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PRODUCTIVITY
OF PRIMARY HEALTH CARE TEAMS
IN JAMAICA

by
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FINAL REPORT TO
PRIMARY HEALTH CARE OPERATIONS RESEARCH (PRICOR),
CENTER FOR HUMAN SERVICES (CHS)

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LIST OF ABBREVIATIONS

CHA	Community Health Aide
CWS	Critical work station
DMO	District Medical Officer
DMW	District Midwife
DSPM	Department of Social and Preventive Medicine
EN	Enrolled Nurse
FW	Fieldworker
HC	Health centre
HMIP	Health Management Improvement Project
Ja	Jamaica(n)
JPP	Jamaica Population Project
KSA	Kingston and St Andrew
MO	Medical Officer
MoH	Ministry of Health, (Jamaica)
n	number
No.	Number
NP	Nurse Practitioner
PHC	Primary health care
PHI	Public Health Inspector
PHN	Public Health Nurse
PRICOR	<u>PR</u> imary <u>H</u> ealth <u>C</u> are <u>O</u> perations <u>R</u> esearch
PWA	Price Waterhouse Associates
RC	Records Clerk
RN	Registered Nurse
T1	Type I (health centre)
T2	Type II (health centre)
T3	Type III (health centre)
T4	Type IV (health centre)
UWI	University of the West Indies
yr	year(s)

ABSTRACT

This report describes a study carried out by the Department of Social and Preventive Medicine, University of the West Indies (Mona), Jamaica (UWI), initiated by the Ministry of Health, Jamaica, with Price Waterhouse Associates (PWA) as collaborators, and funded by the Primary Health Care Operations Research Project of the Center for Human Services.

UWI and PWA were to describe productivity in the primary health care services of Jamaica. Subsequently PWA were to suggest strategies for improvement and assist the Ministry of Health in implementing chosen strategies. This report describes UWI's work, which was in the first stage of the project.

The Department of Social and Preventive Medicine was responsible for almost all the data collection and much of the analysis in the first stage; PWA suggested the basic ideas for study design. Results of data analysis were supplied to PWA according to their needs, and certain results are presented here both as a record of what took place, and for their usefulness in their own right.

Data collection was done throughout 1984, in a sample of 96 from the 375 primary health care centres in Jamaica, in all parishes of Jamaica.

Activities of a sample of 529 members of staff from the 96 health centres were observed for one day each. The mean percentage of time devoted by each category of staff to various activities such as patient care, administration, travelling, personal time, etc., is described. For most types of staff the mean percentage of unproductive time indicated that there was scope for improved management practices to increase time spent productively.

Patient flow in 44 general medical clinics was observed and is described for 465 patients. The mean times spent with each patient by doctors was 7 minutes. The mean time spent with patients by nurse practitioners was 11 minutes. Other staff spent a mean of 6 minutes with each patient. The mean time the patients spent at the health centres was 248 minutes. The patient flow was such that the doctors' and nurse practitioners' time was well utilised. Suggestions for reducing patients' waiting times are made.

Patient flow in 15 clinics served by dental surgeons is described. The mean time the patients spent at the health centres was 148 minutes. The mean time during which they were getting treatment from the dental surgeons was 4 minutes and, from other staff, 1 minute. The dentists' time was efficiently utilised. A suggestion is made for reducing patients' waiting times.

Data for several other types of clinics were collected but not analysed in the above ways, though the data were analysed to meet PWA's needs.

Enquiries were made at the 96 health centres concerning maintenance of equipment, and presence/quality/amount of certain facilities, utilities, drugs, supplies, pieces of equipment and furniture. Indices were constructed reflecting the status of each health centre in these respects. Mean indices were 42.6% for maintenance of equipment, 54.3% for facilities and utilities, 29.7% for drugs and supplies (for which the number of completed data collection schedules was low) and 59.1% for equipment and furniture.

All results provide baseline data with which future comparisons may be made, and information relevant to decision making in management. They indicate opportunities for improved management.

Based on results supplied by the UWI, PWA have made recommendations to the Ministry of Health regarding strategies for clinic scheduling and deployment of staff which should improve productivity. It is hoped that some of the strategies will be implemented and evaluated on a local scale in the near future.

I GENERAL INTRODUCTION

General background, Jamaica

Jamaica is a developing, tropical country in the Caribbean with a population of about 2.3 million persons, an area of 4,400 square miles, and a per capita income of Ja\$2550 (1983). About three quarters of a million people live and around the capital city of Kingston, the rest in the other city of Montego Bay or in other large and small towns, villages and scattered communities. The economy is based on agriculture, tourism, bauxite mining and a number of light industries. Health status has greatly improved this century, as indicated by declining IMRs - 175 per thousand in 1915, 102 in 1945, and 27 per thousand in 1980.

Development of present primary health care system

In the late 1960's, as a result of increasing concern in Jamaica in relation to the need for improved primary health care (PHC), a new system of PHC was developed and implemented by the Ministry of Health (MoH). A significant step towards this new system was the training and employment of a group of auxiliary health workers termed 'community health aides' (CHAs): these were women, mainly, with an interest in health work who were given a few weeks' training to enable them to help at health centres and to do routine home visiting, mainly in the monitoring of the health status of women and their young children and of chronically sick persons. After an initial pilot project in Portland and with the aid of the World Bank, many new health centres were built in the rural communities and townships of Western Jamaica, and further innovations in the organisation of the delivery of health care were made. As a result of informal evaluation of this system, the system was soon extended to cover the whole nation. By the end of the 1970's the PHC system was as described in the following 4 paragraphs.

The country was divided into 4 administrative 'areas', further into 13 'parishes' and further into 47 health 'districts' with about 375 health centres (HCs) altogether. The blueprint for such health districts was that they would serve a population of about 20,000 people, from 3 types of HCs.

The smallest and simplest HCs were termed 'Type I' (T1) and were designed to give basic maternal and child health (MCH) services and first aid, being staffed by a district midwife (DMW) and two or more CHAs.

Somewhat bigger than the T1 HC, and offering a greater variety of services, are the 'Type II' (T2) HCs, which have based there a public health nurse (PHN), a registered nurse (RN) and a public health inspector (PHI) and offer an increased range of services, this range of services being increased by periodic visits of a doctor (medical

officer, MO, or nurse practitioner (NP). (NPs are nurses given advanced training to enable them, under the supervision of a doctor, to diagnose and treat certain common conditions). T2 HCs serve populations of about 12,000 persons.

Type III (T3) HCs are yet more complex in staffing and services offered, having full time MOs and/or NPs and also clerical staff. A HC is termed 'Type IV' (T4) if it serves as the parish headquarters for the most senior medical, health, and administrative staff; the distinction between a T3 and T4 HC is the presence of the senior administrative staff in the T4, and for the purposes of the rest of this report they will be treated synonymously and termed T3.

Each T1 HC is linked organisationally to a T2, and each T2 to a T3. In each health district there are, therefore, administrative 'clusters' of T1-T2-T3 HCs. The linkages are brought about by the patient-referral system and by regularly scheduled visits of staff from the T3 or T2 HCs to the T2 and T1 HCs for the purposes of helping to conduct clinics, providing supervision and support, etc, and for administrative reasons. In practice, the organisational details of the PHC health services vary somewhat according to historical antecedents, type of terrain, quality of communications, population density and staff availability.

In each parish, one district, with a type III and one or more associated types II and I HCs, was designated a 'pilot' district. Such districts were chosen on the grounds of having fully equipped and staff health centres. It was intended that health planners could make periodic visits or otherwise review the work of the health centres as a means of evaluating the degree of success of the new system. In practice some review of this nature has been made in some health districts, but the pilot district health centres have suffered from subsequent shortages of staff, equipment and supplies and were not, at the time of the present study, necessarily 'model' health centres.

All the health centres schedule routine clinics on a daily, weekly, fortnightly or monthly basis, and the referral system within the PHC or to the secondary health care system is designed to give appropriate care to each person regardless of the initial entry point. Preventive and educational services are emphasised.

The fullest reference document to these services is one produced by the Ministry of health, Jamaica (1978). This also sets out the general philosophy of the PHC services and should be consulted by the interested reader.

By the early 1980's, then, this new system was in operation and was offering a system clearly compatible with the philosophy and aims of the Declaration of Alma-Ata (1978), as well as a system potentially applicable to other developing countries, and was thus attracting some international as well as local attention.

Need for present study

The new PHC system, whilst simple in concept, in practice was based on the interactions of many types of health workers functioning as teams made up of many different combinations, with different clinic schedules, and operating in varying circumstances regarding population served, population density, quality of communications, motivation of health staff and of patients/clients, and quality and availability of material resources.

The blueprint was drawn up according to the judgement of the planners at the time. The Ministry of Health was cognizant of the need for information about the running of the system, once it was put into operation, in order to review it and make appropriate changes vis-a-vis its improved functioning. Information about the efficiency of the running of the services, from a management point of view, was necessary for monitoring and evaluation of the services so that productivity could if possible be increased. This was the rationale for the present project.

Relationship between the Ministry of Health, The University of the West Indies and Price Waterhouse Associates

The initiative for the present project arose from the Health Management Improvement Project (HMIP) of the Ministry of Health (MoH). That project, as its name implies, had as its main aim the improvement of management of the health services. The HMIP Project Manager approached the Department of Social and Preventive Medicine (DSPM) of the University of the West Indies (UWI) for possible help in obtaining certain information to assist HMIP in its management exercises. This initiative eventually led to an agreement between Primary Health Care Operations Research (PRICOR) and UWI to conduct the project "Productivity of Primary Health Care Teams in Jamaica". At the same time, it was realised that help in certain technical/management aspects of the work would be needed, and a separate contract was thus signed between PRICOR and Price Waterhouse Associates (PWA). UWI and PWA were to collaborate, according to their respective skills and resources, on what was essentially one project.

As initially intended, UWI and PWA have collaborated closely to arrive at the final results. This report describes in detail the parts of the work in which UWI has had the main responsibility and briefly refers to the role of PWA. PWA will describe their work in a separate report.

II DISTRIBUTION OF TIME SPENT IN VARIOUS ACTIVITIES BY STAFF OF HEALTH CENTRES

Introduction

The aims of the work described in this section were to describe how the various categories of health personnel apportion their working time to various types of activities, to compare pilot and non-pilot HCs in this respect, to compare types 1-2-3 HCs, to compare the 4 health administrative areas and to compare HCs in urban and rural locations. HMIP lacked this type of documentation of activity in PHC and requested this information as base-line data to have at its disposal in working towards improved management of the PHC services.

For the work described in this section, PWA suggested the 'job sampling' (work sampling) methodology. Actual details of the methodology and all parts of pretesting, data collection, sampling of HCs and analysis of data were by UNI. The results were requested in their own right by HMIP, and some details of the results were required and used by PWA in their measurement of productivity and cost-effectiveness indices.

