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## An Exploratory Study on the Effectiveness of Citizen Centric E-Governance Project “Hospital Management Information System” in Gujarat

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### Abstract:

The main objective of Health Management Information System is to provide accurate and reliable information on time to program managers and stakeholders for appropriate decision making. This paper seeks to examine popularity and usage of various functions of HMIS among users at Public Health Clinic level. Present research involves the exploratory approach to study the effectiveness of HIMS initiatives of Government of Gujarat. HIMS has been selected as case studies of e-governance projects of Government of Gujarat for the purpose of analysis. The main results are that among all users of HMIS 56 percent have reported that they are fully satisfied while 44 percent are partially satisfied with HMIS while 50% of the respondents reported that the system was beneficial to the society using it. This is so because individual opinions vary from person to person but it appeared that the system in vogue was a successful attempt that needs to be pursued vigorously. This aspect need to be kept in view to eradicate discrepancies mentioned with a view to rise to a level of higher standards in the system.

Key words: *Public Health Clinic, stakeholders, vogue, vigorously, discrepancies*

### Introduction

In recent times, there has been increased use of the terms like "governance" and "bad governance" "poor governance" "minimum governance" "good governance" in the development of literature along with day to day communication across the world. Bad governance or poor governance is being increasingly regarded as one of the root causes of all evil within our societies. The concept of governance is not new. It is as old as the human civilization itself. According to United Nations "governance" means: the process of decision-making and the process by which decisions are implemented (or not implemented). Governance can be used in several contexts such as corporate governance, international governance, national governance and local governance"

### E-Governance

E-Governance or Electronic Governance means using Information and Communications Technology (ICT) to transform functioning of the Government. E-Governance differs from E-Government as the concept of Governance has wider meaning than Government. E-Government i.e. Electronic Government is application of Information and Communications Technology (ICT) to run or carry on the business of the Government. Governance is referred to as an activity of governing/controlling a

country by its Government, controlling of an organization or a company by its CEO or Board of Directors or controlling of a house hold by the head of the house.

### **E-Governance in Gujarat**

Gujarat has been one of the frontline State in the implementation of E-Governance policies & projects in India. Independent agencies have rated Gujarat as one of the most e-prepared State in the country. State Govt. has adopted innovative / progressive policies for promotion of E-Governance in the State. State Govt. has adopted Innovative, constructive and result oriented progressive policies for the promotion of E-Governance. Through the Nodal Agency, the Government's Science and Technology Department has positioned Gujarat, as a Key State in the Knowledge Sector and acts as a medium to make Government-Citizen Interface more effective, transparent and efficient.

**Figure 1.1 E-Governance Gujarat**



Source <https://dst.gujarat.gov.in>

### **Hospital Management Information System (HMIS)**

Accurate, relevant and up-to-date information is essential for the health service providers at all levels so that they can initiate action on the gaps in the system based on evidence and information. Recognizing the need for an information base, one of the core strategies of the “Strengthening capacities for data collection, assessment and review for evidence based planning, monitoring and supervision”. As a step in this direction, the Ministry is establishing a dedicated Health Management Information System (HMIS) portal for all Public Health related information<sup>1</sup>

### **HMIS in Gujarat**

HMIS system of Gujarat is known as Gujarat Hospital Management Information System (GHMIS) which is the responsibility of Department of Health and Family Welfare, Government of Gujarat. GHMIS project was conceptualized by the department of health and family welfare Government of Gujarat in order to ensure that the quality of health care by the application of information and communication technology (ICT) to be exercised in such a manner that to provide standard clinical

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<sup>1</sup><http://nrhm-mis.nic.in>

and diagnostic tools, hospital management tools and integration of management information at the state level, so as to ensure online reviewing and monitoring of GHMIS has been visualized, not only to help the administrator to have better monitoring and control of functioning of hospitals across the state using decision support indicators, but also to assist the doctors and medical staff, to improve health services with readily available reference of patients data flow, enabled less paper processes and parameterized alarms and triggers during patient treatment cycle. GHMIS helps in monitoring pre-defined health indicators which helps to have informed decision making at the state level for policy and strategic decisions.

### **Use of HMIS Functions**

HMIS is very comprehensive system covering wide variety of operations. The main operations available within HMIS to be used at the base level at PHC are listed below;

#### **(a) Patient Care Services**

- Registration
- Ward
- Pharmacy
- Billing
- Patient Education
- Information Kiosk
- Nursing Care

#### **(b) Clinical Services**

- Clinical/EMR
- Laboratory
- Blood Bank

#### **(c) Hospital Admin**

- Hospital Admin
- Human Resource
- Payroll
- Financial Accounting
- Store/Inventory
- Purchase
- Complaints and Redressal
- Transportation
- MIS
- EIS Report

#### **(d) Ancillary Services**

- National Program
- Linen Management
- Equipment Maintenance
- Resource Scheduling
- Special Camps and Training
- Bio Medical Waste

- Application security
- NABH (National Accreditation Board for Hospitals and Health Care)
- RKS (RogiKalyanSamiti)

The lists of operations handled by HMIS as presented above is not an exhaustive list but are most commonly used functions available. The list is arrived at after discussion with the authorities and policy makers.

