

CONCEPT PAPER FOR THE DESIGN OF PERFORMANCE MONITORING MECHANISM FOR HOSPITALS UNDER PUNJAB EMPLOYEES SOCIAL SECURITY INSTITUTION (PESSI)

Background

The Punjab Employees Social Security Institution (PESSI) is an autonomous body under the administrative control of Labor & Human Resource Department under the Punjab Government Rules of Business, 1974 established through the Provincial Employees Social Security Ordinance, 1965 - operational since March, 1967 and is governed by a 13 member Governing Body. It is the only autonomous body in Punjab providing **both** comprehensive healthcare coverage and cash benefits to its registered secured workers and their families. The main source of income of the institution is the collection of social security contribution from registered establishments under ordinance ibid.

Provision of health facilities to the workers and their dependants is covered under the Provincial Social Security Laws. The Provincial Employees Social Security Ordinance, 1965 requires the employers to contribute 6% of the wages of their employees (having wages up to Rs.22,000/-) to the Punjab Employees Social Security Institution.

The Medical Facilities under PESSI include comprehensive medical treatment in the Social Security Hospitals and the facilities not available in Social Security Hospitals are arranged through other hospitals at the cost of PESSI wherever those be available. In case, the required facilities are not available within the country, the same are managed abroad to cater to the health requirements of the secured persons / beneficiaries.

Currently, PESSI has several medical care facilities across Punjab. These hospitals are equipped with 24 hours emergency services - with enhanced medical facilities at certain locations. Each hospital is in turn also associated with, Social Security Emergency Centers (SSEC), Social Security Medical Centers (SSMC), and Social Security Dispensaries (SSD).

Health Care Facility	Number
Main Hospitals	17+2
Mini Hospitals	3
Social Security Dispensaries	138
Social Security Emergency Centre	87
Social Security Medical Centre	37

The total capacity of PESSI hospitals is around 2,030 beds, served by 6,835 staff members comprising of medical specialists, nurses, experts, admin staff etc. PESSI serves above 2.5 million patients every year with new facilities are being added up in the hospitals for serving additional needs of the patients.

Introduction



Given its scope of operations, PESSI is committed to providing better health services; its performance in turn however depends on the performance of its managers, health delivery infrastructure and soundness of operations. With a patient inflow of 2.5 million per year and an ever expanding secured workers base, it is critical that the institutions under PESSI remain operational, functional and effective – thereby creating a need for mechanism that could effectively set benchmarks of excellence, monitor service delivery and identify possible areas for improvement.

Adopting and installing such a system requires a thorough collection of information (data) and analysis of outcomes. Deployment of a comprehensive & integrated M&E system across all PESSI medical facilities therefore becomes the next required step.

To keep the system simple in its initial stage, the M&E system will focus mainly on the 17 hospitals under PESSI and expand in phase 2 to include SSECs, SSMCs, and SSDs. These nineteen hospitals have varying bed capacities – all of which have been classified into three categories based on this very bed capacity. Category 'A' includes hospitals having 250 or above bed capacities. Category 'B' hospitals have bed capacities ranging between 50 and 250 beds. While hospitals having 50 or less than 50 beds capacity are included into category 'C' as illustrated in following table:

Categories	Name of Hospital	Bed Capacity
<	Nawaz Sharif Social Security Hospital Lahore	550
ORY	Faisalabad Social Security Hospital	300
CATEGORY A	Islamabad Social Security Hospital	180
	Social Security Hospital Shahdara	100
	Faisalabad Maternal Newborn and Child Health Centre	100
	Khawaja Fareed Social Security Hospital Multan	100
m	Gujranwala Social Security Hospital	100
CATEGORY B	Gujrat Social Security Hospital	100
TEG	Sialkot Social Security Hospital	
5	Rehmat-Ul-Lil-Alameen Institute of Cardiology Lahore	
09:	Kot Lakhpat Social Security Hospital	50
CATEGO RY C	Okara Social Security Hospital	50