Methods

Data collection was carried out between January 1984 and October 1984, on a parish-by-parish basis. Pretesting of data collection instruments had been done in November, 1983, in the Kingston and St Andrew (KSA) area.

Sampling of HCs was made on a cluster/stratified random basis, as follows. A cluster will refer to a randomly selected T3 HC from a given stratum, along with one T2 chosen randomly from all its associated T2s, and along with one T1 chosen randomly from all the T1s associated with the chosen T2. In each parish (n=13), except the combined parishes of KSA, one cluster of 3 HCs was chosen from the pilot district and one cluster of 3 HCs was chosen from the non-pilot districts. In KSA, 1 cluster from the pilot district and 2 clusters from non-pilot districts were chosen. To facilitate urban/rural comparisons, a further selection of 2 clusters from KSA and 4 from the next-largest urban communities were chosen.

This sampling technique should have yielded 99 HCs, but on three occasions there were no HCs fitting the criteria (the organisation of the services was not strictly according to the general plan), so there were 96 HCs in the final sample. Although this paragraph indicates random choices, there were occasions when there was only 1 possible choice of HC in a stratum so such a HC had to be automatically included.

Appropriate senior officials at the MoH were informed and consulted at all stages of the project. In all parishes, preliminary meetings of

senior project staff with senior parish staff were held so that the purposes and methodology of the project could be explained and discussed. The senior parish staff were to explain to the staff of the selected health centres that they were to be a part of this study, and to request their cooperation. Later, but still prior to actual data collection, the project staff explained their presence and purpose to the staff of the selected health centres both verbally and by a hand-out. The explanation was full and honest, and the cooperation of the staff was requested.

After some preliminary visits and pretesting at HCs in the Kingston area, in November, 1983, the various types of work done by health staff were categorised by the study designers as follows:

- 01 Directly involving patients
- 02 Administration in health centre
- 03 Leave (occurring at short notice)
- 04 Organised in-service training
- 05 Meetings
- 06 Supervision
- 07 Advance preparation, later tidying
- 08 Travelling
- 09 Waiting for work to begin
- 10 Forced inactivity (except 9 above and 11 below)
- 11 Forced inactivity - lack of demand
- 12 Other inactivity - personal 'down time'.

In the light of early practical experience the following were added to the list:

- 13 Activities indirectly involving patients
- 14 Public health activities (This was added to describe aspects of the work of public health inspectors)
- 77 Absent for part of day, not on leave (not yet arrived, or left work already)
- 88 Absent for whole day (reason for absence not known to health staff who were present)

Examples of activities which fell into each of these categories are listed in Appendix 1.

A senior person at each HC was interviewed in order to provide the study with information on names of staff based there full-time (Appendix 2) and their usual deployment. A sample of staff was then selected, comprising one of each category of worker based at that HC and full-time employed: when there was only 1 such person, he/she automatically became part of the sample; when there were 2 or more such people, 1 of them was randomly chosen to become part of the sample.

It was explained to the staff and to the selected individuals that in the near future a field assistant to the project was likely to visit the HC in order to observe them at work. The exact day on which this was to happen was not specified. Field assistants were assigned to observe the selected staff on a random basis where possible with respect to choice of field assistant, choice of day (Monday to Friday) and choice of health worker, but subject to the general need to keep most field assistants employed on most days of the week on a geographically convenient basis.

The field assistants employed to the project numbered 75. They usually were assigned to work conveniently close to their own homes and hence the team changed from region to region throughout the island. They were largely health-trained technical or professional persons, many on temporary leave and some retired from the health services. They were given a few days' training at a convenient location and performed practice observations at HCs until the quality of their work was thought adequate by senior project staff. The need for honesty, confidentiality and tact was carefully explained during training. A manual was prepared to help the trainees.

The trained field assistants completed observations of the selected health staff by the 'job sampling' technique. They used a prepared sheet (Appendix 3) which listed down the left side 60 randomly-chosen 1-minute intervals between the times of 8.00 a.m. and 4.30 p.m. At the stated times, they observed the health staff member to see what he/she was doing during that 1-minute interval and described this activity by writing on the observation sheet a verbal phrase and a numerical code according to the list given as above and as Appendix 1, which they had with them for a guide.

The observations were made either at the HC or at any other location (travelling, at patients' homes, at schools, at meetings, etc) where the observee happened to be whilst on duty during the day. The general nature and location of the activities in which the health worker was involved were noted in the 3rd column of the observation sheet.

The instructions to the observers were that they should, where possible, accompany the observee to collect data by actual observation. When this was achieved it was recorded by a tick in the 4th column ("Obs.") and when not achieved the information was sought by questioning and recorded as such by a tick in the 5th column ("Ques."). If the observees travelled between different locations, the observers used the same method of transport to stay with them (walked together, or travelled by same vehicle). Questioning, rather than observation, was used to find out the activities of observees (whether personal or professional, and, if professional, the nature of the activities) on occasions such as: absence of observee from health centre due to being on leave or attending to personal affairs and, for persons whose work might require them to be outside the health centre,

their activities before the day's observations were able to be started or after they finished.

If the observee's normal schedule was not to come first to the health centre in the morning, enquiries were made of them or their supervisors, or their records were consulted to find out their expected location when starting work on the selected day, and the field assistant tried to be at that location to make the required observations. If unable to locate the selected person at the start of a day, the observers made whatever enquiries they thought acceptable and useful as to the possible location of the intended observee, and attempted to be with him/her as soon as possible during the course of the day.

After the observers completed the schedules they were checked by senior staff, who sought clarification where necessary, checked the compatibility of verbal/numerical descriptions of activities, and filled in numerical codes where the field workers had left them blank due to uncertainty.

As previously stated, Appendix 3 shows a blank observation schedule. Five similar schedules were also used, differing only in that they had different sets of 60 random times down the left hand side. Field assistants haphazardly used any one of the six on a given day so that neither they nor the persons observed became used to any one pattern of observation times.

Over 529 health staff were each observed, as described above, for one day in the course of their work. Table 1 shows the numbers of health

Table 1: SAMPLE SIZE AND NUMBERS OF OBSERVATIONS MADE

Staff category	No. cases	No. observations
Community Health Aide	93	5424
District Midwife	72	4175
Public Health Nurse	43	2454
Enrolled Assistant Nurse	22	1264
Registered Nurse	40	2303
Nurse Practitioner	26	1504
(District) Medical Officer	18	1066
Dental Surgeon	13	768
Dental Nurse	21	1207
Dental Assistant	17	1004
Clerical Officer	16	952
Male Attendant	36	2115
Female Attendant	47	2760
Driver	12	690
Public Health Inspector	28	1666
Total	529	29352

workers observed, according to category, each for one day, and the number of 1-minute observations made. Categories of worker on whom less than 10 days' observations were made are not shown in the table and results for them are not presented.

Response rate was 100% except that with public health inspectors one person did not submit to observation and there were 2 whom the fieldworkers were unable to locate at work (public health inspectors travel to some extent in the course of their duties).

In the next section, results for district medical officers, medical officers and dental surgeons are adjusted to reflect some variations in the number of hours in their working week: according to the terms of their particular contract, some medical officers are expected to work 28 hours, some 40 hours per week; dental surgeons are expected to work either 22.5, 28 or 40 hours per week.

All observations were made between 8:00 a.m. and 4:30 p.m. Any work done outside of these hours will not be reflected in the results.

Results

Table 2 shows how persons in the sample distributed their time to various activities during the day. The activities are shown according to column headings 01, 02, 03 etc which were explained in the methods section (page 3).

Table 2 shows that the staff who spent the greatest part of their times in direct patient care (activity 01) were the nursing personnel (31-36% of time) and doctors (39% of their time). The staff with relatively high proportions of their time spent on administrative work (activity 02) were community health aides, nurses, clerical officers and public health inspectors (9-15% of their time). Time spent in activities 03 (being on leave at short notice), 04 (organised in-service training), 05 (meetings), 06 (supervision), 08 (travelling), 09 (waiting for work to begin), 10 and 11 (other forced inactivity) and 13 (indirectly involved with patients) were slight except that drivers travelled during 24% of the time and were engaged in forced inactivity (activity code 11) 20% of their time. Activity 14 (inspection) only really applied to public health inspectors. Time spent in activities 77 (not arrived yet, or already gone home) and 88 (did not come to work, without notification to other staff) was quite variable between categories.

Table 2 may also be examined row by row to show how each category allocated time to different tasks. Community health aides, for example (taking the first row) spent at least 10% of their time in each of the categories 01 (direct patient care), 02 (administrative activity), 03 (travelling), 12 (personal 'down time') and 77 (not yet arrived or already gone home).

Table 2: MEAN PERCENT OF TIME SPENT IN VARIOUS TYPES OF ACTIVITY, BY STAFF CATEGORY

Staff category	Type of activity*															
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	77	88
Community Health Aide	24	12	3	1	1	-	8	10	1	1	3	16	2	-	12	7
District Midwife	31	10	3	2	1	1	5	4	-	-	1	13	2	-	17	10
Public Health Nurse	32	14	2	5	4	2	5	11	-	-	1	10	2	1	7	2
Enrolled Assistant Nurse	31	9	5	2	-	-	13	5	-	-	2	18	2	-	9	5
Registered Nurse	35	15	-	-	5	-	8	2	-	-	2	14	2	-	11	5
Nurse Practitioner	36	6	4	14	1	-	1	4	-	-	2	13	2	-	13	4
(District) Medical Officer	39	5	6	2	-	-	1	2	1	-	3	4	2	-	29	6
Dental Surgeon	23	2	-	-	-	-	2	3	1	-	-	2	-	-	53	17
Dental Nurse	25	6	-	-	2	1	10	1	1	6	4	16	2	-	25	3
Dental Assistant	10	6	6	1	4	-	22	2	-	3	3	15	7	-	14	6
Clerical Officer	28	15	-	3	-	-	25	-	1	-	1	14	2	-	10	1
Male Attendant	4	1	-	-	-	-	44	6	-	1	3	30	-	-	7	3
Female Attendant	4	2	-	1	-	-	54	3	-	-	1	24	1	-	9	2
Driver	-	1	17	-	-	-	1	24	1	3	20	20	8	-	5	-
Public Health Inspector	3	13	3	2	1	2	3	16	-	-	3	14	-	12	18	10

*See p.5 for Key

Table 3 presents the results of Table 2 in a summarised form, grouping the 16 activity categories into the broader categories of productive activity, unproductive activity, and 'other necessary' activity. Productive activity comprises activity categories 'directly involving patients', 'administration', 'supervision', 'preparation and tidying', 'indirectly involving patients' and 'public health' (i.e. activity codes 01, 02, 06, 07, 13 and 14); for the drivers, 'travelling' (activity 08) was also counted as productive activity. The 'other necessary' activity was a combination of 'training', 'meetings' and 'travelling' (activities 04, 05 and 08). The rest - 'on leave', 'waiting for work to begin', 'forced inactivity', 'down time' and

Table 3: MEAN PERCENT OF TIME SPENT IN PRODUCTIVE AND UNPRODUCTIVE ACTIVITY, BY STAFF CATEGORY

Staff category	Type of activity		
	Productive	Other necessary	Unproductive
Community Health Aide	46	12	43
District Midwife	49	7	44
Public Health Nurse	56	20	22
Enrolled Assistant Nurse	55	7	39
Registered Nurse	60	7	32
Nurse Practitioner	45	19	36
(District) Medical Officer	47	4	49
Dental Surgeon	27	3	69
Dental Nurse	44	3	55
Dental Assistant	45	7	47
Clerical Officer	70	3	27
Male Attendant	49	6	44
Female Attendant	61	4	36
Driver	34	-	66
Public Health Inspector	33	19	48

(absent activities 03, 09, 10, 11, 12, 77 and 88) - were counted as 'unproductive' activities.