### **Literature Review**

**Linda, L.;&Koss, R.H.I.A., (2016)** studies the HMIS of United States and reported that The American healthcare industry is in the midst of protracted and profound transition in how care is delivered and how it is paid for. The long-term impacts of the changes already underway and those yet to come are certainly not clear. The exact course of change is being widely debated by many, from politicians to healthcare leaders to the man on the street. While the form of change may be debatable, there is little disagreement that the urgent need to improve the broken, antiquated and financially crippled healthcare system of our nation. Technology has been developed and is being refined every day to meet the need for advanced information management.**Obianuju, E. N.;& Oliver, T. U. (2015)** contributed their research work under the titled “Barriers to Optimal Utilization of Health Information Resources by Doctors in Nigeria” with the main aim to investigate the difficulties doctors encounter in accessing health information and strategies for countering the problems for optimal utilization of information resources. Data were collected for the purpose of study with the use of structured questionnaire administered to all the 1,995 Doctors in the six teaching hospitals in South East Nigeria. Findings of the study indicated that high cost of acquiring materials and non-conducive library environment are considered the biggest problems. **Maheswarappa, B.S. and Bhadrashetty, A, (2015)** in their article titled “Use of Health Information by Citizens in Gulbarga City, Karnataka State, India” explores the use made of television, radio, print materials, human, and institutional sources by citizens of Gulbarga City for obtaining health information. According to them little use and low rating of these sources in getting health information compel the need for targeting more and more information on health – physical, mental, social and spiritual - through different channels. Research suggests the need for public health awareness combined with educational programs to create awareness and educate the citizens in the use of information sources for making best use of health information. Study conclude that citizens need orientation and education in the use of television, radio and print materials, human and institutional sources including Internet in using health information as "the wealth of a nation depends on the health of the people.**Daniel, V. M., Pereira, V. G.&Macadar, M. A. (2014)** in research work titled “An Institutional Perspective of Health Information Systems in two Brazilian States” reported that Health Information Systems (SIS) are technological artifacts allowing public managers in three government spheres to obtain essential information for the management and planning of the Brazilian Unified Health System. Research used ‘Institutional Theory’ as the theoretical framework to analyze the incorporation of SIS in Brazilian public health. Objective of the study is to investigate the influence institutional factors have on SIS use by State

Health Departments (SES). Research used a qualitative approach; with multiple SES case studies in the states of Paraná and Rio Grande do Sul. The Mortality Information System (SIM) and the Decentralized Hospital Information System (SIHD) were considered the units of analysis by researcher. Based on the proposed conceptual model, institutional factors that influence the use of these SIS, in the form of coercive, mimetic and normative pressures, are presented and analyzed.

### **Objectives of Study**

1. To ascertain the popularity and usage of various functions of HMIS among users at PHC level
2. To access the satisfaction of beneficiaries of the e-Governance projects with specific reference to HMIS

### **Research Methodology and Sampling Design**

In order to study the perception of users about Health Management Information System (HMIS) survey was conducted among users of the system. Sample of 100 respondents using HMIS was selected mainly from primary health centers (PHCs). Primary data were collected using structured questionnaire. Before actual enumeration process, pilot testing of the questionnaire was undertaken in order to check the reliability of the instrument. The questionnaire covered information about basic profile of users, awareness, training on system, satisfaction with the use of system, suggestions to improve the system in order to make it more effective. In order to measure the usage and level of satisfaction with HMIS, five point scales were developed covering various services offered under HMIS like patient care services, clinical services, hospital administration services, ancillary services etc. The reliability of scales was tested using Cronbach's Alpha. The details of results of the survey among users of HMIS are presented in current chapter.

The research unit for HIMS is primary health center (PHCs). In the first stage 10 districts have been selected based on implementation of HIMS. In the second stage 10 villages have been selected and PHCs from selected villages have been enumerated. Thus total 100 PHCs have been included in the study.

Districts: 10

Villages: 10 villages per districts ( $10 \times 10 = 100$  villages)

Respondents: 1 per villages ( $100 \times 1 = 100$ )

Data for the purpose of research have been collected by visiting the state level office and field level offices. The purpose of exploratory study was to get a reasonable understanding of the system and to identify stakeholders with their roles in the system. Primary data have been collected using questionnaire method. Study proposes separate questionnaires for each of the stakeholders. Prolonged interviews will also be conducted of Head of organizations and project leaders. Study proposes pilot testing of the questionnaire before finalization of the same. It is proposed to conduct pilot survey of 60 respondent from the beneficiary of I-PDs and 25 respondents from the users of HIMS. Suitable modification in the questionnaire has been done based on the results of pilot testing. The secondary information and data have been collected from various sources covering available project documents, websites, published literature, project manuals, project presentations etc. Study also proposes use of Focus Group Discussion (FGDs) for the collection of qualitative information about corruption and

