

CHAPTER V
RESEARCH RESULTS

1. DEMOGRAPHY

Data were collected by questionnaire from 18 September 1992 until 26 November 1992 at 8 central hospitals and institutes with bed in Hanoi, among which, 3 (37.5%) were general and 5 (62.5%) were specialized.

The numbers of inpatient beds range from 50 to 550 and the numbers of OPD beds range from 0 to 50. The numbers of inpatients and outpatients in those hospitals vary from 0 to 400 and from 80 to 350 per day respectively.

Total of subjects was 51 of which 7 subjects (13.7%) could not be interviewed since they were neither present nor willing to answer. The rest, 44 respondents consist of 9 hospital leaders (20.5%), 12 pharmacy heads (27.3%), 9 medical service heads (20.5%), 14 OPD heads (32.2%).

Daily work that those managers handled distributed in Table

Table 5.1

Daily Works of Hospital Managers

Task	Percentage
Statistics	77.3%
Planning	70.5%
Drug management	68.2%
Word processed	65.9%
Manpower	63.6%
Patient medical record	61.4%
Equipment	52.3%
Medical research	52.3%
Finance	34.4%
Accounting	20.5%
Other	31.8%

Statistics, planning and drug management are the 3 work areas that managers handle most often. About 7 of 10 hospital managers are involved in those 3 works.

The next are word processing, management of manpower and patient medical record.



Statistics work refers to statistics on patients' information e.g sex, age, diseases, death causes; man power and facilities utilization; pharmaceutical statistics; budget utilization; data on professional activities such as operation, examination or treatment etc. Those data are collected directly from routine work or indirectly from reports of other divisions.

Planning work includes of the control of information about planning indicators e.g money, beds, staff and other resources; the estimation of work fulfilled; the prediction of requirements on human, materials, equipment, of number of patients to the hospital etc. Planning work also consists of staffing and employee scheduling; outpatient appointment; examining and operation scheduling, drug stock plan etc.

2. ESSENTIAL INFORMATION FOR HOSPITAL LEADERS AND MANAGERS

2.1 Essential information in general

Using non-parametric *Kendall's t*-test for multi-related variables, the main types of information are ranked by their importance to hospital managers as follows :

Table 5.2

**Mean of Rank Score of Essential Information
in General for Central Hospitals**

	Mean Rank
1- Drug control	8.34
2- Plan	8.11
3- Bed control	7.61
4- Statistics	7.48
5- Equipment	7.13
6- Staffing scheduling	7.06
7- Patient registration data	6.82
8- Medical record	5.90
9- Financing and Accounting	5.77
10-Medical information	5.58
11-Patient scheduling	4.49
12-Word processed	3.72

Kendall's nonparametric test: $w=.1687$, Chi-square = 81.6449,

$p < 0.001$

The test shows that there is a statistically significant difference between those types of information. Drug control is considered as being the top for critical information. It seems contrary

to the approach of some pilot programme of computerization at the present in several hospitals in Vietnam. In those hospitals, often the management of medical record is computerized first. To explain this happening, we need to come back to the unequation of change in Chapter 1. We all know that drug management is so complicated and sophisticated, especially the variable list of drugs, their price and their new product, that computer programmer avoid this field. The highest mean rank reflects the urgent need to computerize the hospital pharmacy management, where managers often get a lot of difficulties in controlling hundreds of kinds of drug manually in thousands of drug descriptions per day.

The second important item is the information of plan. Bed control, statistics, equipment management and staff scheduling are the next. Word processing is ranked at the bottom. It is remarkable if we notice that in many places, a computer is commonly used to present beautiful a document.

Further stratified analysis proves that the essential information for each subject depends on his post.

2.2 Essential Information for Medical Record Head

The Medical Record division (sometimes also namely as *the Medical Service Division* or *the Planning and Synthesis Division*) is the second and last place where patients contact hospital. People, after diagnosed by the Examining Division, register at the Medical Service

Division and before they leave the hospital, their document and medical records are also kept there.

Besides managing patient's medical record, the division is also the unit in charge of planning and collecting statistic data. In many hospital, computer is used in this place foremost. To answer the question "*Prioritize the below information by their importance to your daily work*", we have the result in Table 5.3.