In Table 4, pilot and non-pilot and non-pilot health districts are compared with respect to percentage of time spent by staff in productive activity. Comparisons are made whenever the sample size was at least 10 persons, hence not all categories of staff are seen in the table. There were only minor variations between pilot and non-pilot areas.

Table 4: MEAN PERCENTAGE OF TIME SPENT IN PRODUCTIVE ACTIVITIES, BY STAFF CATEGORY - COMPARISON OF STAFF IN PILOT AND NON-PILOT DISTRICTS

Staff category	Pilot health centres		Non-pilot health centres	
	No. in sample	Percent of time	No. in sample	Percent of time
Community Health Aide	35	46	58	46
District Midwife	26	43	46	51
Public Health Nurse	16	57	27	54
Enrolled Assistant Nurse	10	55	12	55
Registered Nurse	17	67	23	56
Nurse Practitioner	10	49	16	42
Male Attendant	17	50	19	49
Female Attendant	19	60	28	60
Public Health Inspector	13	25	15	41

Table 5 makes comparisons between types I, II and III HC's in terms of mean percentage of time spent by staff in productive activities. Again, comparisons are only made between groups where the sample size in each group was at least 10, so not all categories of staff are shown. As before, differences in time spent productively are minor.

Table 5: MEAN PERCENTAGE OF TIME SPENT IN PRODUCTIVE ACTIVITIES - COMPARISON OF TYPES I, II AND III HEALTH CENTRES

Staff category	Type I		Type II		Type III	
	No. in sample	Percent of time	No. in sample	Percent of time	No. in sample	Percent of time
Community Health Aide	28	41	28	47	37	49
District Midwife	16	43	24	51	32	48
Public Health Nurse	-	-	14	63	29	51
Registered Nurse	-	-	12	60	27	61
Male Attendant	-	-	14	54	22	46
Female Attendant	-	-	17	70	27	55
Public Health Inspector	-	-	11	32	16	33

Table 6 makes comparisons between the 4 administrative health areas in terms of percentage of time spent by health workers in productive activity. As in Tables 3 to 5, in which comparisons were made between other subgroups of health centres, the only staff categories included were those with a sample size of at least 10 persons. The differences between the 4 health areas were small and inconsistent.

Table 6: MEAN PERCENT OF TIME SPENT IN PRODUCTIVE ACTIVITIES - COMPARISON OF ADMINISTRATIVE HEALTH AREAS OF JAMAICA

Staff category	Health area							
	South East		South		West		North East	
	No. in sample	% of time						
Community Health Aide	20	37	17	50	30	45	26	52
District Midwife	17	53	12	55	22	45	21	44
Public Health Nurse	-	-	10	56	11	57	13	51
Registered Nurse	10	53	-	-	15	62	12	68
Female Attendant	-	-	-	-	17	63	17	61

Comparisons between HCs in urban and rural locations are made in Table 7 below. The table only shows categories of staff for whom there were at least 10 in the sample. Differences between staff in urban and rural locations were small and inconsistent.

Table 7: MEAN PERCENTAGE OF TIME SPENT IN PRODUCTIVE ACTIVITIES - COMPARISON OF HEALTH CENTRES IN URBAN AND RURAL LOCATIONS

Staff category	Urban location		Rural location	
	No. in sample	Percent of time	No. in sample	Percent of time
Community Health Aide	19	43	74	47
District Midwife	18	51	54	47
Public Health Nurse	12	46	31	58
Registered Nurse	10	67	30	58

Discussion

When interpreting the results, it must be borne in mind that there is likely to be some bias due to the nature of the methods used, i.e. the use of observations. When one knows one is being observed, one is likely to alter one's behaviour to make it seem more acceptable. This will happen even if the observer is non-threatening. One person who had been observed even commented, some time after the event, on how hard the staff at the health centre had worked that day! Since it is possible to know the nature of the bias (people would have worked a little more busily than usual) the results should be taken in this light and the bias does not prevent a meaningful interpretation of results. Ideally, in making observations of this nature, the observer would have been present on several days before making 'real' observations, so that those being observed relaxed more and began to behave in their normal fashion.

At the time of doing the study, there was no generally agreed acceptable level for unproductive time for staff. In discussions following the presentation of preliminary results the figure of 25% has been suggested as a reasonable time. That figure would allow a member of staff a 1 hour lunch break and several minor breaks from work during the day. If the codings 12 (personal down time), 77 (absent from health centre for personal reasons) and 88 (absent for the day) are summed, it will be seen that the figure of 25% is greatly exceeded for certain personnel categories (especially dental surgeons and dental nurses); on the other hand, many of the nursing categories, and clerical officers, were working according to the suggested norm or close to it. Drivers were the category with most forced inactivity (codes 9, 10 and 11) and dental nurses were affected to a certain extent (partly by non-functioning equipment).

Dental surgeons and doctors showed a work pattern dissimilar from the other categories. They were away from the health facility (codes 77 and 88) for a greater proportion of time than were other categories (70% and 35% respectively, after allowing for the times in which they were allowed to do private practice), yet when they were present they worked practically non-stop; on average they took only 2% and 4% of personal down time (code 12) and spent very little time on any activities other than direct patient care (code 1).

The population's demand for the skilled services of the doctors and dentists outstrips the supply of these services, and in such circumstances the Ministry of Health may not be in a strong position to implement measures aimed at getting them to put in more time in Ministry service. Salaries paid by the Ministry of Health are quite low compared with what might be earned in private practice, so clearly these persons are not highly motivated to put in normal hours of work. Efforts to provide job satisfaction for doctors and dentists in other than financial terms may meet with some success.

In contrast, the male and female attendants, who are the least skilled of the staff, were among the persons with high proportions of time present at the health centre, but they used a relatively high proportion of their time as down time or for personal reasons (20% and 24%, respectively, code 12). In some small health centres persons in this category are employed part-time. Part-time people were not studied in the present study, but it seems likely that part-time employment for attendants could be considered. An alternative would be to increase their responsibilities so that they could be more fully occupied.

The public health nurses were the category spending the highest proportion of their time productively. They were active in direct patient care (code 1), administration (code 2) and travelling (code 8); they were low in terms of time spent unproductively. It is likely that the very broad nature of their duties affords them the opportunity to be quite fully engaged in productive work. It may be useful to give all categories of workers broad job descriptions so that they may utilise a greater proportion of their time.

The observers, as can be seen from Table 2, identified very little supervisory activity (code 6); it varied between 0 and 2% of time. It should be noted in this context, however, that the exclusion of type 4 HCs from this project meant the exclusion of personnel with parish-level supervisory responsibilities. Nevertheless, it was clear that very little overt supervision was taking place. The shortage of dentists, left dental nurses and dental assistants in many of the health centres without any supervision in dental matters.

The book "Primary Health Care: The Jamaican Perspective" (Ministry of Health, 1978) envisages that the district medical officer (DMO) would be the leader of the health team. In this study only 5 DMOs were observed, and although it is difficult to draw firm conclusions from this small sample it does seem as if the public health nurse is giving more leadership than they are on a day-to-day basis.

Absenteeism (code 38) varied from 0 to 10% and did not seem to be a major problem; arriving late and going home early (code 27) accounted for a much greater proportion of unproductive time, though it varied a lot from one category to another (Table 2).

Travel time (code 8) was low except, naturally, for drivers. Even community health aides, who are seen as community interface personnel and in concept were to be active in home visiting, travelled only for 10% of the time. It seems they are engaged in the health centres for a greater proportion of time than originally proposed. Public health inspectors spent more time in travelling than in actually inspecting, indicating a need for review of their transport facilities to enable them to be more productive; a review of their time-management may be fruitful. Drivers had a high percentage of time spent in forced inactivity (lack of demand, code 11). Consideration might be given to

broadening their responsibilities so that they could be more fully occupied, or to extending the number of health centres or personnel for which the drivers provide service.

A review of the literature has not shown any very similar studies to this one for workers in primary health care; however, one study was found in which the same technique of work sampling or job sampling was used to describe activities of physiotherapists in a general hospital (Domenech et al, 1983). Though the activity codes used allowed only limited comparisons with the present study it is interesting to see that the physiotherapists spent 32% of time in direct and indirect patient care and 25% of time in personal down time.

Another approach to describing activities is the keeping of a log-book or diary of activities by health workers. A recent WHO publication (WHO, 1984) suggests that for time-management purposes the health worker may keep a diary of his/her own activities in which entries are made on a grid with hourly periods in one dimension and activities in the other dimension, divided into those such as with patients, with other staff and in meetings, doing administrative work, etc. - these activities being somewhat along the lines of the work done in the present project. The health worker would then enter, say, 40 minutes on the grid in a cell appropriate to the time of day and the nature of the activity in which he/she was engaged for 40 minutes. This approach was originally suggested for this project, but the observational approach was eventually used, trusting that it may give more accurate information even though it was more time-consuming. A recent study by the Ministry of Health, Jamaica, adopted the interview approach to learn of health workers distribution of time to giving different types of clinic service and to administrative work, and in addition to describe the location in which these activities took place (Ministry of Health, 1982).

Some ways of examining the results for management purposes have been described in this discussion. The Ministry of Health may find other ways of utilizing the results to improve time utilisation by staff in the health services.

The results have been used in the collaborative work by Price Waterhouse in which information on time utilisation was required in their further studies of productivity. Price Waterhouse have reported separately on that aspect of the work to Center for Human Services.

III WAITING TIMES AND SERVICING TIMES FOR PATIENTS IN GENERAL MEDICAL CLINICS

Introduction

The data collection described in this section was done by UWI according to the needs of Price Waterhouse Associates. Certain data analyses were performed for PWA and the results supplied to them. The results described here are along similar lines to those supplied to PWA, though they are presented in a somewhat different format.

