery and financing. In autonomous hospitals this can be done by strengthening governance and bringing efficient management that is given true administrative and fiscal controls. Service delivery reforms at the basic health care level can increase accountability and audits through management devolution/contracting out and by giving greater fiscal and administrative autonomy. In such arrangements institutional incentives such as the ability to hire and fire the staff and authority to reward performance and discipline, transfer and terminate employees who engage in abuses and the ability to audit can also help counter corruption, albeit with safeguards. In service delivery arrangements, performance-reward incentives should be built through user fees. However, an anticorruption agenda at a health systems level is complex and warrants health system reconfiguration; this goes beyond incentives and has to do with health systems' reforms in a broader sense.

With reference to the practice of quackery, coercive regulation is unlikely to be effective due to the huge gains involved and therefore decisions to curb these practices have to be pragmatic and feasible. In particular, there is the need to develop approaches to mainstream their role into the delivery of care by accrediting them to provide some services, which on the one hand can be safe for them to deliver and on the other hand, can serve as enough of an incentive for them to stay away from the delivery of other services. Recently, the new devolution arrangements provide an opportunity to mainstream the role of community oversight for greater transparency through the creation of community citizen Boards and Village Health Committees; this opportunity must be leveraged.

In a nutshell therefore, corruption in the health system is a manifestation of a broader systems phenomenon in the country. Addressing these issues requires mandates and prerogatives outside of the health sector in the first place. Within the health sector, health systems reconfiguration is the key to institutionalizing alternative modes of health service delivery where greater transparency can be promoted. As a civil society think-tank, Heartfile is playing its strategic civil society role to catalyze change in this area.

Heartfile's current stated mission is to catalyze change within the health sector in order to improve health outcomes and strengthen Pakistan's health systems by performing analytical and technically supportive functions and playing an advocacy role.

A number of process and output level indicators are evidence of early success in the area of catalyzing change, particularly with reference to strengthening the evidence base for health reforms in Pakistan. In this connection, Heartfile charted the first health reform agenda for the country articulated in the Gateway Paper;[19] this was recognized as a blue print for a new national health policy in the country.[20] The organization is now taking a lead role in many strategic areas to assist in strategic planning and policy development. For example, supporting the country's Federal Bureau of Statistics to develop a system for consolidating health data and periodically reporting health indicators in the country;[21] charting the health segment in Pakistan's Planning Commission's Vision 2030 and assuming responsibility for the health segment in the scope of work of the National Commission for Government Reform.[22] The organizations contributions in all these areas are through the voluntary pro-bono contributions of the founder. In addition, the organization also brings value to international collaborative initiatives such as those with Transparency International, the World Health Organization and many others.[23]

19 Nishtar S. The Gateway Paper: Reforming Health Systems in Pakistan – a Strategic View. Pakistan's Health Policy Forum and Heartfile; 2005. http://heartfile.org/gwhsa.htm (accessed November 7, 06)
20 Heartfile's Memorandum of Understanding with the Ministry of Health, Pakistan. http
21 Nishtar S. Heath Indicators of Pakistan: Gateway Paper 11. Islamabad; Heartfile and Health Policy Forum, Statistics Division, 2007. ://heartfile.org/policymou.htm
22 Pakistan's Health Policy Forum, Heartfile. http://heartfile.org/policy.htm (accessed Nov 7, 06)
23 http://Heartfile.org/ International Linkages page