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Table 5.3

ESSENTIAL INFORMATION FOR MEDICAL RECORD HEAD
(ranked by priority)

	Mean Rank
1- Bed control	9.58
2- Statistics	8.72
3- Medical record	8.33
4- Patient registration data	7.89
5- Plan	7.83
6- Drug control	6.50
7- Equipment	5.89
8- Patient scheduling	5.72
9- Financing and Accounting	5.17
10-Medical information	5.00
11-Staffing scheduling	4.33
12-Word processed	3.06

Kendall's nonparametric test: $w=.3207$, Chi-square = 31.7529,

p <0.001

Bed control is the first crucial information. The staffs in this division need to know information about empty bed in order to admit inpatient. The indicator of bed utilization is an important indicator to evaluate the hospital activity.

Coming next are statistical data, medical record, patient registration data and plan information.

2.3 Essential Information for Pharmacy Head

It is data of planning, statistics and staff schedule which are critical information to pharmacy managers, after drug control. As indicated in the section 8, chapter 4, information of drug management is considered one of the most essential and difficult task to do in hospital. Due to the numerous numbers of drugs and their new patent medicine, pharmacists and managers could hardly summing the volume of daily used drug and its balance in stock.



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Table 5.4

ESSENTIAL INFORMATION FOR PHARMACY HEAD

(ranked by priority)

	Mean Rank
1- Drug control	10.88
2- Plan	9.42
3- Statistics	8.33
4- Staff scheduling	8.25
5- Financing and Accounting	7.67
6- Bed control	6.83
7- Medical information	6.54
8- Equipment	6.54
9- Patient registration data	4.75
10-Word processed	3.42
11-Medical record	2.83
12-Patient scheduling	2.54

Kendall's nonparametric test: $w=0.5943$, Chi-square = 78.4425,

$p < 0.001$

2.4 Essential Information for OPD and Examining Head

Table 5.5

ESSENTIAL INFORMATION FOR OPD HEAD

(ranked by priority)

	Mean Rank
1- Medical record	8.65
2- Employee staffing scheduling	8.25
3- Equipment	7.80
4- Patient registration	7.70
5- Drug control	7.60
6- Medical information	7.35
7- Plan	7.20
8- Statistics	6.95
9- Patient scheduling	6.35
10-Bed control	5.55
11-Financing and Accounting	2.50
12-Word processed	2.25

Kendall's nonparametric test: $w=.3559$, Chi-square = 39.1515,

$p < 0.001$

OPD and examining division is the first place that communicates with people. It plays a very important role to make an image of the

hospital. People, through this division, are examined and divided into three categories :

- Accepted to be Outpatient
- Admitted to be Inpatient
- Referred to other hospital

Needed information are ranked by their importance is shown in Table 5.5.

3. VOLUME OF INFORMATION

3.1 Volume of Information in General

As displayed in Table 5.6, patient's record is the greatest data in hospital management in terms of both daily volume and duration of keeping. If we calculate 1,000 characters equivalent to 1 kilobytes and suppose that medical record is the work applying computer, then every 3 days, a hospital will need a 360 KB floppy to store new raw data and a computer with 350 MB hard disk to keep historic patient data. Of course, with computer technic we don't need to have such a big hard disk, we can segment data into smaller parts, say by year so that we will share the hard disk for other purpose.

Table 5.6

**Average Volume of Daily and Accumulate Data in
a Central Hospital**
(in thousand characters)

	Mean	± SEM	year to keep	VDS*
1. Patient record	138.18	18.40	10.6	380700
2. Patient examination	91.46	12.47	1.6	111325
3. Patient Appointment	19.25	1.32	0.0	5400
4. Patient admission	78.05	10.25	10.0	171891
5. Patient exit	12.47	1.69	7.5	13066
6. Bed control	1.56	.22	1.0	200
7. Surgery report	44.38	11.33	3.0	9400
8. Drug description	119.51	16.38	5.4	291504
9. Drug-in	13.90	3.91	4.0	13300
10. Drug inventory	12.27	2.33	4.3	24450
11. Drug-out	94.00	15.28	4.6	110800
12. Word processed	1.93	.40	10.6	5150
Total				1118232