Each health centre runs a series of clinics according to a monthly schedule. The types of clinics held vary according to type of health centre, local needs, and skills and interests of staff. Certain types of activity such as general medical clinics, child welfare clinics and dental clinics are however common to most health centres of the same type.

As in the previous section, it is hoped that the data presented here will be useful from a management point of view. It is the aim of the public primary health care services to provide certain basic services for most or all of the population. There are problems in the services due to scarcity of resources of all kinds, and it is important to utilise available resources to the best advantage.

Another problem in primary health care is in motivating people to attend clinics and take advantage of them, especially the preventive services such as immunisation and antenatal care. Factors contributing to low attendance at certain types of clinics are thought to be long distances to be travelled, low priority attached to health maintenance by people who perceive themselves to be healthy, lack of awareness of need for constant supervision of chronic diseases, and long waiting times at health centres (Hamnett, 1985).

As far as curative services are concerned, low attendance at health centres is hardly ever a problem - rather, the reverse. The demand for the services of the most highly skilled persons, especially doctors and dentists, far exceeds the supply. People who can afford it usually prefer to pay for private services, either because they are too proud to accept the free public services, or because the waiting time is less, or they think the quality of care is better, or for other reasons.

This section aims to describe patient-flow and waiting and servicing times for patients attending general medical clinics served by doctors and/or nurse practitioners (NPs). The results will be discussed from the point of view that efficient use needs to be made of the time of the most highly paid members of staff, whilst at the same time value must be attached to the patients' time.

Methods

96 health centres were selected, as described on page 4. The purposes of the investigation were explained to the relevant persons, as explained on pages 4-5.

At each HC, a field worker enquired about the scheduling of clinics and was given the required information. At each of the 96 HCs which held regularly scheduled general medical clinics, one such clinic was haphazardly chosen and observed for one session. Most sessions were scheduled to start in the morning, and the observer was always asked to be present from 8 a.m. and stay until the required observations had been made. Data collection was done in 1984, concurrently with the data collection described in the previous and following sections.

The observers, after completing a brief training period, made observations in the selected HCs using the form shown as Appendix 4 ('Patient flow') for recording their observations.

On arrival, at or before 8 a.m., the fieldworker (FW) attempted to select a systematic sample of about 10 patients, the sampling proportion being calculated from estimates of expected attendance at the clinic. For example, Appendix 4 shows a clinic in which the sample was chosen by taking every 3rd patient from among those present, the target of 10 patients being slightly exceeded in this case (14 were observed). In clinics where patients were given 'numbers' by an attendant to determine the order in which they were to be attended to, the 'number' formed the basis of the sample selection. In other clinics without a 'number' system, the order in which patients were seen as the registration point was taken as the basis for selection. In a few clinics (only), neither of these sampling methods was feasible and a haphazard selection of about 10 patients was made. The sample size of 10 in each clinic was thought to be one which the FWs could in practice observe (this was verified during pretesting) and which would give sufficiently accurate mean waiting and servicing times when accumulated over all the health centres.

The first column of the observation schedule shown in Appendix 4 was for the FW to identify the selected patients by number and appearance ('Pink striped shirt', etc) as an aid in following them through the various clinic activities unobtrusively. The time at which the patient arrived was noted in the 3rd column, "8:00" being written or assumed for all patients present at or before that time.

Subsequent events were described by observation of the various 'work stations' or processing points at which the patients received attention and service. The first work station in the example shown was registration, where a records clerk (RC) worked from 8:08 to 11:00 a.m. The first patient in the sample was seen at this work station between 8:11 and 8:14 a.m., then proceeded to a work station staffed by an enrolled nurse (EN) measuring blood pressures, weighing, and testing urine, where he was attended to between 8:36 to 8:38. He was seen next by a nurse practitioner (NP) at 8:57 a.m., and so on. Patients were observed until they left the HC.

Fieldworkers used ordinary wristwatches or clocks to time the events. They attempted not to interfere in any way with normal procedures.

In the sample of 96 HCs previously described on page 4, 44 regularly held general medical clinics served by 1 or more doctors and/or 1 or more nurse practitioners (NPs - persons with nursing training and experience who have been given extended training to enable them to diagnose and treat certain common conditions traditionally the province of doctors).

In each of these 44 HCs, the patient flow in the general medical clinics was recorded according to the general scheme as shown in Appendix 4, details of personnel and work stations varying from clinic to clinic.

The sampling yielded 465 patients, systematically chosen from among the 1666 patients seen by doctors or NPs on the days when observations were made in the selected HCs.

Since it was found that there was a wide variety of patterns for work stations and patient flow, as well as in the types of staff managing each work station, the work stations were categorised according to whether they dealt with 'preliminary' procedures or whether they were 'critical work stations' (CWSs) staffed by doctors or NPs, or as those dealing with 'later' events such as the dispensing of drugs. Average times spent by patients waiting to be seen and in actually receiving service at the various work stations were calculated.

Comparisons between patients seen by a doctor and those seen by a NP at the critical work station were made, based on information relating to 34 doctors working in 32 clinics, and 25 NPs working in 23 HCs (Sometimes both a doctor and NP were working in the same session of the general medical clinic which was observed).

Results

Table 8 summarises the various activities which were seen to take place in the general medical clinics. All patients took part in some 'preliminary' activities, taking up a mean of 4.9 minutes of time. Later, the patients received a mean of 9.0 minutes' attention at the CNS with the doctor or nurse practitioner, and spent 1.2 minutes in 'later' activities (excluding any time spent in getting prescriptions filled). The mean time the patients spent at the health centre was 4 hours 8 minutes.

Table 8: DESCRIPTION OF PATIENT-FLOW IN GENERAL MEDICAL CLINICS

Activity	Types of staff involved	Types of procedures	Mean time (minutes) spent by patients
Preliminary activity	Records clerk, registered nurse, enrolled ass't nurse, student nurse, community health aide	Registration, blood pressure, urine testing, interviewing, temperature, dressings, screening, weighing	4.9
Critical work station	Doctor, nurse practitioner	Interview and examination	9.0
Later activities (see across)	(as 'preliminary activities' above)	Injections, treatments appointments (excluding issue of drugs)	1.2
Total time in contact with staff	All	All	15.1
Total waiting time	None	None	232.8
Total time spent at health centre	All	All	247.9

There were some differences between doctors and NPs in the times they spent with the patients. For doctors the mean time spent with each patient was 7.2 minutes and for NPs it was 11.3 minutes. Table 9 describes and compares frequency distributions of times doctors and NPs spent with patients.

Table 9: DISTRIBUTIONS OF TIME SPENT WITH PATIENTS BY DOCTORS AND NURSE PRACTITIONERS IN GENERAL MEDICAL CLINICS

Time (minutes) spent with patient	% of patients (n=255) seen by doctors	% of patients (n=184) seen by nurse practitioners
1- 2	11	2
3- 4	22	7
5- 6	26	21
7- 8	15	11
9-10	3	18
11-12	3	10
13-14	3	6
15-16	6	8
17-18	1	4
19-20	1	2
Over	4	11

The timing of events was as follows. In about almost all clinics some, if not all, patients arrived before 8:00 a.m. Preliminary processing of patients at the first work station usually started between 8 and 9 a.m. The first patient to have completed the preliminaries waited a mean of 36 minutes to be seen by the nurse practitioner or for 83 minutes (median 53 minutes) to be seen by the doctor. The patients flowed through the critical work stations steadily without creating any need for the doctor or NP to have to wait idly between patients. 116 patients received the staff's attention in 'later' activities.

316 patients received drugs from the health centre, though timing this activity proved difficult and data have not been further analysed.

The median time for the start of the CWSs by the NPs was 9.35 a.m. The mean time the first patient in the sample had to wait between completing the preliminaries and getting attention by the NP at the CWS was 36 minutes. In 2 of the clinics the NPs helped with the preliminary procedures, and in a third she held a brief educational session with the group of patients who were waiting. The median arrival time for doctors was 10.00 a.m. The doctor in one clinic held a brief educational session with the assembled patients prior to seeing the individual patients, but otherwise was never engaged in any preliminary activities.

Discussion

The sampling of patients by combined cluster/stratified random sampling techniques was free from known bias and the sample size was sufficiently large for confidence to be placed in the results.

Although attempts were made to describe the time devoted in dispensing drugs to each patient, the method of data collection did not lend itself to this task - staff worked out of sight or in filling several prescriptions at once, so time spent on particular individuals could not be measured.

The long time spent by patients at HCs (mean 4 hours, 8 minutes) did not include time spent by the patients waiting prior to 8.00 a.m. Patients arrived early so as to secure an early place in the queue, and to avoid being among those not granted attention by the doctor or NP when the demand for services was so high that some people could not be seen. Some patients had been given appointments for the particular day, usually for 8:30 a.m., so did not need to arrive before that time to be granted attention.

It appeared to be the practice of doctors to arrive later than most of the other staff, to allow for preliminary processing of patients to take place in advance, so that a steady flow of patients to the doctor could be maintained. This arrangement makes sense when the doctor's time is more expensive than that of other staff. Nevertheless, they started work at the DWGs after the first patients had spent a mean of 83 minutes waiting for them. Clearly, if the doctors had arrived earlier, waiting time for patients would have been reduced to an appreciable extent. Patients were waiting at 8.00 a.m. and preliminaries took about 5 minutes, so the doctors could have been assured of a steady flow of patients only a few minutes after the other staff had gone through the preliminaries with them. The same considerations would apply to patients served by NPs, though they started their work on average about 25 minutes earlier than did the doctors.

In some HCs, it was explained to the observers that it was the custom of the staff to register a "quota" consisting of the first 30 or 20 patients, and in addition any patients considered to be emergencies. This custom seems to have arisen from a belief that the doctor cannot give suitable quality of care to a greater number of patients. This study did not assess quality of medical care. One would therefore have to seek other sources of information to decide whether an average of 7 minutes per patient would assure suitable quality. The most common consultations were likely to have been for chronic conditions such as hypertension, diabetes, osteo-arthritis on older people, infectious diseases such as mild respiratory conditions, gastroenteritis, sexually transmitted diseases and skin infections.

During informal discussions with colleagues on the topic of waiting times for patients in health centres, the opinion has often been expressed that the patients do not mind waiting at health centres, as the occasion affords them a welcome opportunity for social intercourse; the comment has been made by more than one person that patients are grateful to see the doctor

anyway so do not mind waiting. Similarly, a small number of health service staff, when asked how they feel about working in what seem to the writer to be noisy, crowded conditions, say they get used to it and do not mind.