Jauharabad Social Security Hospital	25
Sheikhupura Social Security Hospital	30
Jaranwala Social Security Hospital	25
Jhang Social Security Hospital	25
Sahiwal Social Security Hospital	10

With categories predefined, the Reforms team at PESSI has conceptualized a comprehensive M&E system for data collection, reporting and validation for A, B and C hospitals. The process has been completed after a series of consultative meetings in year 2018 and 2019 with key stakeholders. Best study models of hospital performance evaluation mechanisms have been studied and considered - including models that are currently under implementation in Punjab and KPK. For data collection of KPIs, a number of existing online and offline data sources are being used that include hospital sourced information PMIS, HMIS, Biometrics and biomedical equipment tagging system.

A mechanism for data validation shall also be adopted to ensure reporting accuracy. The M&E system would be hosted on a web-based Platform that could process data from various sources and calculate key performance indicators with balance scorecard methodologies.

2. Objectives

The aim of the assignment is to explain the methodology behind design and development of a web-based performance M&E system – facilitated via online dashboards. The primary motive is to establish an interface that enables an unbiased monitoring and performance evaluation. It is aimed that this system will improve health service delivery while also building local capacity of PESSI staff. The emphasis is on result-based performance and monitoring instead of process or activities based performance.

This document therefore presents outline of the structural design of web-based M&E system based on discussion with various stakeholders.

3. System Design

This section presents structural design of the performance monitoring system, processes, data flows for measuring/capturing and presentations of calculated KPIs scorecard on the dashboards. The detailed design specifications, particularly related to software system is prepared during the system development and together with the document, shall form the overall set of technical documentations to be used as reference material in future for system maintenance and its up-gradation.

3.2. Performance domains



For Phase 1, performance domains and sub-domains for the monitoring of Category A, B and C have been identified. These domains and sub-domains relate to the major functions of the hospitals, and are given as under:

#	Domain	KPI (Monthly Reporting)
1	Planning & Management	Filled Posts
2	Planning & Management	Staff Presence
3	Planning & Management	Budget Utilization
4	Planning & Management	Cost per patient
5	Planning & Management	Drug Availability
6	Planning & Management	Equipment Availability
7	Planning & Management	Ambulance Utilization
8	Monitoring & Supervision	Administrative Review Meetings
9	Monitoring & Supervision	Clinical Audits
10	Monitoring & Supervision	Referrals from Dispensaries
11	Monitoring & Supervision	Referrals from hospitals
12	Monitoring & Supervision	Referrals to other hospitals
13	Service Delivery	Health Facility Utilization Rate (Total patients seen in OPD : self, dependents, total), (Total patients in IPD : self, dependents, total), (Total patients in Emergency : self, dependents, total), (Diet Charges)
14	Service Delivery	Bed Occupancy Rate
15	Service Delivery	Average Length of Stay
16	Service Delivery	OT Services performed
17	Service Delivery	Availability of specialized services
18	Service Delivery	Total Institutional Deliveries
19	Service Delivery	Availability: Xray, Ultrasound, ECG, CT Scan, Bloodwork
20	Service Delivery	Mortality Rate

3.3. Performance measures (KPIs)



A detailed list of quantitative performance measures, or key performance indicators (KPIs), their definition and formula for computing scores are given in Annexes. A summary is given as under:

Management Level	KPIs
Hospitals (Category A, B and C)	13 (Phase 1)
SSEC	Phase 2
SSMC	Phase 2
SSD	Phase 2

As delineated, for Phase 1 monitoring of Hospitals (Category A, B and C) a total of 13 unique indicators have been selected of which most indicators are quantifiable measures such as coverage percentages and proportions.

3.4. Data sources

A range of sources have been identified for data on key performance indicators. These include routine management information system, PMIS, Biomedical tagging, Biometrics record, HMIS, and submitted data from hospital personnel.

3.5. Configuring Scorecards

An administrative module, accessible through secure login is used for configuring the scorecard, for adding or changing key performance indicators, for assigning or changing weights of scorecard and for defining or altering formula of computation.