VDS* : Total volume of data to storage



3.2 Volume of Information in the Medical Record Division

Table 5.7

Daily Data and Accumulate Data in Medical Record Division


(in thousand characters)

	Mean	± SEM	year to keep	VDS*
1. Patient record	113.68	18.40	10.6	350500
2. Patient examination	39.38	12.47	1.6	47500
3. Patient Appointment	3.75	1.32	0.0	0
4. Patient admission	47.43	10.25	10.0	132666
5. Patient exit	11.29	1.69	7.5	12166
6. Bed control	1.29	.22	1.0	200
7. Surgery report	35.43	11.33	3.0	8200
8. Drug description	11.71	10.60	5.4	8954
9. Drug-in	0.00	-	-	0
10. Drug inventory	0.00	-	-	0
11. Drug-out	0.00	-	-	0
12. Word processed	1.33	.40	10.6	4000
Total				552566

VDS* : Total volume of data to storage

VDS = Volume of Data x Duration to keep data

Besides medical record that takes the top position in terms of daily handled (113.68 ± 18.40 KB) and accumulate stored (350,500 KB), Patient admission (47.43 ± 10.25 KB and 132,666 KB respectively) and patient examination information (39.38 ± 12.47 KB and 47,500KB) are the two items that have a considerable volme of VD and VDS.



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

3.3 Volume of Information in the Pharmacy Division

Table 5.8

Daily and Accumulate Data in Pharmacy Division
(in thousand characters)

	Mean	± SEM	year to keep	VDS*
1. Patient record	0.50	0.13	5.0	650
2. Patient examination	3.08	2.75	5.0	1875
3. Patient Appointment	0.00	-	-	0
4. Patient admission	0.42	0.31	3.0	375
5. Patient exit	.08	0.06	-	0
6. Bed control	0.17	0.12	-	0
7. Surgery report	0.25	0.16	-	0
8. Drug description	86.50	23.41	15.0	270450
9. Drug-in	13.50	0.25	5.0	12700
10. Drug inventory	12.17	1.24	10.0	24300
11. Drug-out	94.00	38.14	5.0	110800
12. Word processed	0.50	0.33	3.0	1000
Total				422150

VDS* : Total volume of data to storage

VDS = Volume of Data x Duration to keep data

3.4 Volume of Information in the OPD and Examining Division

Table 5.9

Daily and Accumulate Data in OPD and Examining Division

(in thousand characters)

	Mean	± SEM	year to keep	VDS*
1. Patient record	24.00	10.02	10.0	29550
2. Patient examination	49.00	23.51	15.0	61950
3. Patient Appointment	15.50	3.33	15.0	5400
4. Patient admission	30.20	5.03	15.0	38850
5. Patient exit	1.10	1.02	5.0	900
6. Bed control	0.10	0.14	0.0	0
7. Surgery report	8.70	7.37	5.0	1200
8. Drug description	21.30	3.79	5.0	2100
9. Drug-in	0.40	0.43	5.0	600
10. Drug inventory	0.10	0.14	5.0	150
11. Drug-out	0.00	-	0.0	0
12. Word processed	0.10	0.14	1.0	150
Total				140850

VDS* : Total volume of data to storage

VDS = Volume of Data x Duration to keep data

4. METHOD TO COLLECT INFORMATION

4.1 Media to provide information

Table 5.10

Media to Provide Information (%)