In spite of what is written above, one would imagine that there would be many patients for whom the long wait was unwelcome. Some would be feeling unwell and perhaps would rather be at home resting. Some would feel well enough to spend time more usefully in pursuing gainful employment or in domestic or agricultural tasks, even though perhaps elderly or unemployed. From the point of view of the health services, wear and tear on buildings and furniture would be less if waiting times were shorter. Further study of some of these issues may be useful.

A small number of general medical sessions appear to have been scheduled for the afternoon. Nevertheless, at all HCs patients started arriving early in the morning to ensure that they were registered. At one health centre the patients all got registered then went away again, only to re-present themselves some hours later for the afternoon session, having meanwhile changed into fresh clothes (much to the consternation of the observer who had relied on clothing for identification of patients!) and presumably spent the intervening time in social or business activities.

Another factor which contributed to the long times spent at the health centres was the time spent in getting drugs after being seen by the doctor or NP. Sometimes the member of staff doing the dispensing (often a nurse) had earlier been engaged in preliminary activities, so could not assume this new task until later in the morning.

The data suggest that patient flow could be improved, and patient waiting times reduced, by earlier arrival at the clinics of the critical personnel (doctors and nurse practitioners) and perhaps also by arranging staffing so that time spent waiting for prescriptions to be filled could be shortened.

IV WAITING TIMES AND SERVICING TIMES FOR PATIENTS IN DENTAL CLINICS

Introduction

(The first 5 paragraphs of the introduction to section III, on page 16, on the subject of general medical clinics, also serve as background to the section on dental clinics served by dental surgeons.)

There has been a chronic shortage of dentists in Jamaica, especially in the rural areas. It was partly to meet some of the demand that a new group of staff, termed dental nurses, were trained within the last few years. These are persons with a much shorter formal training than dentists and provide services for school children only. Most dentists, it is believed, find private practice more lucrative than service with the Ministry of Health, and either engage totally in private practice or supplement their income from the Ministry with private practice. It was found (section I of this report) that dentists work short hours in health centres and work continuously, almost without a break, when they are at the HCs (page 9).

The aims of the analyses reported in the present section were to describe patient-flow and waiting and servicing times for patient attending clinics served by dental surgeons. The results will be discussed from the point of view that efficient use needs to be made of the time of the most highly paid categories of staff such as dental surgeons (dentists), whilst at the same time value must be attached to the patients' time.

Methods

The methods of sampling and the way in which the data was collected was as described for medical clinics, explained on page 17 and in the first 2 paragraphs of page 18, and illustrated by Appendix 4. Among the 96 HCs chosen for the sample, there were 16 in which regularly scheduled dental (dental surgeon) clinics were held: however, at one HC the dentist conducted his sessions between about 6 a.m. and 8 a.m., thus observations at this HC did not fall within the study design, so observations made at 15 HCs are reported here. Fieldworkers visited these HCs on haphazardly chosen days and made observations of patient flow, as previously described. On these days, 389 patients attended for treatment and the movements of 167 of them were recorded in some detail as they passed through the treatment processes.

Scrutiny of the collected data revealed that attention patients received from staff could be divided into that given as 'preliminary' activity, by staff other than the dentists, and that given as 'critical work station' activity, by the dentists themselves. Results are therefore presented in these terms.

The data sheets also revealed that time devoted to the patients in preliminary activity was so short that the units of measurement (minutes) might be relatively crude, e.g. a patient observed to be getting preliminary attention, say, between "9:10" and "9:11" a.m., might have been getting anywhere from half a minute to one and a half minutes' attention. A second way of analysing the data was therefore used to supplement the first, for both preliminary activities and critical work station activities, using the information recorded at the foot of the observation sheet (Appendix 4) in the boxes labelled "From", "Till" and "No.", in which a record was made of the starting and ending times of activities at the work stations and the numbers of patients processed. In the example shown as Appendix 4 for example, it is shown that between 9:08 and 11:00 a.m. 45 patients were registered. The mean time to register a patient at that clinic may thus be deduced. The results reports the findings using both methods of calculation.

Results

Table 10 summarises the activities which were seen to take place in the clinics served by dental surgeons.

Table 10: DESCRIPTION OF PATIENT-FLOW IN DENTAL CLINICS

Activity	Types of staff involved	Types of procedures	Mean time (minutes) spent by patients
Preliminary activity	Dental Assistant (in 1 or 2 clinics only) Clerical Officer, Dental Nurse, Attendant)	Numbering, registration (in 1 clinic, "Examination")	Method 1: 1.3 Method 2: 1.3
Critical work station	Dental Surgeon	Anaesthetics, extractions. (in 1 clinic only: fillings)	Method 1: 3.7 Method 2: 4.3
Total contact time with staff	All	All	Method 1: 5.0 Method 2: 4.7
Total waiting time for patients	None	None	143
Total time patient spent at health centre			148

In all clinics except 5 (one of which was an afternoon clinic), many patients were waiting at 8:00 a.m. Others arrived shortly after that time. The first step in getting treatment was registration, an activity demanding a mean of 1.3 minutes per patient. When the dentists started work, their routine was usually to give a group of patients each an injection to produce local anaesthesia, then go back to the first patient and perform extractions on each successive member of the group, then repeat the process with a new group of patients. The great majority of patients had to wait an interval prior to the dentists' starting work, then wait as their predecessors in the group received treatment. Total waiting time before or between different registration or treatment processes was 143 minutes, and time spent receiving attention by staff was 5 minutes.

The median arrival time of the dentists was 9:48 a.m. A mean of 26 patients per session were treated, with 3 of the 15 clinics having an attendance of fewer than 15 patients.

Discussion

There was no known source of bias in the sampling, and two methods of analysis for certain of the mean times results produced very similar results.

In all the clinics observed, an adequate number of patients had been registered prior to the dentist's arrival to keep the dentist fully occupied, so his/her time was efficiently utilised. The routine of giving a batch of patients an anaesthetic, then going back to the first for performing extraction (usually) or filling (at only on HC in the sample) also made good use of the dentist's available time.

The patients usually arrived before 8:00 a.m. or not long thereafter, so one may suppose that there was the feeling among the patients that those who came later might find the clinic unable to serve them that day; no data on this was, however, collected in this study.

A major part of the patients' waiting time was spent prior to the arrival of the dentist. It is clear therefore that waiting time could be reduced by earlier arrival of the dentists, who would be likely still to find a group of patients registered and waiting for them and would thus still be able to use their time efficiently.

As was seen in the results, a minority of clinics were attended by fewer than 15 patients. The number 15 is a somewhat arbitrary one, but seemed to the writer to suggest a clinic that had such a low attendance as to hardly make it worthwhile in terms of efficient utilisation of dentist's time.

One may only speculate whether the dentists may be able to arrive earlier and what their reaction might be if asked to do so. Some of them would have needed to travel quite a distance from their homes. The timing of their private clinics was not known by the investigators. As noted earlier, dentists are employed under different contracts stating that they should work 22 1/2, 28 or 40 hours per week, recognising that they usually have a private practice to attend to.

It may be noted that time spent waiting at dental clinics was not as great as that at medical clinics.

A similar analysis of patient flow and waiting times at clinics served by dental nurses was attempted, but it proved not possible to divide activities into 'preliminary' and 'critical' work stations. At most clinics observed the dental nurses performed both of these types of activity themselves. The work performed by the dental nurses differed from that done by the dental surgeons in that in the majority of clinics observed the dental nurses performed fillings as well as extractions.

1) INDICES FOR MAINTENANCE OF EQUIPMENT,
FACILITIES AND UTILITIES, DRUGS AND SUPPLIES,
EQUIPMENT AND FURNITURE

Introduction

It was recognised that certain physical factors could affect staff productivity in the clinic setting and that it might be useful to take them into consideration. In consultation with senior members of the PHC services, 4 possible factors were identified, viz:

1. Maintenance of equipment
2. Facilities and utilities
3. Drugs and supplies
4. Equipment and furniture

It was therefore originally one of the aims of the study to measure these factors and find their relationship to productivity.

Price Waterhouse Associates suggested the basic design of this part of the investigation and the scoring system used in analysis. UWI participated in the design, pretested and administered the questionnaires, and performed the analyses presented here.

In the light of early fieldwork experience, PWA felt that productivity might be increased more by certain other changes in the management of clinics and personnel than by improvement in the equipment and supplies, etc. described in this section. The analyses presented in this section are therefore given descriptively rather than in relation to productivity. The results will describe the health centres in the above mentioned respects and make comparisons between HCs according to whether in pilot or non-pilot districts, in rural or urban locations, whether type 1, 2, or 3 and according to administrative (geographical) area.

Methods

The sample of 93 health centres was the same as that described in Section II. Questionnaires (Appendices 5-8) were used and 4 indices for each HC were constructed from the information gained, as explained in the following paragraphs. The technique for analysis of differences between means was one-way analysis of variance (ANOVA).

1. Maintenance of equipment

Appendix 5 shows the questionnaire relating to maintenance of equipment. This list of items thought critical to the conducting of clinics, and thus likely to affect productivity, was developed in consultation with senior health staff. Part A sought information on the availability (presence) of each piece of equipment, its age, and whether functional. Part B, referred to time taken for maintenance support of the equipment, i.e. time taken for maintenance personnel to come and see or pick up a piece of equipment when notified that help was needed, and time taken after that for the equipment to be mended

and functional again.

Interviewers were instructed to gather this information from any member of staff who was able to provide it, usually a person who had worked at the HC a relatively long time and was in a good position to remember past events. A variety of personnel supplied the information, including attendants.

A scoring system was devised so that one single score or index for each HC represented the overall level of availability and maintenance of equipment as follows. In the 'Availability' column, the presence of a piece of equipment, indicated by a 'Yes', gained 10 points (Absence or "No" gained 0 points). In the 'Age (yr)' column, pieces of equipment less than 3 years of age scored 0 points, those 3-8 years of age scored -2 and those over 8 years old scored -4. In the 'Whether functional' column, 'Fully' scored 0 points, 'Partly' scored -2 and 'Not at all' scored -4.

For T2 and T3 HCs the scores ranged from a possible maximum of 140 (14 pieces of equipment with max 10 points each) down to a minimum of 0. In type I HCs the 4 questions on dental equipment were not applicable, so the maximum score was 100. When presence or absence of items was not recorded, the maximum possible score was reduced by 10. When equipment was said to be present but age was not known or not recorded, age was assumed to be in the middle category, i.e. 3-8 years and scored as -2. When 'Whether functional' was not known or not recorded, though the equipment was known to be present (available), -2 points were given, this being the middle of 3 possible categories. The replies to 'Since when' not functional were not counted in the scoring.

For each HC, the maintenance index was calculated by expressing the points actually scored as a percentage of possible maximum points, allowing for type of HC and for missing data as explained above.

Responses to Part B, 'Time taken for maintenance support', were not analysed.

The required information was gained from 93 of the 96 health centres in the sample.