The scoring/weightage engine is dynamic in the sense that every time formula or weight for a particular KPI is changed, it will re-calculate performance indices of all management units and time periods according to new configuration.

3.5.1. Benchmarks and Performance Standards

For measuring performance according to set of standards, the following benchmarks have been developed after careful consultation with the concerned officials of PESSI:

- a) For a qualitative indicator having dichotomous values such as yes/no, the scores will be assigned based on full (100% in case of positive or 'yes') or NIL (0% in case of negative or 'no').
- b) For quantitative indicators having scale variables (percentage or absolute number values), the ceiling/floor cut points is used as the baseline or benchmark. Individual performance is measured in terms of variance between the KPI value and the benchmark and scores is assigned based on their relative weightage.

The system administration module of the software allows changes of benchmarks for individual KPIs and their relative scores. The system is flexible to accommodate any change in KPIs.

3.5.3. Weightage / Formula / Scoring Engine



Weights to the performance scores are based on subjective assessment of how important a performance domain and its measures. The weights are expected to change from time to time as priorities concerning health system management are changed. The scoring engine of the software is catered for this flexibility requirement through proper authentication procedure. The rights to change weights is assigned to an authorized user at the provincial level.

The **formula** for computing performance scores based on KPI value and its relevant weightage is employed on the following methods.

Ceiling and Floor method

Ceiling and Floor are two performance extreme cut point assigned as benchmark. Ceiling is desired level and Floor is undesirable level for KPI performance value.

Scorecard is calculated based on KPIs, performance standards/benchmarks and weightage system and converts utilization and service statistics into scores. The balanced scorecard gives aggregate performance in all performance domains. The scorecard is completely customizable and can be adapted to any performance management framework.

The **Scoring engine** of the software is accessible to an authorized user at the provincial level only, who will be able to configure it by assigning weights, changing scoring methods and formulas.

3.6. Processes and tools

This section describes processes and tools involved in the performance monitoring system for PESSI.

3.6.1. Data collection process

At each hospital, a focal person is designated for submitting M&E data from the sources indicated KPI sheet. The data is collected on prescribed forms and then input in the online web-based system either through a web-browser using a PC/Notebook connected to internet, or in cases where internet connectivity is not readily available, or facing electricity load-shedding issues, then an Android tablet shall be used to input data through GPRS communication system. In case, data is missing, PESSI focal person will follow up to collect missing information from hospital focal person.

Once data will be captured on the form, it will be checked for completeness, consistency and accuracy before entering into the system. A signed hardcopy shall be filed for record and future reference.

3.6.3. Web-based data management and reporting system Important Design Considerations:

Flexibility: The software system is designed keeping the "extensibility" as key design element. The software is flexible to allow changes in performance domains, measures (KPIs), their benchmarks, scoring methods and relative weightage.

Integration: The structural design and technology platform is taken into consideration for future integration with other systems. This is particularly important if move towards comprehensive and integrated HIS is made in the future. The performance management system has easy interfaces with the new online data collection/reporting systems without requiring any significant changes in its programming code or underlying database.







The Objective

PESSI, under the Health Reform Agenda has introduced an innovative, state of the art Monitoring and Evaluation regime in all PESSI Hospitals. The main objective of designing this "Hospital Performance Management System" is to establish an interface that facilitates and enables an unbiased monitoring and evaluation system. It is aimed that via measuring and reporting on key performance indicators in various domains, this system will improve Health Service Delivery and institutionalize a result based evaluation system for improved accountability.











