

Review Article

Information Technology Systems in Public Health and Clinical Care: Some Punjab Information Technology Board Initiatives

Saflain Haider¹

¹Adl. Director General E-Government Applications, Punjab Information Technology Board

Abstract

E-Government Applications (EGA) is at the helm of automating health-sector and is committed to making a difference by bringing about an Information Technology-centric revolution in this sector. From providing IT-based solution and system for fatal diseases like dengue, hepatitis and polio to raising awareness of various health initiatives and helping health department in service delivery, Punjab Information Technology Board (PITB) has a long list of projects which are making combined efforts for the betterment of health-sector.

Keywords | Information technology, health reforms, public health

Introduction

Punjab Information Technology Board is an autonomous body established by Government of Punjab is the hub of IT-based interventions and spearheads multitude projects providing IT services and related infrastructure at local, governmental and international level.¹

Health Complaint Management System

Health Complaint Management System has been developed with an aim to bridge the gap between the hospital management of Teaching Hospitals, DHQs, THQs, BHUs and RHCs and the patients by addressing their inquiries and complaints via a toll-free number (0800-99000). Complaints and inquiries not only come from health facilities but, they cover cases of measles, polio, dengue, hepatitis, TB, spurious drugs, AIDS etc. as well.

Robot calls are sent out to spread awareness on dengue and polio. The following piecharts represent category wise complaints in primary, secondary and specialised care in Figures 1, 2 and 3 respectively, from 9th September, 2018 till 6th June, 2019:

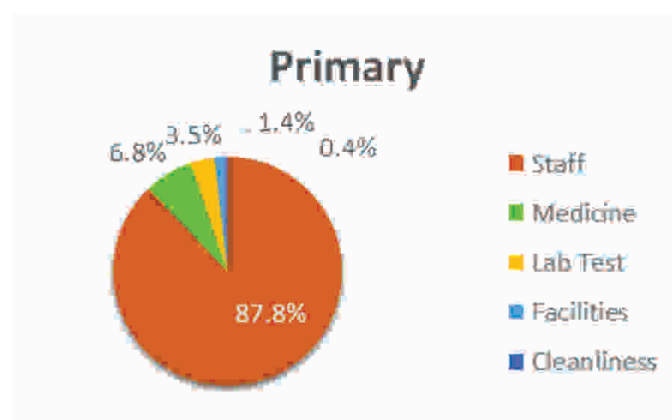


Fig 1

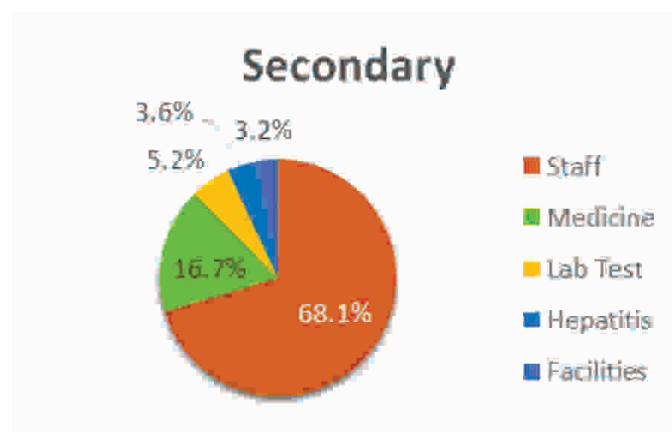


Fig. 2

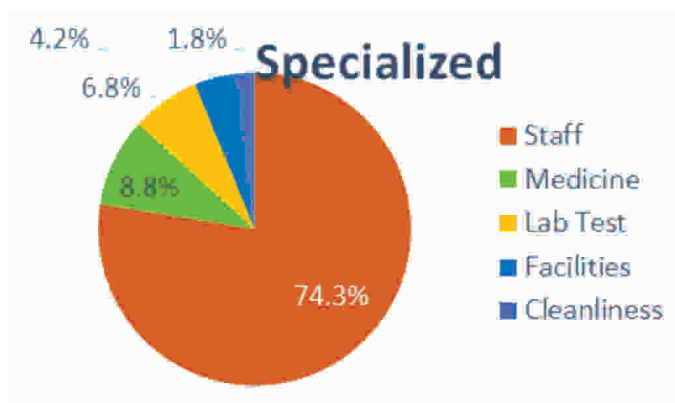


Fig 3

Health Inspection of Facilities

This system is run via an android app by MEAs (Monitoring and Evaluation Assistants) who have done 200,000 visits so far using the system and who assess the following Key performance indicators, (KPIs):

- Attendance of Medical Officers
- Cleanliness
- Availability of utilities
- Medical equipment and its details
- Medicine stock
- Patient experience
- Outlook of facilities
- Program specific information for hepatitis and TB etc.