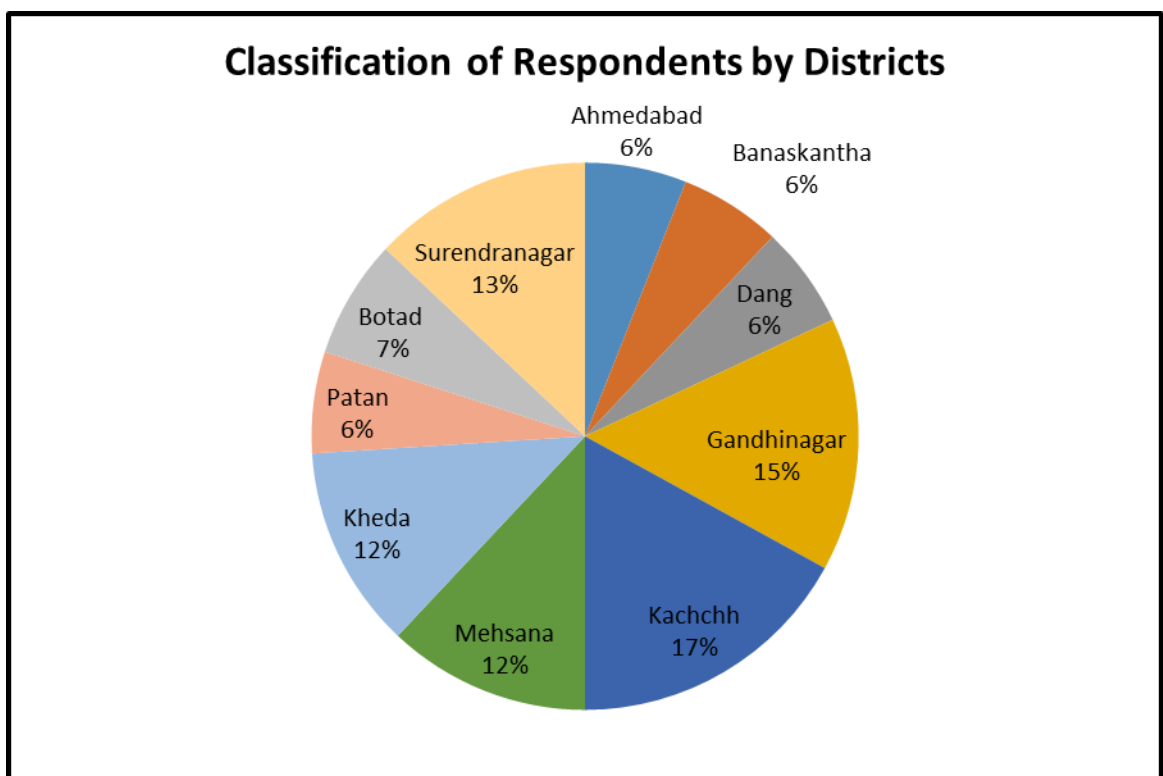
other implementation issues related to projects. One focus group discussion has been organized in each village involving 15 to 20 beneficiaries of the program.

The data collection during the study will be analyzed using various statistical tools like frequency distribution, descriptive statistics, graphs, chi-square, ANOVA etc. Statistical software SPSS and Excel will be used for the purpose of analysis.

#### **Classification of Respondents by Districts**

<b>Classification of Respondents by Districts</b>		
Districts	Frequency	Percent
Ahmedabad	6	6.0
Banaskantha	6	6.0
Dang	6	6.0
Gandhinagar	15	15.0
Kachchh	17	17.0
Mehsana	12	12.0
Kheda	12	12.0
Patan	6	6.0
Botad	7	7.0
Surendranagar	13	13.0
Total	100	100.0

Table 1.1



The classification of respondents selected for the purpose of study by district is presented in table and graph above. It can be seen from the data that nearly 17 percent respondents were selected from Kachchh while 15 percent were from Gandhinagar. Districts like Kalol and Kheda constituted around 12 percent respondents. In all total ten districts from various directions were covered by the study.