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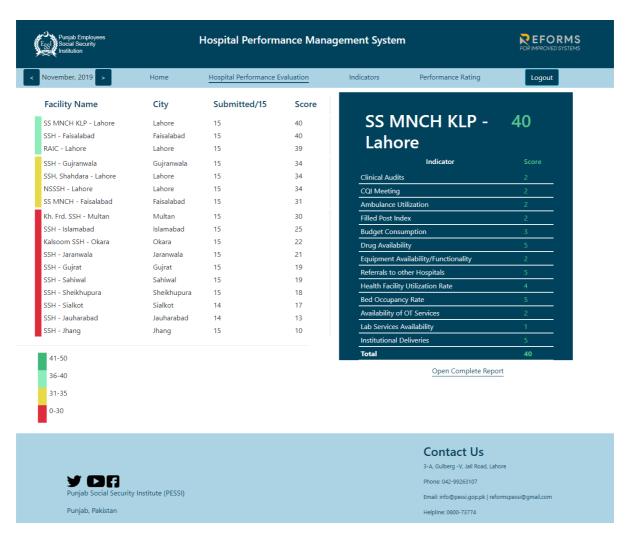
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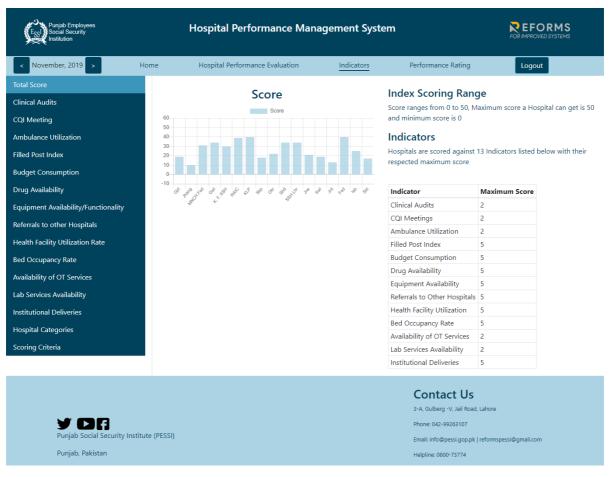
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SCORING

Domain	Subdomain	KPIs	Weight	Value Type	Performance Range	Data Source
		Filled Post Index	5	%	95-100%: 5	
	Human				89-94%: 4	
	Human Resource				83-88%: 3	HPMS Portal
	Resource	macx			77-82%: 2	
					71 - 76%: 1	
					96-100%: 5	
	Financial	Budget			91-95%: 4	
	Management	Consumption	5	%	86-90%: 3	HPMS Portal
					81-85%: 2	
Planning &					76 - 80%: 1	
Management		Drug	5	%	100%=5	PMIS
		Availability			0-99%=0	
	Medicine/Sup				98-100%: 5	Biomedical
	plies	Equipment			95-97%: 4	Tagging/Hospi tal Sourced Excel
	·	availability/f	5	%	92-94%: 3	
	und	unctionality			89-91%: 2	
					86 - 88%: 1	
	Emergency	Ambulance	2	#	50+: 2	HPMS Portal
	Transport	utilization	_		5-50: 1	
	Review	CQI	2	Y/N Y/N	Yes=2	HPMS Portal
		Meetings			No=0	
		Clinical	2		Yes=2	HPMS Portal
	Review	Audits		,	No=0	
					Category A: Inverse (10-0): 5	
					(11-20): 4	
Monitoring &					(21-30): 3	
Supervision					(31-40): 2	Hospital
		Referrals to			(41-50): 1	
		other	5	#	Category B & C:	Sourced Excel
		hospitals			Inverse (30-0): 5	
	Referrals				(31-50): 4	
					(51-70): 3	
					(71-90): 2	
					(91-120): 1	
Service Delivery	Service Quality & Delivery	Health Facility	5	#	Category A: 1501+: 5	HPMS Portal
Delivery	& Delivery	racility			1301+. 3	

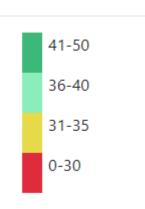


	Utilization Rate (Average Daily OPD)			1251-1500: 4 1001-1250: 3 751-1000: 2 500-750: 1 Category B & C: 1001+: 5 751-1000: 4 501-750: 3 251-500: 2 50-250: 1	
	Bed Occupancy Rate	5	%	90+: 5 80-89%: 4 70-79%: 3 60-69%: 2 50 - 59%: 1	Hospital Sourced Excel
	OT Services Availability	2	%	Major > 1 : +1 Minor > 1 : +1	HPMS Portal
	Lab Services Availability	2	%	CT Scan: +1 Ultrasound, ECG, Blood Labs, X-Ray: +1	HPMS Portal
	Total Institutional Deliveries	5	#	100+: 5 70-99: 4 50-69: 3 25-49: 2 5-24: 1	HPMS Portal
TOTAL		50			

SCORE CALCULATIONS

Following the model by CM's Strategic Monitoring Unit (SMU), scoring of the Monthly indicators will be reflected via help of Traffic Lights. The idea behind the variations available within traffic lights as highlighted below:

With the overall score, as well traffic lights will be assigned to judge the standing of each hospital i.e.





