

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
CATEGORY A	Nawaz Sharif Social Security Hospital Lahore	550
	Faisalabad Social Security Hospital	300
	Islamabad Social Security Hospital	180
CATEGORY B	Social Security Hospital Shahdara	100
	Faisalabad Maternal Newborn and Child Health Centre	100
	Khawaja Fareed Social Security Hospital Multan	100
	Gujranwala Social Security Hospital	100
	Gujrat Social Security Hospital	100
	Sialkot Social Security Hospital	100
	Rehmat-UI-Lil-Alameen Institute of Cardiology Lahore	65
CATEGORY C	Kot Lakhpat Social Security Hospital	50
	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.

OT Services Performed



Major: 5
Minor: 30

Institutional Deliveries



C-Section: 3
NVDs: 3

Health Facility Utilization



OPD: 0
Indoor: 0
Emergency: 0

*Monthly Data is Being Displayed here



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Facility Name	City	Submitted/15	Score	
SS MNCH KLP - Lahore	Lahore	15	40	
SSH - Faisalabad	Faisalabad	15	40	
RAIC - Lahore	Lahore	15	39	
SSH - Gujranwala	Gujranwala	15	34	
SSH, Shahdara - Lahore	Lahore	15	34	
NSSSH - Lahore	Lahore	15	34	
SS MNCH - Faisalabad	Faisalabad	15	31	
Kh. Frd. SSH - Multan	Multan	15	30	
SSH - Islamabad	Islamabad	15	25	
Kalsoom SSH - Okara	Okara	15	22	
SSH - Jaranwala	Jaranwala	15	21	
SSH - Gujrat	Gujrat	15	19	
SSH - Sahiwal	Sahiwal	15	19	
SSH - Sheikhpura	Sheikhpura	15	18	
SSH - Sialkot	Sialkot	14	17	
SSH - Jauharabad	Jauharabad	14	13	
SSH - Jhang	Jhang	15	10	

41-50

36-40

31-35

0-30

Patients treated in Indoor

Patients treated in Outdoor

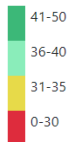
Patients treated in Emergency

Institutional Deliveries Conducted

OT Services Performed



Facility Name	City	Submitted/15	Score
SS MNCH KLP - Lahore	Lahore	15	40
SSH - Faisalabad	Faisalabad	15	40
RAIC - Lahore	Lahore	15	39
SSH - Gujranwala	Gujranwala	15	34
SSH, Shahdara - Lahore	Lahore	15	34
NSSSH - Lahore	Lahore	15	34
SS MNCH - Faisalabad	Faisalabad	15	31
Kh. Frd. SSH - Multan	Multan	15	30
SSH - Islamabad	Islamabad	15	25
Kalsoom SSH - Okara	Okara	15	22
SSH - Jaranwala	Jaranwala	15	21
SSH - Gujrat	Gujrat	15	19
SSH - Sahiwal	Sahiwal	15	19
SSH - Sheikhpura	Sheikhpura	15	18
SSH - Sialkot	Sialkot	14	17
SSH - Jauharabad	Jauharabad	14	13
SSH - Jhang	Jhang	15	10



SS MNCH KLP - 40 Lahore

Indicator	Score
Clinical Audits	2
CQI Meeting	2
Ambulance Utilization	2
Filled Post Index	2
Budget Consumption	3
Drug Availability	5
Equipment Availability/Functionality	2
Referrals to other Hospitals	5
Health Facility Utilization Rate	4
Bed Occupancy Rate	5
Availability of OT Services	2
Lab Services Availability	1
Institutional Deliveries	5
Total	40

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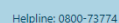
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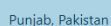
Logout

Scoring Criteria

Indicator	Maximum Score
Clinical Audits	2
CQI Meetings	2
Ambulance Utilization	2
Filled Post Index	5
Budget Consumption	5
Drug Availability	5
Equipment Availability	5
Referrals to Other Hospitals	5
Health Facility Utilization	5
Bed Occupancy Rate	5
Availability of OT Services	2
Lab Services Availability	2
Institutional Deliveries	5



Helpline: 0800-73774



SCORING

Domain	Subdomain	KPIs	Weight	Value Type	Performance Range	Data Source
Planning & Management	Human Resource	Filled Post Index	5	%	95-100%: 5	HPMS Portal
					89-94%: 4	
					83-88%: 3	
					77-82%: 2	
					71 - 76%: 1	
	Financial Management	Budget Consumption	5	%	96-100%: 5	HPMS Portal
					91-95%: 4	
					86-90%: 3	
					81-85%: 2	
					76 - 80%: 1	
	Medicine/Supplies	Drug Availability	5	%	99-100%=5	PMIS
					97-98%=4	
					95-96%=3	
					93-94%=2	
					91-92%=1	
					0-90%=0	
		Equipment availability/f functionality	5	%	98-100%: 5	Biomedical Tagging/Hospital Sourced Excel
					95-97%: 4	
					92-94%: 3	
					89-91%: 2	
					86 - 88%: 1	
	Emergency Transport	Ambulance utilization	2	#	50+: 2	HPMS Portal
					5-50: 1	
<u>Monitoring & Supervision</u>	Review	CQI Meetings	2	Y/N	Yes=2	HPMS Portal
					No=0	
		Clinical Audits	2	Y/N	Yes=2	HPMS Portal
					No=0	
	Referrals	Referrals to other hospitals	5	#	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 (31-50): 4 (51-70): 3	Hospital Sourced Excel