2. Facilities and utilities

Appendix 6 shows the questionnaire used to devise an index for facilities and utilities. Except for the last 5 items, the list was taken from the standard plans for HCs recently built under the 'Second Population Project, Jamaica' (World Bank, 1976) according to the type of HC (T1, T2 or T3). The last 5 items were put on as an extension to those above after discussion with health personnel during pretesting.

The forms were filled in by project staff after discussion with senior HC staff and information was confirmed where possible by actual observation during data collection. No strict criteria were used for 'Good', 'Fair' or 'Poor' condition - rather, the perception of the HC staff was used.

A scoring system was devised so that a single score or index represented the overall availability and condition of the facilities and utilities. The system was as follows. Certain items (offices, general stores, food stores, reception area, records office, examination room, rooms for dental work, pharmacy), according to their condition or absence, scored 10 (good), 8 (fair), 3 (poor) or 0 (absent) points respectively. For other items (interview room, office for PHNs, laboratory area and conference room) the corresponding scores were 7, 5, 2 or 0, whilst yet other items (lunch room, janitor stores, health education area, toilets) were scored 3, 2, 1 or 0. Electricity supply was scored 12, 10, 5 or 0; water supply was coded 10, 8, 4 or 0; security arrangements (for protection of equipment, fixtures, furniture, etc.) were scored 8, 5, 3 or 0; condition of roof was scored 6, 4, 2 or 0; condition of floor was coded 5, 3, 1 or 0 and telephone service in the preceding 12 months was scored 3, 2, 1 or 0.

When information for any item was completely missing, the item was not scored and the maximum possible score was adjusted appropriately. When an item was said to be available but condition was not stated, the condition was assumed to be 'Fair' and scored accordingly.

An index for each HC was obtained by expressing the score actually obtained as a percentage of the maximum possible score.

The required information was gained from 91 of the 96 HCs in the sample.

2. Drugs and supplies

Appendix 7A is the 'Random sample of drugs and supplies inventory' which was used to obtain an index of drugs and supplies for T1 HCs. Appendix 7B is the corresponding form for T2 and T3 HCs.

At the time when this form was being designed (late 1983), the Ministry of Health was in the process of developing what was called a VEN (Vital, Essential, Necessary) list of drugs and supplies for PHC. Two draft lists were made available to the project, one for T1 HCs and the other for T2 and T3 HCs. From these lists, a 25% random sample of items was chosen and included as shown by Appendix 7. As shown in this appendix, information was collected on amounts in stock, ordering and delivery.

This questionnaire was administered by any members of the project field team who were familiar with pharmaceuticals. On most occasions a special appointment was made with suitable persons at the HCs for this interview, due to its length.

Scoring was as follows. Based on replies in the column 'Approx. how long will this supply last?'. 'Have none' scored 0, 1-29 days scored 1, 1 or 1+ months but not 2 scored 2, 2 or 2+ months but not 3 scored 3, and 4 points were given for 3 months or longer. For items with no information given, no score was given and the maximum possible score was adjusted accordingly. Forms with 5 or more non-response items were not further analysed. Scores were expressed as a percentage of maximum possible scores.

For only 51 out of a possible 96 HCs was the form sufficiently complete for inclusion in further analyses.

4. Equipment and furniture

The questionnaire used to construct the index for equipment and furniture is shown as Appendix 8. The 25 items listed were drawn up after consultation with health staff. For each item listed, a senior person at the HC was asked whether it was needed, whether the HC had any and whether what they had was adequate.

For scoring, the items from the top of the list down to 'Scissors' were given 5 points if needed and in adequate supply, 3 points if needed and available but in inadequate quantities and 0 points if needed but not available. The rest of the listed items, from 'Secure drug storage area' to the end, except for 'Foley catheter' and 'Dressing stool' were given a 3, 2, 0 coding for availability, and 2, 1, 0 points were given for availability of Foley catheter and dressing stool in a similar way. When information about items said to be needed and available was incomplete regarding adequacy of stocks, the middle score of the 3 was given. Items said to be not needed were ignored in the points system, as were items with no information recorded at all. The final score was calculated by taking points scored as a percentage of maximum possible points.

Out of a possible 96 forms, 90 were completed and included in the analyses.

Results

Table 11 shows means and standard deviations of the indices devised for maintenance of equipment, facilities and utilities, drugs and supplies, and equipment and furniture.

Table 11: INDICES FOR MAINTENANCE OF EQUIPMENT, FACILITIES AND UTILITIES, DRUGS AND SUPPLIES, EQUIPMENT AND FURNITURE

Index	No.	Mean	Standard deviation
Maintenance of equipment	93	42.6	18.0
Facilities and utilities	91	54.3	20.2
Drugs and supplies	51	29.7	16.3
Equipment and furniture	90	59.1	19.3

When indices for pilot and non-pilot areas were compared, there were no significant differences between the means for any of the 4 indices. Neither were there any significant differences between the means of HCs in rural and urban locations.

When types 1, 2 and 3 HCs were compared, there were significant differences ($p < 0.001$) between the means for all four indices, in all cases T3s having higher means than T1s, with means of T2s being intermediate (Table 12).

Table 12: MEANS OF 4 INDICES, BY TYPE OF HEALTH CENTRE

Index	Type of health centre		
	Type 1	Type 2	Type 3
Maintenance of equipment	28.2	43.6	54.4
Facilities and utilities	43.0	54.7	63.5
Drugs and supplies	20.9	31.8	39.5
Equipment and furniture	48.2	59.0	68.1

When a similar comparison was made between health areas there were significant differences ($p < 0.05$) between means for 'maintenance of equipment' and 'equipment and furniture', though there were no significant differences between means for 'facilities and utilities' or 'drugs and supplies' (Table 13). The South Eastern area (the parishes of Kingston, St Andrew and St Thomas) had the highest mean indices for 'maintenance of equipment' and 'equipment and furniture', with the indices for the North Eastern area being the lowest and those for Western and Southern areas intermediate.

Table 13: MEANS OF 4 INDICES, BY HEALTH AREA

Index	Health area			
	South East	North East	West	South
Maintenance of equipment	48.1	32.3	45.8	40.1
Facilities and utilities	54.4	48.8	70.0	48.8
Drugs and supplies	20.8	26.3	30.6	31.2
Equipment and furniture	72.2	52.9	58.3	52.9

Discussion

The questionnaire for drugs and supplies proved to be too long and complicated for the field workers and health staff to handle, hence the low response rate (51/96). This was in spite of good efforts by health staff to help the project. The need for interviewers to have certain technical knowledge of pharmaceuticals also caused some constraints in planning the fieldwork. Results for this questionnaire should be interpreted very broadly due to possible bias. The rest of the forms proved to be satisfactory in practice.

The mean national index for 'maintenance of equipment', 42.6%, was somewhat low, being just a little higher than what would be achieved, for example, by a HC with half of its equipment present, and all of it being 3-8 years old and being fully functional.

The mean score for 'facilities and utilities' was a little higher at 54.3%; such a score would have been achieved, for example, by a HC with almost all listed items present and whose condition was somewhere between 'fair' and 'poor' in the staff's perception, or by a HC with about half of all the listed items present and in 'good' condition.

The data collection forms used to obtain information used in the present analyses were, where applicable, tailored to suit the types of HCs (T1, T2, T3) being studied. It is therefore valid to make comparisons between different types of health centre, as each index compares what a HC has in relation to what a HC of that type ought to have.

'Drugs and supplies' had the lowest indices (mean 29.7%); this indicates that in general the stocks of drugs and supplies were equivalent to either all present in sufficient quantity to last about one month, or that about one quarter of the listed items were present, in quantities sufficient to last at least 3 months. Looking at the mean yet another way, it would be equivalent to having half the listed items in stock in sufficient quantity to last 1-2 months.

The shortage of drugs is well known as the supplies have been affected by the devaluation of the Jamaican dollar in relation to the currencies of the countries from which drugs are imported, without compensating increases in the amount of local currency available for purchasing these items. The situation was especially poor in the T1 HCs (mean 20.9%).

The higher indices for 'maintenance of equipment' and 'equipment and furniture' found in the South Eastern health area may be attributed to the fact that the capital city of Kingston, with its higher level of communications and services, is in that health area. One should note, however, the overall lack of differences found in comparisons of rural and urban HCs found in both this section and section II (activity analyses).

Mean scores for the two indices concerning equipment in Western health area (the County of Cornwall) were just a little less than those for Kingston; the present system for delivery of primary health care services was developed in Cornwall before being adopted by the rest of the country, and Cornwall benefited from considerable attention and expenditure under the type II project (World Bank, 1976); one may assume that this is at least partly the reason for the relatively high scores for equipment in Cornwall.

The lack of differences between pilot and non-pilot areas was also observed in section II of this report. In another study where pilot and non-pilot areas were compared (Melville et al, 1984a; Melville et al, 1984b) the differences between the HCs in pilot and non-pilot areas were only marginal, with services in the pilot areas perhaps being slightly more effective. On the whole, comparisons between pilot and non-pilot areas have been unfruitful.

VI OUTCOMES

Much data was collected by UMI during fieldwork. The outcomes are as described in the following paragraphs.

1. In this report, analyses of data have been presented concerning distribution of time by staff to various activities (Section II), patient-flow in general medical and dental clinics (Sections III and IV) and 4 different indices of equipment, supplies, etc., (Section V).

2. Other data was collected by the UMI team which would permit further analyses if this were thought useful:

2.1. Data on reporting and supervisory relationships, location of supervisors, methods of travelling and staff vacancies (Staff data sheet, Appendix 2) and the data on maintenance of equipment (part B of Appendix 3) have not been analysed. When the study was originally designed it was thought that some of these variables may be related to productivity, but as the study progressed PWA's emphasis shifted to other aspects of management apparently more likely to lead to improvement in productivity, so the above data was disregarded.

2.2. Further data on clinic schedules (Appendix 9), was collected as this was necessary for selection of the sample of clinics as described in Sections II and IV. It is possible that these forms, showing monthly scheduling for preventive health services and curative medical services and dental services, could be put to further use.

2.3. In addition to analyses done on patient flow in medical and dental clinics (Section III and IV), similar data are available and similar analyses could be done for antenatal, postnatal, child welfare, family planning, diabetes/hypertension and dressings clinics.

2.4. For the types of clinics mentioned in 2.3 and 1. above, mean times at each health centre for patient waiting and servicing times were calculated and the results supplied to PWA.

3. In May, 1984, UMI and WA participated in the seminar in Mexico City organised by Center for Human Services' Primary Health Care Operations Research (PRICOP) project and presented aspects of their investigations, which were at a preliminary stage at the time.

4. A preliminary analysis of the activity data (Section II) was presented to a group of senior health staff from the health departments of the parishes of Kingston-and-St-Andrew and St Thomas, using data only for those parishes (the South Eastern health area). This took place at UNI in 1984.

