PERFORMANCE AUDIT REPORT
OF THE MINISTRY OF HEALTH'S MANAGEMENT
OF THE SUPPLY OF PRESCRIPTION DRUGS
TO MEET THE NEEDS OF THE POPULATION

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Table of Contents

LIST OF ABBREVIATIONS

BHC	Bustamante Hospital for Children
CRH	Cornwall Regional Hospital
HCL	Health Corporation Limited
KPH	Kingston Public Hospital
MOF	Ministry of Finance
MOH	Ministry of Health
NCH	National Chest Hospital
NERHA	North East Regional Health Authority
NHF	National Health Fund
RHA	Regional Health Authority
SERHA	South East Regional Health Authority
SRHA	Southern Regional Health Authority
STH	Spanish Town Hospital
VEN List	Vital, Essential and Necessary list of drugs
WRHA	Western Regional Health Authority

FOREWORD

Over the years concerns have been expressed about the long wait and availability of prescription drugs at public health facilities. The Government allocated $2.2 Billion to the Ministry of Health (MOH) for the supply of pharmaceutical and medical Supplies during financial year 2009/2010. Considering the Government's limited resources, efforts must be made to ensure the efficient and effective use of such funds to benefit the population. Such an arrangement is expected to promote and drive improvement in the quality of healthcare and public health in Jamaica. The Inventory management and supply of prescription drugs is thus, critical to this endeavour.

This performance audit report highlights that the Ministry of Health can improve on its management strategies in the administration of prescription drugs to gain greater efficiency and coordination between the Regional Health Authorities and hospitals in satisfying the healthcare needs of the nation.

I wish to express my sincere thanks to the Ministry of Health and the various hospitals for the co-operation and assistance given to my staff. I take this opportunity to acknowledge the efforts of the Ministry of Health in addressing the issues highlighted in the preliminary report to the Ministry. Subsequent media reports and press releases are evident of the Ministry's commitment to take the concerns and recommendations highlighted in this report seriously.

Special thanks to; my staff, Mr. Robert Reeve, National Audit Office of the United Kingdom and all the stakeholders who afforded us time from their busy schedule to share their views.

Pamela Monroe Ellis, FCCA, FCA, CISA
Auditor General

EXECUTIVE SUMMARY

Prescription drugs are dispensed to patients of public hospitals and health centres by public and DrugServ pharmacies. Prior to April 2007, prescription drugs were issued to patients at subsidised fees. The Government of Jamaica implemented a no user fee policy for children with effect from April 2007 and subsequently extended to all Jamaicans (except those attending the University Hospital of the West Indies) with effect from April 1, 2008. Under the no user fee policy, persons can access free healthcare including prescription drugs from all public health facilities. Since the abolition of user fees, the Ministry of Health has reported a 30 per cent increase in patient load at public health facilities.

The approved estimates of expenditure for the purchase of pharmaceuticals and medical supplies for the financial years 2006-07, 2007-08 2008-09 and 2009-10 were $451 million, $781 million 2.2 billion and $2.2 billion respectively. This represents increases ranging from 73 to 176 per cent. The $2.2 billion approved budget for the purchase of pharmaceuticals and medical supplies for the financial year 2009-10 represents a per capita allocation of approximately $798 as compared to $168 at 2006/2007.

The supply of prescription drugs to public hospitals and health centres is mainly through the Health Corporation Limited (HCL). HCL is a government owned company established by the Ministry of Health with responsibility for the procurement, warehousing and distribution of prescription drugs for public sector hospitals and health centres. Prescription drugs are also dispensed from ten DrugServ pharmacies owned and operated by the Health Corporation Limited. The Corporation's total sales for the last three financial years (2007/08 to 2009/10), was $3.9 billion. More than 99 per cent of this amount represents sales to public hospitals and health centres.

The four Regional Health Authorities exercise control and direction over the procurement of prescription drugs by hospitals and health centres located in their respective health regions. The Ministry of Health is directly responsible for the payment for prescription drugs supplied to hospitals and health centres by HCL.

Key Findings

1. The Ministry of Health's indebtedness to the Health Corporation Limited is causing significant cash flow problems in meeting payment obligations to suppliers. As at December 31, 2010, the Ministry of Health owed the Health Corporation Limited $1.1 billion.