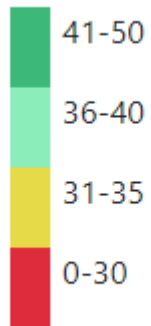
					(71-90): 2 (91-120): 1	
Service Delivery	Service Quality & Delivery	Health Facility Utilization Rate (Average Daily OPD)	5	#	Category A: 1251+: 5 1001-1250: 4 751-1000: 3 500-750: 2 1-499: 1	HPMS Portal
					Category B & C: 751+: 5 501-750: 4 251-500: 3 50-250: 2 1-49:1	
		Bed Occupancy Rate	5	%	90+: 5	Hospital Sourced Excel
					80-89%: 4	
					70-79%: 3	
					60-69%: 2	
					50 - 59%: 1	
		OT Services Availability	2	%	Major > 1 : +1	HPMS Portal
					Minor > 1 : +1	
		Lab Services Availability	2	%	CT Scan: +1	HPMS Portal
					Ultrasound, ECG, Blood Labs, X-Ray: +1	
		Total Institutional Deliveries	5	#	100+: 5	HPMS Portal
					70-99: 4	
					50-69: 3	
					25-49: 2	
					5-24: 1	
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
Filled Posts Index	Definition	Essential posts filled against sanctioned posts
	Data Capture Point	HPMS Portal
	Interval	Monthly
	Formula	$(\text{Total Filled Posts} / \text{Total Sanctioned Posts}) \times 100$
	Data Type	Percentage Value
	Performance Range & Scoring Criteria	95-100%: 5
		89-94%: 4
		83-88%: 3
		77-82%: 2
		71 - 76%: 1

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

1,Domain: Planning & Management		Weight:22
1.3 Subdomain: Medicines/Supplies		Weight: 5
Drug Availability	Definition	Essential medicines availability and balance

	Data Capture Point	PMIS
	Interval	Monthly
	Data Type	Percentage value
		Numerator: No of Drugs Available
		Denominator: No of Essential Drugs mentioned in the list
	Performance Range & Scoring Criteria	99-100%=5
		97-98%=4
		95-96%=3
		93-94%=2
		91-92%=1
		0-90%=0

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

1.Domain: Planning & Management		Weight: 22
1.5 Subdomain: Emergency Transport	Weight	2

Ambulance Utilization	Definition	Utilization of Ambulance in Hospital for emergency transfer of Patients (Per Ambulance Patients transfer)
	Interval	Monthly
	Data Type	Per Ambulance Patient Transfer
	Criteria / Formula	Numerator: No of Patients transfer through Ambulance
		Denominator: No of Functional Ambulance in Hospitals
	Performance Range	50+: 2 5-50: 1

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

2. Domain: Monitoring & Supervision	Weight	9
2.2 Subdomain: Review	Weight	4
KPI: Clinical Audits	Definition	Clinical Audits Held in the hospital
	Data Capture Point	HPMS Portal
	Interval	Monthly
	Data Type	Yes/No

	Performance Range & Scoring Criteria	Yes=2
		No=0
	Weight	2

2. Domain: Monitoring & Supervision	Weight	9
2.3 Subdomain: Monitoring & Supervision	Weight	5
Referrals	Definition	Total Referral from the hospital
	Data Capture Point	HPMS Portal
	Interval	Monthly
	Data Type	Percentage Value
	Criteria / Formula	Numerator: Total Number referred to other Hospital
		Denominator: total number of emergency patients
	Performance Range	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 (31-50): 4 (51-70): 3 (71-90): 2 (91-120): 1

3. Domain: Service Delivery and Quality	Weight	19
3.1 Subdomain: Service Delivery	Weight	19
Health Facility Utilization Rate (Average Daily OPD)	Definition	Average no outdoor patient visited hospital per day
	Data Capture Point	HPMS Portal



	Data Type	Number
	Criteria / Formula	Numerator: Total OPD attendance (New + Follow up)
		Denominator: Number of working days x Bed Strength
	Performance Range Benchmarks	Category A: 1251+: 5 1001-1250: 4 751-1000: 3 500-750: 2 0-499: 1
		Category B & C: 751+: 5 501-750: 4 251-500: 3 50-250: 2 0-49: 1
	Weight	5

3. Domain: Service Delivery	Weight	19
3.1 Subdomain: Service Delivery	Weight	19
Bed Occupancy Rate	Definition	Per day average filled Beds in hospital
	Data Capture Point	HPMS Portal
	Data Type	Percentage Value
	Criteria / Formula	Numerator: Average Beds filled daily
		Denominator: Total Number of Beds
	Performance Range	90+: 5
		80-89%: 4
		70-79%: 3
		60-69%: 2
		50 - 59%: 1
	Weight	5

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

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

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