5.5.7. Similar presentations were made for the parishes of St James, Hanover, Trelawny, St Elizabeth and Westmoreland (the Western health area), in Montego Bay; for the parishes of St Catherine, Clarendon and Manchester (the Southern health area) in Spanish Town; and for the parishes of Portland, St Mary and St Ann (the North Eastern area) in Port Maria. These took place in late 1984 and early 1985.

3. A presentation of results for all parishes combined was made at the Ministry of Health in Kingston in early 1985.

The presentations referred to in 4-8 above took the form of talks supported by written papers, with discussion following. All were complemented by presentations from PWA and attended by Ministry and local staff.

9. Two presentations based on data shown in sections II and III were made to academic audiences at UNI in May and June, 1985.

10. A paper (Cacnarian and Desai, 1985) was presented by PWA at a conference in Washington, DC, summarising both UNI's and PWA's work.

11. A paper (Desai and McCaw, 1986) summarising the work described in Section II, was presented at a meeting in Trinidad, in 1986.

12. At the time of writing this report preparation of certain papers for publication is planned. These are:

12.1. A paper on utilisation of time by staff, based on Section II of this report

12.2. A paper on patient flow in health centres, based on Sections III and IV of this report

12.3. A series of case studies based on activity analyses (Section II), patient flow (Sections III and IV), staff data (Appendix 2) and clinic scheduling (Appendix 9) for possible use by management students at UNI and any other interested parties (probably unpublished in the first place and distributed by Department of Social and Preventive Medicine in mimeographed form).

12.4. A paper describing personnel and drug costs of providing patient care in primary health, using some data from this study and (with their permission) additional data from the Ministry of Health.

12.5. A paper emphasizing methodological aspects of this and PWA's collaborative study.

13. Presentations are to be made at a FRICOR meeting and at the meeting of the National Council for International Health, in Washington, in June 1986, on aspects of UWI's and PWA's work.

14. PWA have made separate reports on their work. In 1985 the Ministry of Health had discussions with PWA leading to a decision to implement some of PWA's proposals on a local scale. It is anticipated that the trials will begin shortly in selected health districts.

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APPENDIX 1
ACTIVITY CODING

Price Waterhouse
PRICOR 11

1. DIRECTLY INVOLVING PATIENTS
Examples
Routine urine testing
Taking blood pressure, temperature
Giving health education talk
Examining patients
Registering and pulling cards
Making entries in patient's records
Taking blood e.g. for Hb, VDRL
Immunising
Interviewing patients, mothers
Examining babies
Distributing nutritional supplements
Screening
Cleaning, filling, extracting teeth
Teaching antenatal exercises
Attending to family planning services
Referring, using referral system
Dispensing drugs
13. ACTIVITIES INDIRECTLY INVOLVING PATIENTS
Examples
Consultation among staff concerning patients
Assisting other staff in patient care
2. ADMINISTRATION IN HEALTH CENTRE
Examples
Work related discussion with staff
Making telephone call, query if job related
Preparing orders
Reviewing documents
Surveying building
Completing reports (including tallies, preparing and compiling reports)
3. LEAVE - occurring at short notice
Examples
Vacation
Sick
Departmental
Maternity
Study
Special, compassionate
4. ORGANISED IN-SERVICE TRAINING
Examples
Seminars
Workshops
Zone conferences
Refresher courses
Continuing education
Regional all-island conferences
5. MEETINGS
Examples
Staff
Monthly
Bi-monthly
6. SUPERVISION
Being supervised by senior
Supervising a junior
7. ADVANCE PREPARATION, later TIDYING
Examples
Preparing equipment, supplies
Cleaning equipment for clinic
Preparing for work to begin
Clearing after work completed
Cleaning, tidying of health centre
7. (CONT'D)
Sterilizing equipment
Preparing equipment
Preparing dressing trays
Pulling patient's records on admission
Filing cards
8. TRAVELLING
Examples
- Between Health Dept. and health centre
- Between 2 health centres
- Between home visits
- On an errand
- Between home and health centre and vice-versa (record timetable)
9. WAITING FOR WORK TO BEGIN
Examples
Health centre not open
Health centre being cleaned (do not code this for female orderly or other person cleaning the health centre)
Patients being registered
Patients being screened
10. FORCED INACTIVITY
Examples
Rain
Lack of water, electricity
Lack of drugs, equipment
Natural disasters, strikes, violence, socio-political disturbances
Health centre being used for social occasion
11. FORCED INACTIVITY - LACK OF DEMAND
No patients
Waiting for orders
12. OTHER INACTIVITY - DOWN TIME
Examples
Chatting with colleagues
Sitting, doing nothing
Lunch break of health centre staff
Walking round aimlessly
On personal errand
Personal telephone call
14. PUBLIC HEALTH ACTIVITIES
Examples
Inspecting meat, poultry or other foods
Inspecting premises
Inspecting water quality
Inspecting environmental sanitation
Consulting, counselling public or institution regarding public health measures
Investigating communicable disease cases
77. ABSENT, not on leave
Examples
Not in the health centre
Late for work
Not yet arrived
Gone home/away for rest of day
88. ABSENT-FOR-WHOLE DAY - Unexplained

70

Appendix 2
STAFF DATA SHEET

DSPWUNI/Price Waterhouse
ERICOR Form 06

H C name _____ Parish _____ Type _____ (Circle) Pilot/Non-pilot
Name of FW _____ Date(s) _____ Interviewee(s) _____

PART A: To be completed for all staff based at this Health Centre

POST	NO. IN PLACE	NAME(S)	WHETHER WILL BE AT WORK IN NEXT 2 WEEKS. IF NOT, WHY? (Yes/No) Explain type of leave, dates	POST OF PERSON TO WHOM REPORTING IN PRACTICE	IS SUPERVISOR LOCATED AT THIS HC? (Y/N) If no, where?	METHOD OF TRAVELLING to hc		NO. OF VACANCIES IN THIS STAFF CATEGORY
						from home	on field visits	
DHO	1							
	2							
M.Pract.	1							
	2							
Sister	1							
R.Nurse	1							
	2							
EAN	1							
PHN	1							
	2							
DHW	1							
	2							
	3							
CH Aide	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
M Att	1							
	2							
F Att	1							
	2							
PH Insp.	1							
	2							
	3							
	4							
Cler. O	1							
	2							
	3							
Dent. S	1							
Dent. N	1							
	2							
	3							
	4							
Dent. A	1							
	2							
	3							
Pharma't	1							
Ph. T	1							
	2							
Driver	1							
Other (state)	1							
	2							

Cont'd PTC

39'

Appendix 2 (cont'd)

STAFF DATA SHEET (cont'd)

PART B: TO BE COMPLETED FOR ALL MEMBERS OF THE HEALTH TEAM WHO VISIT THIS HEALTH CENTRE TO PROVIDE SERVICES ON A PART TIME BASIS, OR WHO VISIT IN A SUPERVISORY CAPACITY, BUT ARE BASED AT A DIFFERENT HEALTH CENTRE OR OFFICE.

POST OF VISITING STAFF	NAME	NO. OF VISITS HERE IN LAST 6 mos.	NO OF HOURS SPENT ON A TYPICAL VISIT	POST(S) OF STAFF BEING SUPERVISED	NAME OF HEALTH CENTRE OR OFFICE TO WHICH ATTACHED
Nurse Sup					
SPHN					
PHN					
MO(H)					
SMO(H)					
DMO					
NP					
CPHI					
PHI					
Dent. S					
Dent. N					
Ph't					
Ph Tech					
Nut. Off					
Nut. A't					
H Ed'r					
Nurse Ed'r					
Other (who?)					

Comments:

APPENDIX 3
ACTIVITY ANALYSIS

Form PRICOR 10C

H C Name _____ Parish _____ Day _____ Date / / Observer _____
 Post of observee _____ Name _____ H C Type / _____ (60 obs/day)
 Time staff member arrived _____ Time staff member left _____

Time	Act. code	Explain activity	Type of session	Score	
				Obs	Use
8:09-10	7	Preparing for work to begin	Medical	✓	✓
8:12-13	7	Preparing for work to begin	Medical	✓	✓
8:13-14	7	Preparing for work to begin	Medical	✓	✓
8:45-46	7	Preparing for work to begin	Medical	✓	✓
8:58-59	1	Explaining obs procedure to patient	✓	✓	
8:59-9:00	1	Attending to patient	✓	✓	
9:04-05	1	Attending to patient	✓	✓	
9:23-24	1	Screening patients	✓	✓	
9:33-34	1	Dressing patients wound	✓	✓	
9:44-45	1	Dressing patients wound	✓	✓	
9:50-51	7	Preparing trolley for obs use	✓	✓	
9:53-54	7	Preparing trolley for obs use	✓	✓	
9:54-55	1	Examining patient	✓	✓	
10:19-20	1	Talking with patient	✓	✓	
10:20-21	1	Taking patient's B/P	✓	✓	
10:23-24	1	Talking with patient	✓	✓	
10:26-27	13	Taking patient's B/P	✓	✓	
10:27-28	13	Consultation with N/P	✓	✓	
10:30-31	1	Consultation with N/P	✓	✓	
11:06-07	1	Talking with patient	✓	✓	
11:10-11	12	Bath room	✓	✓	
11:20-21	12	Chatting with clerical officer	✓	✓	
11:33-34	1	Dispensing drugs	✓	✓	
11:42-43	1	Dispensing drugs	✓	✓	
11:52-53	1	Dispensing drugs	✓	✓	
11:56-57	1	Talking with patient	✓	✓	
12:25-26	12	Chatting with staff members	✓	✓	
12:41-42	1	Dispensing drugs	✓	✓	
12:42-43	1	Dispensing drugs	✓	✓	
12:52-53	1	Dispensing drugs	✓	✓	
12:55-56	1	Talking with patient re bandaging of H. Committee	✓	✓	
1:01-02	1	Dispensing drugs	✓	✓	
1:04-05	1	Dispensing drugs	✓	✓	
1:05-06	1	Dispensing drugs	✓	✓	
1:11-12	1	Dispensing drugs	✓	✓	
1:29-30	1	Dispensing drugs	✓	✓	
1:34-35	11	Back of demand	✓	✓	
1:35-36	1	Dispensing drugs	✓	✓	
1:44-45	1	Dispensing drugs	✓	✓	
1:50-51	1	Dispensing drugs	✓	✓	
1:52-53	11	Back of demand	✓	✓	
1:59-2:00	1	Dispensing drugs	✓	✓	
2:09-10	1	Dispensing drugs	✓	✓	
2:19-20	1	Dispensing drugs	✓	✓	
2:21-22	11	Back of demand	✓	✓	
2:22-23	11	" " " "	✓	✓	
2:26-27	11	" " " "	✓	✓	
2:27-28	11	" " " "	✓	✓	
2:29-29	11	" " " "	✓	✓	
2:33-34	1	Back of demand	✓	✓	
2:47-48	13	Dispensing drugs	✓	✓	
2:58-59	1	Consultation with N/P	✓	✓	
3:11-12	7	Dispensing drugs	✓	✓	
3:12-13	7	Cleaning after work completed	✓	✓	
3:27-28	7	Cleaning after work completed	✓	✓	
3:35-36	7	Cleaning after work completed	✓	✓	
3:42-43	7	Dispensing drugs	✓	✓	
3:51-52	2	Working in front of main of staff	✓	✓	
4:06-07	12	Break	✓	✓	
4:10-11	12	Break	✓	✓	