2. Public pharmacies are facing difficulties in meeting the needs of patients due to the HCL's inconsistency in satisfying hospital demands because of stock-outs and low stock levels. As a result, the Regional Health Authorities purchase urgently needed prescription drugs from private suppliers at much higher prices. The lack of a Ministry of Health strategy and guidance has resulted in variable purchasing arrangements.

3. We found that three Health Regions namely; SERHA, NERHA and WRHA, opted to purchase prescription drugs valued at $796 million, from private suppliers rather than HCL. Consequently, the Ministry failed to realise possible savings on the acquisition of these drug of approximately $202 million.

4. The lengthy delays in obtaining prescription drugs are partly a result of the shortage of pharmacists in the public health system. The Ministry of Health has not properly managed the employment and retention of public pharmacists.

5. Record keeping at hospitals' pharmacies is either inadequate or non-existent. And, internal controls are ignored during the distribution of drugs from the main store to the wards and pharmacies. The public pharmacy computerised

management system is not being used for the management of prescription drugs. As a result, there is no formal system in place to track usage patterns and aid effective decision making. The lack of coordination among the Regional Health Authorities and the Ministry of Health, and the poor record keeping must be addressed to obtain an efficient and effective prescription drug service.

6. The Ministry of Health does not have a strategy, and has not issued guidance for dealing with prescription drug shortages; with the result that public pharmacies have different purchasing policies. This coupled with the late submission of requisitions to the Health Corporation Limited by hospitals are two main factors that contribute to the delays in the supply of prescription drugs to hospitals. The processes used for dispensing prescription drugs are inefficient and ineffective in meeting the needs of patients. In addition, patients demand coupled with the shortage of pharmacists in the public sector results in failure to meet patients' needs as well as long waiting times.

7. The Ministry of Health has delegated all responsibility to the Regional Health Authorities, to manage and deliver prescription drugs to the public and the Regional Health Authorities work in isolation instead of working together to better manage the supply of prescription drugs. There is no formal networking and partnership between public pharmacies which negatively impacts on the potential for a better service to patients.

8. There is little or no oversight by the Ministry of Health and the Regional Health Authorities, which resulted in a fall in the basic standards for the storage and protection of prescription drugs. Hospital pharmacies and wards are operating with malfunctioning air conditioning units and refrigerators in storage areas, which result in prescription drugs being kept in inappropriate conditions that threaten the potency and efficacy of the drugs.

9. The Ministry of Health is not properly managing drugs donated to Jamaica. Donated drugs are often in large quantities and short-dated, resulting in limited use and early expiration. This raises further concerns about storage and disposal costs and possible environmental issues in respect of expired drugs. The absence of appropriate waste management initiatives on drugs (donated or otherwise), by the Ministry of Health and the Regional Health Authorities, results in the underutilization of drugs and delays in the disposal of drugs cost. This lack of a waste management policy does not provide an incentive for hospital to ensure that drugs are utilised either through their own use or networking.[1]

Recommendations

1. The Ministry of Health should work closely with the Health Corporation Limited, the four Regional Health Authorities, and public pharmacies to manage better the procurement and supply of prescription drugs. The procurement approaches should be standardized and streamlined to ensure the timely delivery of prescription drugs to hospitals. Furthermore, the Ministry of Health should better manage procurement arrangements so that prescription drugs are more readily available at HCL.

2. The Ministry of Health should establish a proactive approach to monitoring the demand for and the supply of prescription drugs so that it has robust data to enable proper management, i.e. put in place effective monitoring arrangements and enables the early identification of emerging drug supply and patient handling problems. A central management and information system would offer the prospect of financial savings.

3. The Ministry of Health should measure the productivity and efficiency of the public pharmacies and identify good practice that will bring about new and

[1] Sharing prescription supplies with other hospitals

innovative ways of working, and performance improvement that benefit inpatients and outpatients. Networking of pharmacy services could be considered in the medium term to enhance greater efficiency in service delivery.

4. The Ministry of Health should design, implement, and maintain adequate internal control systems in public pharmacies for the safeguard of prescription drugs. It should ensure that appropriate records are maintained by all public pharmacies to inform the budgeting and procurement processes, and should demand regular reports (for example, quarterly reports) on the status and management of the prescription drug service delivery to patients.