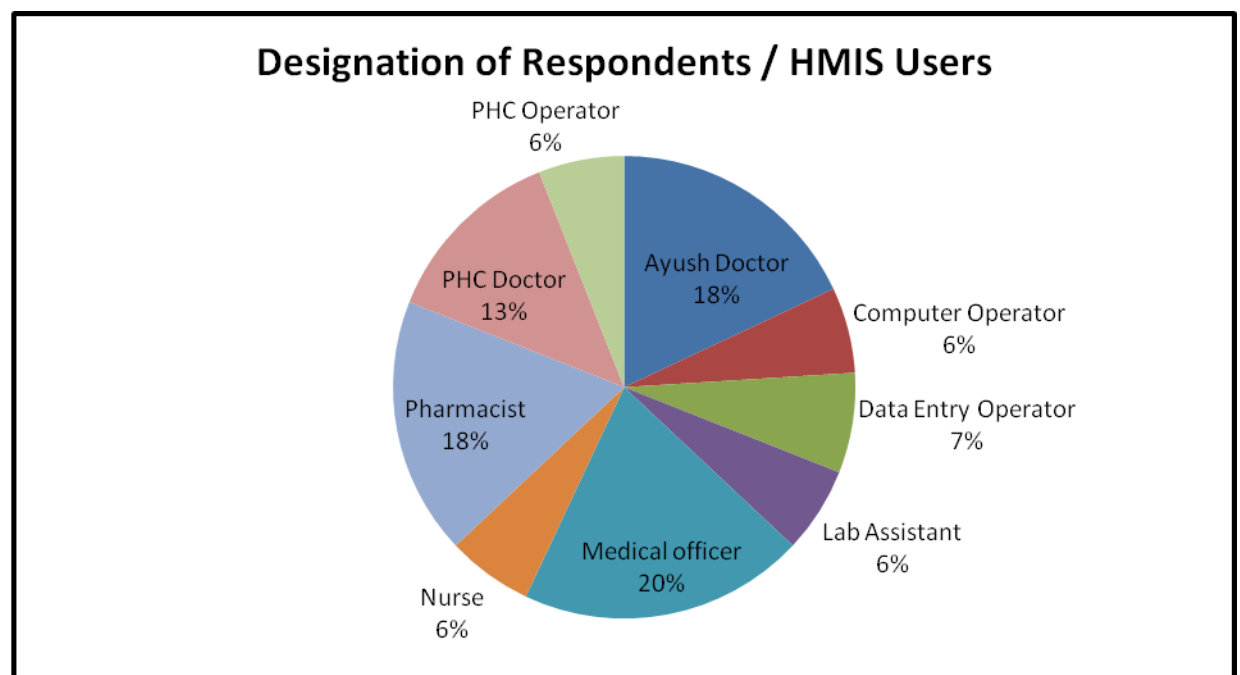
### Classification by Designation

The use of HMIS at primary health centre level was not limited to persons with specific designation. Users of HMIS vary across primary health centers covered in the study. The classification of respondents by their designation is presented in table and graph below.

It is evident from the data that in majority of cases HMIS is used by Medical officers followed by Pharmacist. Nearly 20 percent respondents included in the survey were Medical officers, followed by 18 percent Pharmacists and Ayush doctors, and 12 percent PHC Doctor.

Table 1.2

Designation of Respondents / HMIS User		
Designation	Frequency	Percent
Ayush Doctor	18	18.0
Computer Operator	6	6.0
Data Entry Operator	7	7.0
Lab Assistant	6	6.0
Medical officer	20	20.0
Nurse	6	6.0
Pharmacist	18	18.0
PHC Doctor	13	13.0
PHC Operator	6	6.0
Total	100	100.0



### Awareness and Training of HMIS

One of the objectives of the study was to know the level of awareness about HMIS among users of system working with PHCs. The information about awareness about HMIS among respondents as presented in the table and graph below indicates that 88

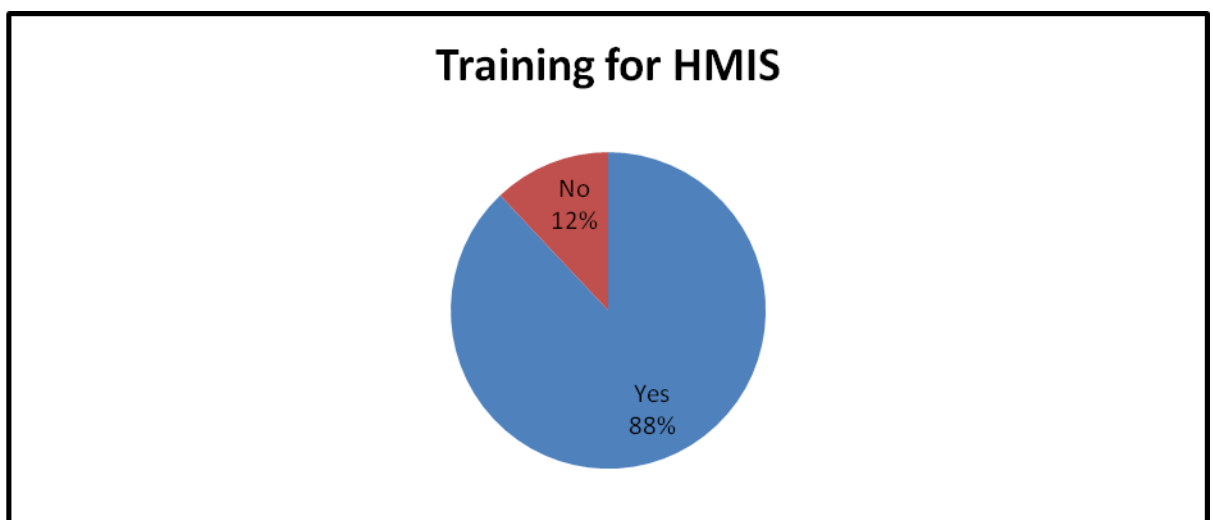
percent respondents have agreed that they are aware about HMIS while 12 percent respondents have accepted that they are partially aware about HMIS system.