DEFINITIONS

1. Domain: Planning & Management		Weight: 22
1.1 Sub-domain: Human Resource		Weight: 5
	Definition	Essential posts filled against sanctioned posts
	Data Capture	
	Point	HPMS Portal
	Data Entry	
	Method	Automatic
	Interval	Monthly
Filled Posts Index	Formula	(Total Filled Posts / Total Sanctioned Posts) x 100
	Data Type	Percentage Value
		95-100%: 5
	Performance	89-94%: 4
	Range & Scoring	83-88%: 3
	Criteria	77-82%: 2
		71 - 76%: 1

1.Domain: Planning & Management		Weight: 22
1.2 Subdomain: Financial		
Management		Weight: 5
	Definition	% budget consumption as actual expenditure versus budget released
	Data Capture Point	HPMS Portal
	Interval	Monthly
	Data Type	Percentage Value
Budget		Numerator: Actual Expenditure
Consumption	Criteria / Formula	Denominator : Budgeted Expenditure
	Data Entry	
	Method	Automatic
		96-100%: 5
		91-95%: 4
	Performance	86-90%: 3
	Range & Scoring	81-85%: 2
	Criteria	76 - 80%: 1



1,Domain: Planning & Management		Weight:22
1.3 Subdomain: Medicines/Supplies		Weight: 5
	Definition	Essential medicines availability and balance
	Data Capture	
	Point	PMIS
	Interval	Monthly
	Data Type	Percentage value
		Numerator: No of Drugs Available
Drug Availability		Denominator: No of Essential Drugs mentioned
		in the list
	Data Entry	
	Method	Automatic/Manual
	Performance	100% = 5
	Range & Scoring	
	Criteria	0-99% = 0

1.Domain: Planning & Management		Weight: 22
1.4Subdomain: Equipment Availability		
/ Functionality		Weight: 5
		Availability and Functionality of essential
	Definition	diagnostic equipment at the hospital
	Data Capture	
	Point	Biomedical Tagging/Hospital sourced excel
	Interval	Monthly
	Data Type	Percentage value
		Numerator: No of functional equipment
Equipment		Denominator : Total No of Essential equipment
Availability /		mentioned in the list
Functionality	Data Entry	
	Method	Automatic/Manual
		98-100%: 5
		95-97%: 4
	Performance	92-94%: 3
	Range & Scoring	89-91%: 2
	Formula	86 - 88%: 1

1.Domain: Planning & Management	Weight: 22



1.5 Subdomain: Emergency			
Transport	Weight	2	
		Utilization of Ambulance in Hospital for	
		emergency transfer of Patients (Per Ambulance	
	Definition	Patients transfer)	
	Interval	Monthly	
	Data Type	Per Ambulance Patient Transfer	
A mahaalamaa		Numerator: No of Patients transfer through	
Ambulance		Ambulance	
Utilization	Criteria /	Denominator : No of Functional Ambulance in	
	Formula	Hospitals	
	Data Entry		
	Method	Automatic	
	Performance	50+: 2	
	Range	5-50: 1	

2. Domain/Subdomain:		
Monitoring &		
Supervision	Weight	9
2.1 Subdomain:		
Review	Weight	4
	Definition	CQI meetings
	Data Capture	
	Point	HPMS Portal
	Interval	Monthly
CQI Meetings	Data Type	Boolean
	Data Entry	
	Method	Automatic
	Performance	Yes=2
	Range & Scoring	
	Formula	No=0
	Weight	2