5. The Ministry of Health should train pharmacy staff to use, immediately, the existing IT management system. The investment of public money in this system is wasteful if it continues to remain unused. The Ministry of Health should expect regular detailed and analytical reports from the pharmacy managers and the four Regional Health Authorities that will enable it to better manage its commitment to the healthcare of the population.

6. The Ministry of Health should make greater efforts to enhance the attractiveness and rewards for a career pharmacist working in the public sector. It should consult with the various stakeholders to review and inform an action plan to deal with the long term shortage of public pharmacists. An immediate first step should be to engage better with private and public pharmacists and training institutions to identify concerns and find solutions.

7. The Ministry of Health, in tandem with the Regional Health Authorities, should identify the financial resources within existing budgets to reduce the large number of vacancies in the approved cadre of pharmacists. This, in part, could be achieved by implementing a more efficient prescription drugs management

system that would minimize the costs associated with expired drugs and expensive purchases from private suppliers.

8. There is an immediate requirement that the Ministry of Health should better manage the physical conditions in which prescription drugs are being stored. The public pharmacies are not in compliance with drug manufacturers stated storage conditions. This requires urgent attention as the efficacy of the drugs and the health of patients are at risk with the continued lack of basic drug stock management in the public pharmacies. As part of this, the Ministry of Health should immediately develop a strategy to deal with drug shortages and establish rigorous inspection and monitoring of the drug storage facilities in public hospitals and health centres.

9. There is an immediate requirement for the Ministry of Health to ensure strict compliance with the regulations governing donated drugs.

10. The use of modern dispensing and preparation equipment should be considered as a priority to ensure more efficient and effective pharmacy operations that will reduce waiting time in the medium to long term. The Ministry of Health should publish details of its review and how it proposes to improve the prescription drug service to patients. This would increase public confidence in the Ministry's arrangements and introduce greater transparency.

11. Although the Regional Health Authorities exercise control and direction over the procurement of prescription drugs by hospitals and health centres, the Ministry of Health should exercise greater oversight over the operation of pharmacy services to ensure the needs of patients are met.

12. The shortage of pharmacists should be a priority concern for the Ministry of Health and the Regional health Authorities. We were informed that the

remuneration of pharmacy staff is a contributory factor for the vacancy numbers. However, the Ministry of Health has not conducted research to understand fully the problem; for example, the variability in the vacancies for pharmacists and technicians in the four regions.

13. A coordinated system of networking of pharmacy services and patients' health could be useful in effectively monitoring dispensing history. In addition, there could be improved efficiency in the dispensing of prescription drugs to patients. This collaboration will also aid in overcoming situations where short dated drugs are allowed to expire at one institution while others are experiencing a shortage of these drugs.

Conclusion

The Ministry of Health, together with its Regional Health Authorities which has the responsibility for healthcare delivery across the island, has not properly managed the supply of prescription drugs to meet the needs of patients. Public pharmacies lack basic, stock management techniques to ensure the availability of adequate supplies of prescription drugs to meet the needs of the population. In addition, despite being aware of the adverse impact of the shortage of public sector pharmacists on pharmacy service, the Ministry of Health has failed to successfully implement sustainable solutions to address the issue. The aforementioned have resulted in patients, who access healthcare at public hospitals and health centres, facing difficulties obtaining prescription drugs.

The Ministry of Health, as it seeks "to ensure the provision of quality healthcare services and to promote healthy lifestyles and environmental practices" should seriously consider the recommendations contained within this report.

Part One Introduction

1.1 We conducted a performance audit of the management of prescription drugs in the public health sector to determine whether the Ministry of Health is effectively managing the supply of prescription drugs to meet the needs of patients. Our audit focuses on the procurement, storage and dispensing of prescription drugs within public health facilities and assesses the efficiency and effectiveness with which the Ministry of Health conducts these operations.