Time FW arrived 7.53 A.M Time FW left 4.00 P.M

WORK STATION DATA (for free patient-flow)

Parish _____
 H C Name _____
 H C Type _____
 (Circle) Pilot Non-pilot _____
 Name of FW _____
 Post and name of informant _____
 Date _____

NUMBERS ARE GIVEN OUT UP TO 10:00 AM

Work station number			1			2			3			4			5			6		
Activity/activities at each work station			REGISTRATION			B.P. CHECKS WEIGHING, # ORIGALYSES			INTERVIEWS			INTERVIEWS			PHARMACY			RECEPTION/STAMPING		
Staff posts/names (insert for each station)			RC			EN			DMO			NP			PHN			RC		
1.	2.	3.	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep		
1	Blue Screened Shirt	8:00	8:11	8:14	8:36	8:38					8:51	9:08	9:53	10:12	9:21	9:30				
4	Normal Process	8:00	8:22	8:24	8:39	8:41					9:16	9:20			9:31	9:23				
7	Blue Frontal Shirt	8:00	8:30	8:33	8:48	8:54					9:41	9:51			9:51	9:56				
10	Brown T Shirt	8:00	9:03	9:05	9:24	9:27	9:40	9:53					10:31	10:39	10:04	10:04				
13				NO	NUMBER	CHECKS	OUT													
16	Process of white shirts	8:00	8:42	8:45	9:13	9:15					10:09	10:29	11:11	11:18						
19	Yellow Shirt	8:00	8:49	8:51	9:21	9:23					10:27	10:37	11:18	11:20	10:31	10:38				
22	Green Shirt	9:04		10:12	10:42	10:46					11:33	11:52	12:21	12:29						
25	Blue Process	9:04																		
28	White Process	9:04	9:14	9:15	9:46	9:50					10:44	10:59	11:36	11:36	11:01	11:00				
31	Blue Shirt	9:04	10:12	10:13	10:46	10:53	11:38	11:50					12:22	12:30						
34	Various HMC	9:04	9:26	9:30	10:05	10:06	10:38	10:44					10:44	10:49						
37	Blue Process	8:13	9:32	9:32	10:13	10:17					11:21	11:25	12:13	12:17	11:21	11:27				
40	White T-Shirt	8:20	9:38	9:40	9:41	9:46														
Record here the times of operation of each work station and the total number of patients seen during this time			From 8:08 Till 11:00 No 119			From 8:36 Till 11:55 No 145			From 9:04 Till 12:14 No 17			From 8:51 Till 10:2 No 38			From 9:53 Till 2:00 No 50			From _____ Till _____ No _____		

APPENDIX 4
PATIENT FLOW

-sampling scheme: Every 3rd patient(s)

APPENDIX 5
MAINTENANCE OF EQUIPMENT

H C Name _____
H C Type _____
(Circle) Pilot/Non-pilot _____
Name of FI/Informant: _____
Date _____

A: AVAILABILITY AND CONDITION OF EQUIPMENT

EQUIPMENT (If more than one, refer to the one in best condition)	AVAILABILITY		AGE(yr)*			WHETHER FUNCTIONAL**		
	Yes	No	Below 3	4-8	Over 8	Fully	Partly	Not at all (since when?)
Refrigerator for drugs								
Infant scales								
Child scales for CHA								
Adult scales								
Desk sphygmomanometer								
Portable sphygmomanometer								
Autoclave - table model								
Steriliser - electric								
Steriliser - non-electric								
Examination lamp								
Dental equipment - chair								
-lighting								
-air compressor								
-air turbine unit (for high speed)								

*Evaluate after discussion with senior H C personnel
**If not known exactly, make an estimate

B: TIME TAKEN FOR MAINTENANCE SUPPORT

MAINTENANCE ACTIVITY	TIME TAKEN (months)		
	Less than 1	1 to 3	More than 3
Response time (come to see or pick up equipment)			
Return (mend equipment, after responding)			

APPENDIX 10
FACILITIES AND UTILITIES
 (their availability and condition)

Price Waterhouse/UWI(DSPM)
 Form PRICOR 02

Parish _____
 H C Name _____
 H C Type _____
 (Circle) Pilot/Non-pilot _____
 Name of FW _____
 Post and name of informant _____
 Date _____

(These are to be evaluated after discussion with senior H C staff)

FACILITY/UTILITY	WHETHER AVAILABLE		CONDITION		
	Yes	No	Good	Fair	Poor
<u>(Ask at all H Cs)</u>					
Offices _____					
Stores - general _____					
Stores - food _____					
Reception area _____					
Records office - shelves _____					
Examination room/rooms _____					
Interview room/rooms _____					
Lunch room _____					
Stores - janitor _____					
Health education area _____					
Toilets (staff) _____					
Toilets (patients) _____					
<u>(Ask at types III, II health centres only)</u>					
Rooms for dental work _____					
Office(s) for PHN(s) _____					
Laboratory area _____					
<u>(Ask at type III health centres only)</u>					
Pharmacy _____					
Conference room _____					
<u>(Ask at all H Cs) (In relation to last 12 months)</u>					
Electricity supply _____					
Water supply _____					
Security arrangements _____					
Roof _____					
Floor _____					

Telephone (Circle) Yes/No

Yes

INDIA 14
RANDOM SAMPLES OF DRUGS AND SUPPLIES INVENTORY

FW/UWI (DSPM)
Form PRICOR 3B

Parish Type I Health Centres

H C Name

Circle (Pilot/Non-pilot)

Name of FW

Post and name of informant

Date

Drug -Category and Brand Dosage	Amount on hand (Give units, size)	Approx. how long will this supply last?	Date of last delivery	Quantity of last delivery	Date this was ordered	Amount that was ordered	Island Med. Stc	
							Date this order left IMS	Amo ship
Expectorants 1. Expect. DPH								
Anti-asthmatics 2. Tabs. Ephedrine, Theophylline and Phenobarb								
Anti-helminthics 3. Elixir Piperazine Vitamins & Iron Preps. 4. Syre - Iron & Vita- min compound								
Antiseptics 5. Soln. Chlorphenol (pine oil alcohol)								
Diagnostic agents 6. Strips Uristrix 7. Copper sulphate solution								
NFP supplied items 8. Norinyl 1+50 tabs. 9. Diaphragms: sizes: 60-65 70-75 80-85 10. Avafortan tabs. 11. Gravindex 12. Oxitet 250mg tabs. 13. Premarin 1.25mgm tabs.								
Vaccines 14. DFT 15. BCG								
Bandages & Sundries 16. Bandages & gauze 4in. 17. Disposable gloves lg 18. KY Jelly 19. Sanitary pads 20. Sonacides								

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Appendix 75
RANDOM SAMPLE OF DRUGS AND SUPPLIES INVENTORY

PW/UWI (DSEPM)
Form PRICOR 3A

Types II and III Health Centres

Parish _____

H C Name _____

H C Type _____

Circle Pilot/Non-pilot _____

Name of FW _____

Post and name of informant _____

Date _____

Drug - Category and Brand Dosage	Amount on hand (Give units, size)	Approx. how long will this supply last?	Date of last delivery	Quantity of last delivery	Date this was ordered	Amount that was ordered	Island Med Store	
							Date this order left IMS	Amount shipped
Antacid 1. Tabs. Mag. Trisil/Al.								
Anti-diarrhoeals 2. Kaolin Levis Mixture								
Cardiac drugs 3. Tab. GTN 2.6mg 4. Tab. Propranolol 10mg 5. Tab. Propranolol 40mg								
Autonomic drugs 6. Tabs. Benzhexol 2mg								
Anti-asthmatics 7. Syr. Ephedrine, Theophylline, Phenobarb								
Other respiratory 8. Spirit of Ammonia								
Hormones 9. Tabs. Ergometrin male. 0.5mg								
Antidotes 10. Inj. Sodium thio-sulphate								
Antibiotics 11. Inj. Procaine Penicillin 3000,000 U.								
Anaesthetics 12. Lignocaine hyd. 2% c adrenalin (dental use)								
Antiseptics and applications 13. Liquid hydrogen peroxide. 14. Liquid iodine mites 15. Savlon								
Diagnostic agents 16. Copper sulphate solution								

Continued.....

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APPENDIX 7B (cont'd)

Drug - Category and Brand Dosage	Amount on hand (Give units, size)	Approx. how long will this supply last?	Date of last delivery	Quantity of last delivery	Date this was ordered	Amount that was ordered	Island Med. Store	
							Date this order left IMS	Amount shipped
NFPB supplied items								
17. Norinyl 1+50 tabs.								
18. Depo provera								
19. Diaphragms								
sizes: 60-----65-----70								
75-----80-----85								
20. IUCD - Copper T								
21. Mestatin tabs.								
22. Oxitet 250mg tabs								
23. Panadol tabs.								
24. 1.25mg tab. Premarin								
Vaccines								
25. DPT								
Bandages and Sundries								
26. Bandages gauze 4 in.								
27. Blades, surgical								
28. Tongue depressors (wood)								
29. Masks, disposables								
30. Needles, disposable								
31. Pap smear fixative								

APPENDIX 8
EQUIPMENT AND FURNITURE

Price Waterhouse/UWI (DSPM)
Form PRICOR 04

Parish _____
H C Name _____
(Circle) Pilot/Non-pilot _____
Name of FW _____
Post and name of informant _____
Date _____

Item	In this health centre, do you need these?	If <u>yes</u> , do you have any?	Is what you have adequate?
Needles, syringes			
Stethoscope - bi-aural			
Stethoscope - foetal			
Urine testing equipment			
Speculum			
Forceps			
Scissors			
Secure drug storage area			
Desks			
Examination couches			
Chairs			
Benches with backs			
Mucus extractor			
Dressing trolley			
Bowls - dressing			
Kidney dishes			
Gallipots			
Steriliser drums			
Thermometers			
Uterine sound and dilators			
Diagnostic sets			
Probe			
Needle holder			
Foley catheter			
Tongue depressor			
Dressing stool			

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