<b>Awareness about HMIS</b>		
	Frequency	Percent
Yes (Fully Aware)	88	88.0
Partially (Somewhat Aware)	12	12.0
Total	100	100.0

Table 1.3

<b>Taken Training for HMIS</b>		
Taken Training for HMIS	Frequency	Percent
Yes	88	88.0
No	12	12.0
Total	100	100.0

Table 1.4



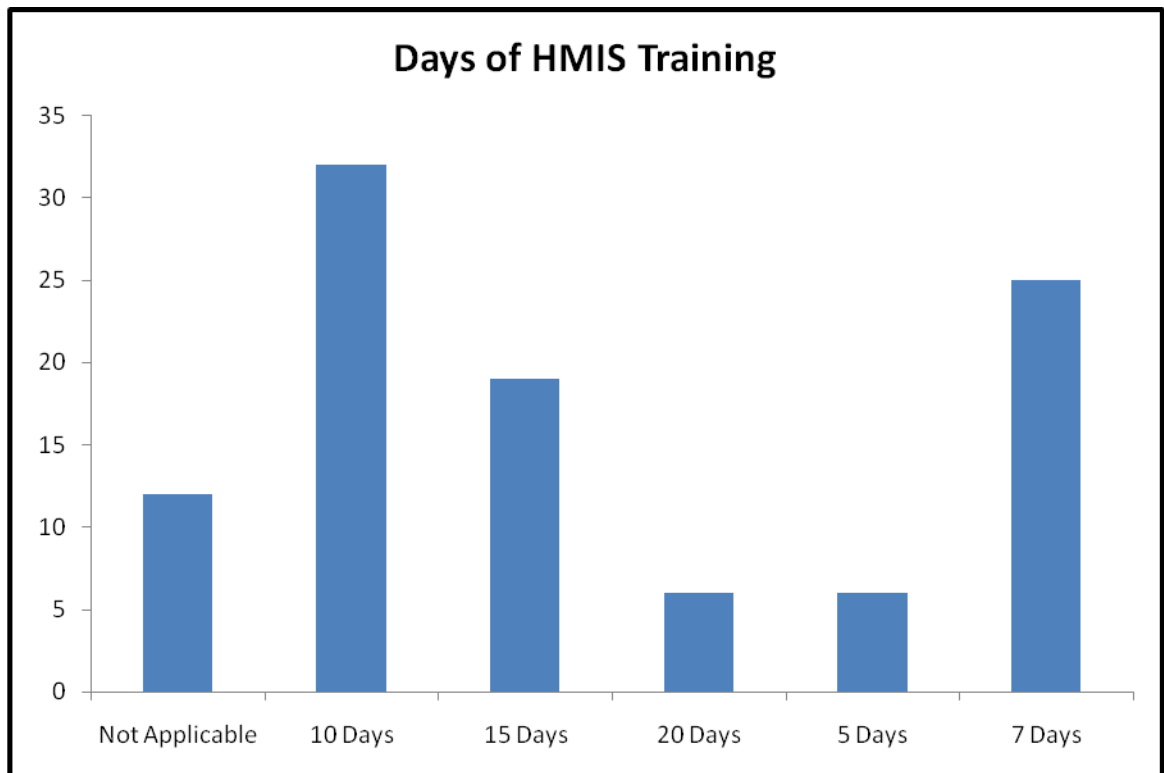
With regards to training about HMIS, the results of the survey shows that nearly 88 percent respondents have received training about HMIS system while 12 percent respondents have not received any formal training about HMIS. Respondents who have reported to have taken training on HMIS were also asked question about duration of their training. The information received from HMIS users about duration of their training is presented below;

Table 1.5

<b>Days of Training</b>		
	Frequency	Percent
Not Applicable	12	12.0
10	32	32.0
15	19	19.0
20	6	6.0
5	6	6.0
7	25	25.0
Total	100	100.0



Table 1.5



The data shows that largest numbers of respondents have received training for the duration of 10 days followed by 7 days. Thus training period of 7 to 10 days is most popular for training on HMIS.

#### Most widely used functions of HMIS

Most Widely used functions of HMIS	Percentage of Respondents
Purchase	100
Complaints and Redressal	100
Information Kiosk	100
Store/Inventory	100
Clinical/EMR	100
Nursing Care	100
NABH (National Accreditation Board for Hospitals and Health Care)	100
MIS	100
Laboratory	100
RKS (RogiKalyanSamiti)	100
Blood Bank	100

Table 1.6

The list of universally used functions of HMIS is presented in table above. The list shows the operations which are handled by all the respondents included in the survey with the help of HMIS.

On the other hand the functions which are not used by all the respondents are presented in table below;

Least used HMIS Functions	
HMIS Operations	Percentage of Respondents
Payroll	76
Financial Accounting	82
Equipment Maintenance	88
Resource Scheduling	88
Transportation	88
Linen Management	88
Human Resource	88
Hospital Admin	88

Table 1.7

The list of operations of HMIS which are used by least number of respondents is presented above which shows that use of HMIS for Payroll is least among all the major operations covered under the study followed by use of HMIS for financial accounting. Other operations of HMIS which are not so popular among user included equipment maintenance, resource scheduling, transportation, linen management, human resources, and hospital administration.