Audit Scope and Methodology

1.2 Our audit was planned and conducted in accordance with the Government Auditing Standards, which are applicable to Performance Audit and issued by the International Organization of Supreme Audit Institutions (INTOSAI). The planning process involved gaining a thorough understanding of the various factors that influence the efficient and effective management of prescription drugs by the Ministry of Health. We conducted an issue analysis to determine whether the Ministry of Health is effectively managing the supply of prescription drugs to meet the needs of patients. The audit was therefore designed to determine whether:

- The Ministry of Health could better manage its finances to improve the supply of prescription drugs to patients;
- The management system is enabling the efficient supply of prescription drugs to patients;
- There is an appropriate system in place to ensure the efficient and effective dispensing of prescription drugs to patients;

- There is an effective structure within the public health sector that promotes a coordinated and cohesive approach to prescription drugs management between the Ministry of Health and the four health regions.

1.3 We assessed the procurement and dispensing processes and storage conditions at five major hospitals in the South East and Western Regional Health Authorities. The hospitals that we selected were the Bustamante Hospital for Children, Cornwall Regional Hospital, Kingston Public Hospital, National Chest Hospital and Spanish Town Hospital. In addition to the former hospitals, we observed the pharmacy management and dispensing processes at the Mandeville Regional Hospital.

1.4 Our assessment is based on the review of internal and external documents, interviews with officials, pharmacy staff, outpatients, observations and analysis of data.

1.5 We consulted with stakeholders to capture their views on the subject. These stakeholders included the Health Corporation Limited, the National Health Fund, Regional Health Authorities and the Pharmaceutical Society of Jamaica.

Background

Regional Health Authorities

1.6 The health system was de-centralized in 1997 with the promulgation of the Health Services Act; which established four Regional Health Authorities **(Picture 1).** The Regional Health Authorities are statutory bodies of the Ministry of Health and they are responsible for the delivery of healthcare to the population:

- North East Regional Health Authority
- South East Regional Health Authority
- Southern Regional Health Authority
- Western Regional Health Authority.

1.7 The South East Regional Health Authority serves 47 per cent of the population followed by the Southern, Western and North East Regional Health Authorities which serve 22, 17 and 14 per cent of the population respectively (**Figure 1**).

Figure 1: Parishes and population served by Regional Health Authorities

Regional Health Authority	Parishes Served by a Regional Health Authority	Population 2008	Population 2009	2008 & 2009 Percentage (%)
South East	Kingston, St Andrew, St Catherine and St Thomas	1,258,878	1,261,894	47
Southern	Clarendon, St. Elizabeth and Manchester	588,560	589,971	22
Western	Hanover, St James, Trelawny and Westmoreland	474,944	476,082	17
North East	St Ann, St Mary and Portland	369,976	370,863	14
	TOTAL :	**2,692,358**	**2,698,810**	**100**

Source: Statistical Institute of Jamaica.

Hospitals and Health Centres

The four Regional Health Authorities manage 26 hospitals and 300 health centres throughout Jamaica. Hospitals are categorized as Types A, B, C, Specialist and Community hospitals while Health Centres are classified as Types I through to V. (**Figures 2** and **3**).

Figure 2: Classification of Hospitals

Type of Hospitals	Number of Hospitals	Description
A	3	Multi-disciplinary institutions such as; Kingston Public Hospital, Cornwall Regional Hospital and the University Hospital of the West Indies.
B	6	These are situated in the large urban centres, and provide services in at least five basic specialties.
C	8	These are basic district hospitals with the Primary Healthcare system at parish level.
Specialist	6	These provide specialised health services such as the Bellevue, Victoria Jubilee, National Chest Hospitals, and Bustamante Hospital for Children.
Community	3	Community Hospitals deliver services as the Type III Health Centres; however there is a ward available for delivery of maternity clients. Patients can also be admitted for 24 hours observation.
Total	**26**	