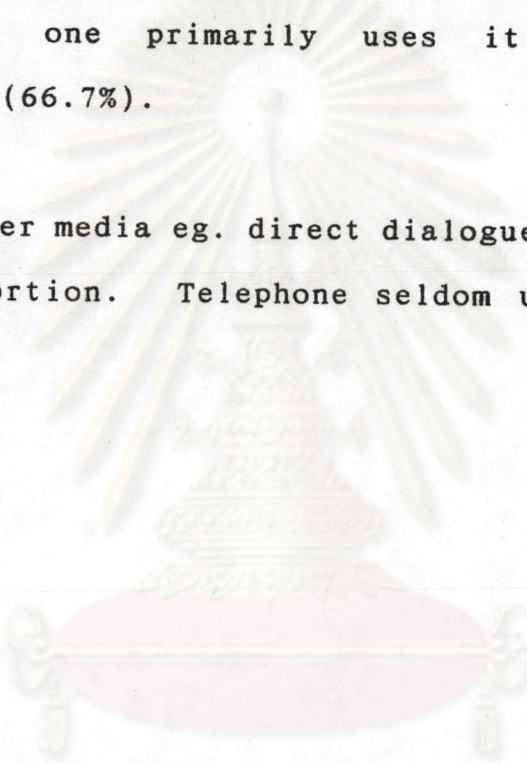
Information	Logbook	Report	Document	Dialogue	Other
Medical Rec.	43.7	56.3	31.3	6.3	18.8
Patient examination	40.0	20.0	50.0	0.0	0.0
OPD schedule	50.0	25.0	25.0	0.0	0.0
Patient Admit.	55.6	33.3	66.7	0.0	11.1
Patient exit	50.0	25.0	75.0	25.0	0.0
Bed control	33.3	0.0	33.3	33.3	0.0
Surgery control	33.3	16.7	50.0	33.3	0.0
Drug description	18.2	45.5	63.6	0.0	0.0
Drug in	0.0	33.3	66.7	0.0	0.0
Drug inventory	66.7	33.3	16.7	0.0	0.0
Drug out	0.0	40.0	60.0	0.0	0.0
Word processed	0.0	25.0	68.8	0.0	0.0

At the moment, documents and reports are used as the most popular method to provide and keep information.

They consist of patient medical record, examining result, testing result, report from wards, etc.

Logbook comes next (about 50%), utilized most to follow up outpatient, admission and discharge of inpatient. Especially, one primarily uses it in the pharmacy department (66.7%).

Other media eg. direct dialogue, computer weight a small proportion. Telephone seldom used in information management.



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

4.2 The Order to File Information (%)

Table 5.11

Method to File Information (%)

Information	Alphabetic	Date	Last copy	Bed	Division	Other
Medical Rec.	21.3	64.3	35.7	7.1	35.7	14.3
Patient examination	0.0	55.6	33.3	0.0	22.2	0.0
OPD schedule	0.0	25.0	25.0	0.0	50.0	0.0
Patient Admit.	22.2	66.7	22.2	0.0	22.2	11.1
Patient exit	0.0	66.7	0.0	0.0	0.0	33.3
Bed control	0.0	100.0	0.0	0.0	0.0	0.0
Surgery control	25.0	75.0	0.0	0.0	0.0	0.0
Drug description	11.1	55.6	11.1	0.0	11.1	11.1
Drug in	0.0	66.7	16.7	0.0	16.7	0.0
Drug inventory	16.7	83.3	0.0	0.0	0.0	0.0
Drug out	0.0	87.5	12.5	0.0	0.0	0.0
Word processed	0.0	87.5	6.3	0.0	6.3	25.0

Method of storing the data is still very simple. The main order to file document is by date and last copy.

Order by division and ward weights about one third. Other order, such as by bed, disease code considerable is trivial. It is easy to realize that if one has to report some synthesis by hand, say number of cases of diabetes from some provinces to hospital, it will take much time.

5. REGRESSION ANALYSIS TO EVALUATE THE RELATION BETWEEN VOLUME OF DATA AND THE SIZE OF HOSPITAL

It is rather surprising that the volume of data to storage has no linear relation to number of bed. SPSS/PC package, somehow, reveals an other element that can relate to the volume of data. It is the number of OPD bed.

Two regression equations had been found as follows:

5.1 For the Whole Hospital

Drug information volume and OPD bed :

ศูนย์วิทยุโทรพยาธิกร
จุฬาลงกรณ์มหาวิทยาลัย

Table 5.12

Linear Regression Relation between Drug Information Volume and Number of OPD Beds

Variable	B	SE B	Beta	T	Sig.T
OPD bed number	37.084	11.52	0.459	0.0017	
(constant)	-18.602	1024.14		0.9856	

5.2 For the Medical Bibliography and Record Division

Data volume of outpatient appointment schedule and number of OPD beds :

Table 5.13

Linear Regression Relation between Information of Outpatient Appointment Schedule and Number of OPD Beds

Variable	B	SE B	Beta	T	Sig.T
OPD bed number	147.48	12.0	0.97	12.27	0.000
(constant)	-56.81	1158.3		-0.049	0.962