#### Level of Satisfaction with HMIS

After collecting information about uses of various functions/operations of HMIS, study intend to collect information about the level of satisfaction among users with regard to particular function. The information about the level of satisfaction with the use of HMIS as collected during the survey shows that 56 percent users are fully satisfied with the use of HMIS while 44 percent respondents are partially (Somewhat) satisfied with HMIS. Study does not find any users reporting dissatisfaction with the use of HMIS.

Satisfaction with the use of HMIS		
	Frequency	Percent
Fully Satisfied	56	56.0
Partially Satisfied	44	44.0
Total	100	100.0

Table 1.8

In order to measure the level of satisfaction with use of HMIS across various functions available in HMIS, five point scales was developed.

Satisfaction with HMIS	
Parameter	Mean Satisfaction Level
Payroll	2.2763
Financial Accounting	2.6951
Bio Medical Waste	3.0851
Special Camps and Training	3.1277
Equipment Maintenance	3.2386
Application security	3.2766
Resource Scheduling	3.2841

Transportation	3.4205
Linen Management	3.4318
National Program	3.4468
Human Resource	3.5227
Purchase	3.5600
Complaints and Redresses	3.5700
Patient Education	3.6809
Ward	3.7234
EIS Report	3.7447
Information Kiosk	3.7700
Billing	3.7872
Store/Inventory	3.8100
Hospital Admin	4.0000
Clinical/EMR	4.0100
Nursing Care	4.0600
Registration	4.0851
NABH (National Accreditation Board for Hospitals and Health Care)	4.1300
MIS	4.1300
Pharmacy	4.1809
Laboratory	4.3100
RKS (RogiKalyanSamiti)	4.3200
Blood Bank	4.3900

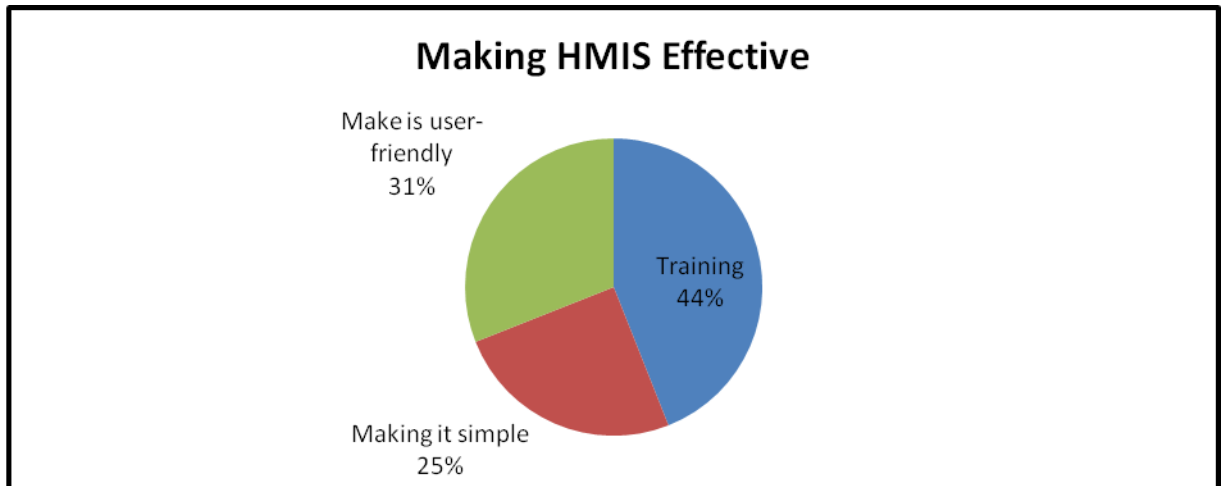
Table 1.9

It can be seen from the data that the level of satisfaction varies across various parameters of HMIS. Users of HMIS included in the survey were highly satisfied with Payroll (among those who are using this function of HMIS), Financial Accounting, Bio Medical Waste, Special Camps and Training, Equipment Maintenance etc as indicated by lowest mean score. On the other hand users seem very dissatisfied with Blood Bank, RKS (RogiKalyanSamiti), Laboratory, Pharmacy, MIS and NABH (National Accreditation Board for Hospitals and Health Care). The difference in satisfaction level among various parameters of HMIS reflects to up the need for improvement in terms of making it more useful and effective.

Users of HMIS were also asked question about measures to make the system more effective. The perception of respondents in terms of ways and means to make HMIS more effective is presented in the table and graph below.