2. Domain: Monitoring & Supervision	Weight	9
2.2 Subdomain: Review	Weight	4
	Definition	Clinical Audits Held in the hospital
	Data Capture	
	Point	HPMS Portal
	Interval	Monthly
	Data Type	Yes/No
KPI: Clinical Audits	Data Entry	
	Method	Automatic
	Performance	Yes=2
	Range &	
	Scoring	
	Criteria	No=0
	Weight	2

2. Domain: Monitoring &		
Supervision	Weight	9
2.3 Subdomain:		
Monitoring & Supervision	Weight	5
	Definition	Total Referral from the hospital
	Data Capture	
	Point	HPMS Portal
	Interval	Monthly
	Data Type	Percentage Value
		Numerator: Total Number referred to other
		Hospital
	Criteria /	Denominator: total number of emergency
	Formula	patients
Defermale	Data Entry	
Referrals	Method	Automatic
		Category A: Inverse
		(10-0): 5
		(11-20): 4
		(21-30): 3
		(31-40): 2
		(41-50): 1
		Category B & C: Inverse
		(30-0): 5
	Performance	(31-50): 4
	Range	(51-70): 3



(71-90): 2
(91-120): 1

3. Domain: Service Delivery		
and Quality	Weight	19
3.1 Subdomain: Service		
Delivery	Weight	19
		Average no outdoor patient visited hospital
	Definition	per day
	Data Capture	
	Point	HPMS Portal
	Data Type	Number
		Numerator: Total OPD attendance (New +
		Follow up)
	Criteria /	Denominator: Number of working days x
	Formula	Bed Strength
	Data Entry	
Health Facility Utilization Rate (Average Daily OPD)	Method	Automatic
		Category A:
		1501+: 5
		1251-1500: 4
		1001-1250: 3
		751-1000: 2
		500-750: 1
		Category B & C:
		1001+: 5
	Performance	751-1000: 4
		501-750: 3
	Range	251-500: 2
	Benchmarks	50-250: 1
	Weight	5

3. Domain: Service		
Delivery	Weight	19
3.1 Subdomain: Service		
Delivery	Weight	19
	Definition	Per day average filled Beds in hospital
Red Occurrency Rete	Data Capture	
Bed Occupancy Rate	Point	HPMS Portal
	Data Type	Percentage Value



Criteria /	Numerator: Average Beds filled daily
Formula	Denominator: Total Number of Beds
Data Entry	
Method	Automatic
	90+: 5
	80-89%: 4
	70-79%: 3
Performance	60-69%: 2
Range	50 - 59%: 1
Weight	5

3. Domain: Service	!	
Delivery	Weight	19
3.2 Subdomain: Service		
Delivery	Weight	19
		Hospital provided Surgical Procedure
	5 6	performed under General Anesthesia and
	Definition	Spinal Anesthesia
KPI: OT Service	Data Entry	
	Method	Automatic
Availability	Performance	Major > 1:+1
	Range	Minor > 1:+1
	Weight	2

3. Domain: Service Delivery	Weight	19
3.2. Subdomain: Service		
Delivery	Weight	19
		Essential Lab services provided in the
		hospital (CT Scan, ECG, Ultrasound,
	Definition	Bloodwork, MRI)
KDI. Lab Caminas Availability	Data Entry	
KPI: Lab Services Availability	Method	Automatic
	Performance	CT Scan: +1
	Range	Ultrasound, ECG, Blood Labs, X-Ray: +1
	Weight	2



3. Domain: Service		
Delivery	Weight	19
3.2 Subdomain: Service		
Delivery	Weight	19
		Number of Deliveries Conducted in the
	Definition	hospital
	Data Capture Point	HPMS Portal
	Data Type	Number
		Number of Deliveries Conducted in a
KDI. Total Institutional	Criteria / Formula	month
KPI: Total Institutional	Data Entry Method	Automatic
Deliveries		100+: 5
		70-99: 4
		50-69: 3
	Performance	25-49: 2
	Range	5-24: 1
	Weight	5