Disease Tracking System

Disease Tracking System is a centralized system to monitor and control, communicable & epidemic-prone diseases. Data for surveillance is being captured from all across Punjab and from all levels of healthcare facilities i.e. primary (2,828 RHCs and BHUs), secondary and tertiary (210 hospitals). Dedicated data entry operators (who are equipped with a laptop and internet connectivity) have been put into place to report cases from all hospitals. A committee consisting of WHO, IPH, KEMU, Health Department and PITB reviews the data and then publishes weekly disease bulletins and disease alerts. 14.6 million patient consultations have been registered in the system and over 200 Weekly SITREP have been published since July 2013.²

Health- Hospital Information Management System

Hospital Information Management System aims at digitizing all the aspects in a hospital ranging from managing patient queues to medicine dispensation.³ This system has been successfully deployed in 27 secondary healthcare facilities. Following figures represent current scenario of the system across Punjab:

- 19 Million patients have been served using the system
- 75 Million units of medicines have been dispensed
- 6 Million lab tests have been advised

Biometric System

This system is deployed across Punjab to ensure presence of clinical and non clinical staff, so that healthcare service delivery can be improved. Real-time attendance can be monitored of any health facility where the system is deployed and allows for centralized roster management. More than 77,000 staff members are enrolled in the system at DHQs, THQs, RHCs and BHUs. There has been an increase in staff presence from 58% to 85% in secondary healthcare facilities.

E-BHU's

E-BHUs or telemedicine encompasses a concept whereby physicians are housed under one roof with a video conference setup to remotely provide healthcare services to the patient arriving at the farflung BHUs across various districts of Punjab. The project has been piloted in BHU Bhojowal, BHU Bherowal, BHU Dhunni Kalan and BHU RerkaBala. The total registrations and telemedicine sessions have been 34,779, patient referrals accumulate to 698 and medicine units prescribed are in excess of 53,385.

Health: Automation of Drug Regime

DTMS

Drugs Testing and Monitoring System (DTMS) was an initiative taken by the P&SHD, Government of Punjab to improve the authenticity of verification and performance test performed on different types of drugs. A system was required to monitor and improve

information relating to drug featuring its sample collection, test analysis and reporting it in a well-automated and secure way. To achieve aforementioned, DTMS was developed to provide complete and secure monitoring (using coding technique) of drugs. Along with ensuring the quality of testing, it also provides secure access to data to authorized personnel. More than 38,900 samples have been processed so far through the system.

CDSL

Centralized Drug licensing system was established with the intention of digitalised issuance of license to retailers as well as distributors of drugs. The applications were also digitalised in a centralized database. The system is functional across all districts of Punjab and 27, 983 applications have been processed using the system so far.⁴

DIME

It was need of the hour to introduce a system that could enable the operational leads of department to have quantifiable data of point-of-sales at drugs outlets which could assist them in their monitoring. An android-based application was developed in this regard to monitor KPIs in drug outlets across Punjab by the name of DIME (Drugs Inspection Monitoring and Evaluation). So far 60, 734 inspections have been registered using the system.

Quality Control Board (QCB)

Quality Control Board constitutes a process in which monthly reports detailing quality control of drugs are submitted to Provincial and District Board who review the performance of manufacturers/ sellers and may then refer the case to Drug Court if the seller/manufacturer is proven guilty for commission of offence under the relevant Act. Digitalization of aforementioned process is underway.

Medicine Procurement

The system was designed to replicate the manual process of medicine procurement which moved through different departments with automation in a way that maximized transparency. The complete bulk procurement (2016-2017) was carried through system in Primary & Secondary Healthcare Depart-

ment. Vendors are qualified on transparent criteria defined by procurement cell while all contracts under procurement of medicines have been generated through system. 6 billion PKR worth of medicine is procured using system in a typical year.

Medicine Inventory

Most of the healthcare facilities of Punjab were recording the stock of their medicines manually on their local physical registers and therefore, neither the hospital administration, nor the Provincial administration had a real-time visibility of the stock at hand, out of stock medicines, expired medicines and other KPIs to efficiently monitor and order their stock. The necessity of real-time visibility of the medicines at central level prompted the development of Medicine Inventory System. With this development, the inventory process of healthcare facilities was digitised. Pharmacists at the healthcare facilities upload their stock balance and maintain their medicines and surgical supplies using this system.

Following KPIs are being monitored using this system:

- Medicines in Stock
- Expired Medicines
- Transferred Medicines
- Medicines Expiring in 90 Days
- Medicines Expiring in 120 Days
- Medicines Expiring in 180 Days
- Department wise Medicine Allocation
- Hospitals with Medicines Out of Stock
- User Activity Report

Local Purchase

Local Purchase system is an online bidding platform for procurement of medicine and where multiple vendors have the access of portal to quote using the same portal. The system evaluates the total bids and notifies the lowest bidder. It provides real-time information to health department to monitor the rates of government approved medicines on a daily basis. Furthermore, it enables SHC&ME and different hospitals to generate different reports which are used for tracking of ordered medicines.

Integrated Blood Transfusion System

Integrated Blood Transfusion System is an end-to-end digitalisation of a transfusion transaction for a hospitalized patient. The system allows for centralized visibility of blood inventory by having a central repository of data from private and government blood banks. It entertains an inter-hospital blood request and allows for its movement and maintains a donor database. The system is presently running in Punjab Institute of Cardiology, Sir Ganga Ram Hospital and Mayo Hospital in Lahore. The future plans constitute of a Pakistan-wide system roll out, establishment of Regional Blood Centers of Safe Blood Transfusion Authority across Pakistan and Army's blood banks

operating under Armed Forces Institute of Transfusion.

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