Making HMIS Effective		
User need	Responses	
	N	Percent
Training	44	44.0%
Making it simple	25	25.0%
Make is user-friendly	31	31.0%
Total	100	100.0%

Table 1.10



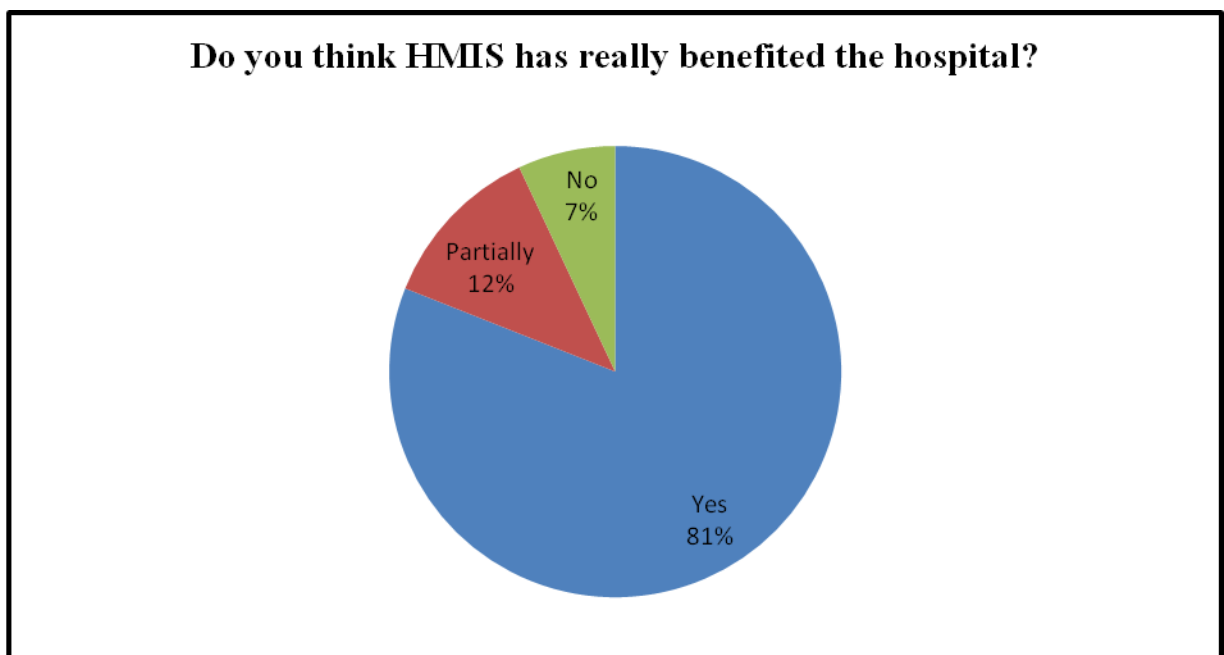
It is evident from the data that in order to make HMIS more effective largest number (44 percent) respondents have suggested for training program. At the same time nearly 31 percent have made a suggestion to make HMIS user friendly while 25 percent have requested to make the system simple. Thus training is most important for making HMIS effective.

#### Benefits of HMIS

The main objective of HMIS system was to make it effective in terms of benefits to hospital and society.

Do you think HMIS has really benefited the hospital?		
	Frequency	Percent
Yes	81	81.0
Partially	12	12.0
No	7	7.0
Total	100	100.0

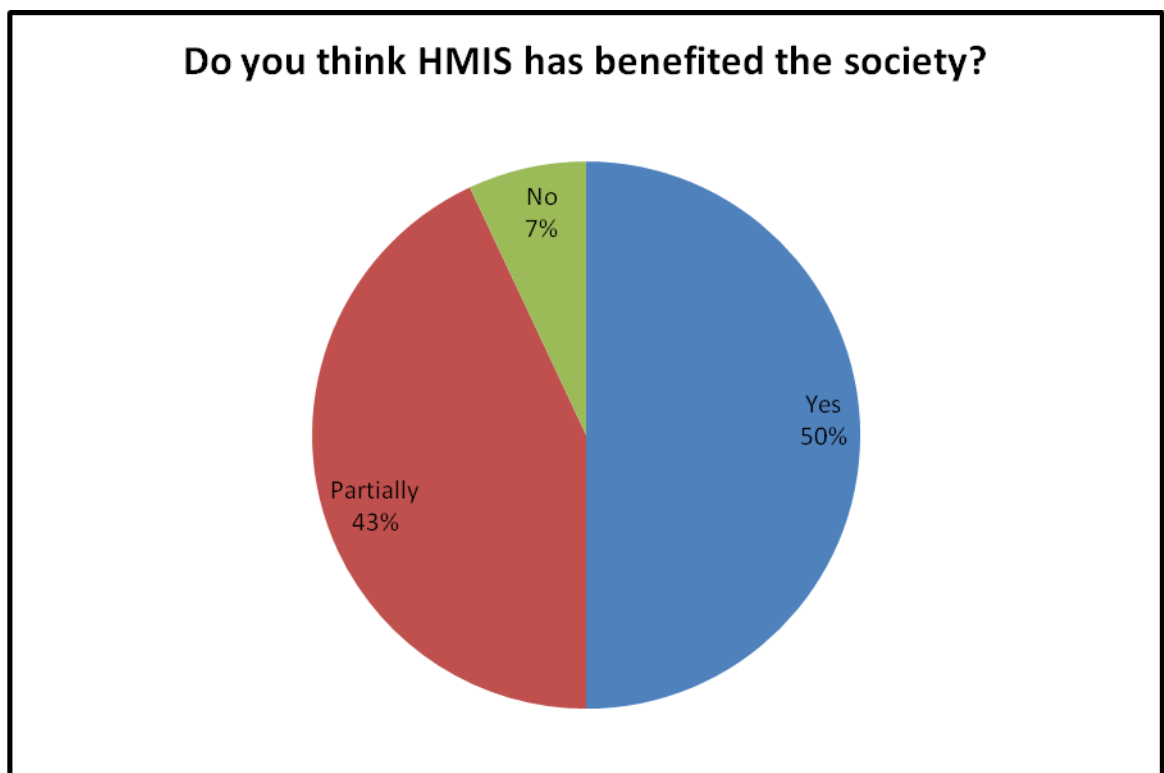
Table 1.11



Respondents of the study were asked about their perception on benefits of HMIS to hospital and society. The results of the study show that 81 percent respondents have reported that HMIS has beneficial to hospital. Only about 7 percent respondents have presented their view that HMIS has not benefited the hospital.

Do you think HMIS has benefited the society?		
	Frequency	Percent
Yes	50	50.0
Partially	43	43.0
No	7	7.0
Total	100	100.0

Table 1.12



About benefit of HMIS to society, perception of respondents show that 50 percent respondents have reported that HMIS has benefited the society while 43 percent have reported that it has partially benefited the society. Around 7 percent respondents have presented their view that HMIS has not benefited the society.

**Findings.**

- HMIS is used by health professionals across various designations. Users of HMIS include doctors, computer operators, lab assistants, medical officers, nurses, data entry operators etc.
- Users of HMIS are mostly young people in the age group of below 40 years of age.
- The proportion of male is more than that of female among users of HMIS
- More than 75 percent users of HMIS belong to general categories.

- Nearly 68 percent users of HMIS are graduate. The proportion of post graduate is less.
- Nearly 12 percent of HMIS users have reported that they do not have computer knowledge in terms of having degree in computer subject.
- More than 35 percent users of HMIS are using the system since less than 3 years which indicates lack of experience in using HMIS system.
- 43 percent users of HMIS have reported that they are working on contract and not on permanent basis.
- Largest number of respondents included in the survey reported that they are drawing monthly salary of 16500.
- Nearly 35 percent respondents have reported that their experience of working with PHCs is less than 3 years.
- Nearly 12 percent respondents have reported that they are fully aware with HMIS system and they know only part of the system.
- Nearly 12 percent respondents have not taken any training on HMIS while 88 percent have taken training on HMIS. Nearly 32 percent have reported that they have taken training on HMIS for a duration of 10 days while 19 percent have reported training period of 15 days.
- Among all users of HMIS 56 percent have reported that they are fully satisfied while 44 percent are partially satisfied with HMIS.
- In order to measure the level of satisfaction across various functions of HMIS, five point scales has been developed. Reliability of the scale has been tested using Cronbach's Alpha.
- Users of HMIS are highly satisfied with Payroll, Financial Accounting, Bio Medical Waste Literam Special Camps and Training etc.
- Users of HMIS are highly dissatisfied with Pharmacy, Laboratory, RKS (Rogi Kalyan Samiti), Blood Bank etc.
- Among the measures to make HMIS effective, largest numbers of respondents have reported need for training and need to make it user friendly.
- More than 80 percent respondents have reported that HMIS is really beneficial to hospitals while 50 percent have reported that it is beneficial to society.

### **Conclusion**

Governing with the assistance of ICT is called e-Governance. A comprehensive definition of electronic governance, given by the Council of Europe covers the use of electronic technologies in three areas of public action – relations between the public authorities and civil society, functioning of the public authorities at all stages of the democratic process (electronic democracy) and the provision of public services (electronic public service). GHMIS helps in monitoring pre-defined health indicators which helps to have informed decision making at the state level for policy and strategic decision. Looking at all the three areas stated, it is commonly believed that the government sector in India has not delivered in terms of e-Governance, despite huge budgetary allocation. Registration of property, railway reservation, electricity

and water billing, examinations results, birth / death certificates, educational admissions, land records, taxation, domicile certificate, and driving license are some of the e-governance projects which have been initiated in the recent past. Some of these are useful to citizens but their impact is low in terms of transparency, ease of use, availability, information dissemination and integration. If we compare similar applications in advanced countries, our CCEG (Citizen Centric E-Governance) projects seem to lag in terms of their impact on the society. By and large, citizens from all segments of the society are confused as to whom to approach for solving their problems. Number of independent web-sites exist but, still cannot be used as a reliable source for government level information. Since services are not integrated (for instance, registration of property and maintenance of land records), citizens have to face problems arising out of data inconsistency.

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