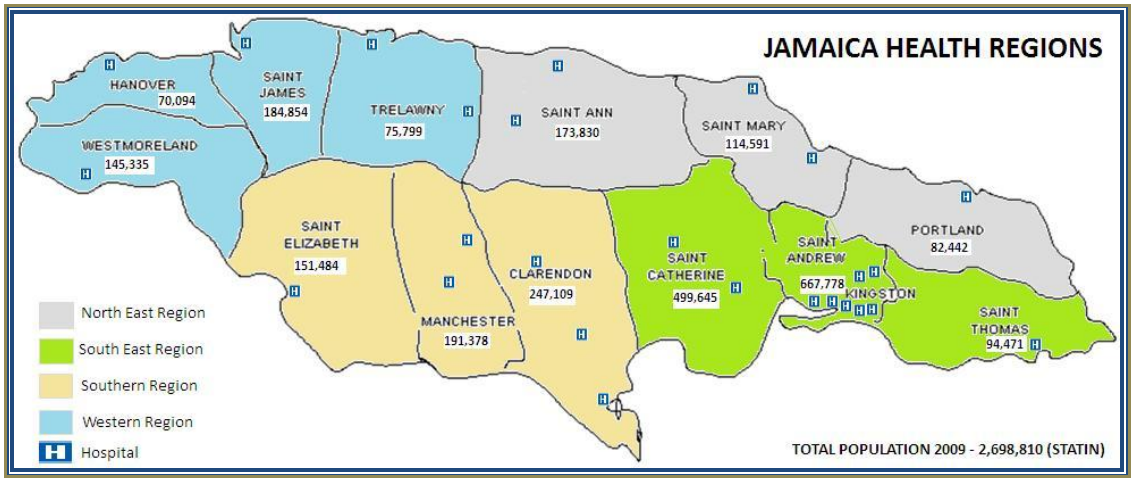
Source: Ministry of Health

Figure 3: Classification of Health Centres

Health Centre	Number	Classification meaning
I	144	Population served does not exceed 4,000 people. Services offered include basic Maternal and Healthcare, Nutrition, Family Planning, Immunization, Health Education and First Aid.
II	83	This centre serves a population of up to 12,000 people. Services offered include Family Health, Curative, Dental Environmental Health, Sexually Transmitted Infection etc.
III	61	Population served is up to 20,000 people. These provide all the services offered in Type II.
IV	8	All the services of the Type III, but has the Parish Administrative Office on the same premises.
V	4	These are Comprehensive Health Centres with all the facilities of a Type III, in addition to a specified specialty.
Total	**300**	

Source: Ministry of Health

Picture 1 Hospitals and population by Parish in the Health Regions



Source: Auditor General's Department

Health Corporation Limited is the main supplier of prescription drugs to hospitals and health centres

1.8 HCL is a government owned company established by the Ministry of Health on June 1, 1994. HCL is responsible for the procurement, warehousing and

distribution of prescription drugs. Public hospitals and health centres use HCL as their main supplier for prescription drugs and medical supplies.

1.9 In 1996, HCL established the DrugServ pharmacies programme to supply prescription drugs at reduced price to patients with prescriptions from public hospitals. Since the abolition of user fees at public hospitals, patients with public prescriptions can access free drugs at DrugServ pharmacies. HCL operates ten DrugServ pharmacies.

The Vital, Essential and Necessary (VEN) List

1.10 The Ministry of Health's General Drugs and Therapeutic Committee, in consultation with other medical representatives, developed a schedule of the drugs to be procured and distributed by the Government, which is known as the VEN list (Vital, Essential and Necessary drugs). The criteria used by the Committee to determine the drugs to be included on the VEN list are shown in **Figure 4**.

Figure 4: Definition of VEN

Classification	Meaning
Vital	Drugs (or medical Supplies) which are potentially life-saving or which are considered the drug of choice or "first line" items in their respective therapeutic categories.
Essential	Drugs (or medical Supplies) which are effective against less severe, but nevertheless significant forms of illnesses, or which provide important "back-up" for VITAL items. They include "Second line" items.
Necessary	Termed "Non-Essential." This group of drugs is used for minor, or self-limiting illnesses, and those, which have a comparatively high cost for additional therapeutic value. It includes drugs which are prescribed but which provide useful alternative therapy.

Source: Ministry of Health

Proposed Merger of the National Health Fund and Health Corporation Limited

1.11 The National Health Fund (NHF) is a statutory organization under the Ministry of Health. The NHF provides drugs to patients with specific chronic illnesses under

its regular NHF Drug Programme and the Jamaica Drug for the Elderly Programme (JADEP). NHF budget for the financial year ending 2009-10 was $2.3 billion ($2 billion for the Individual Benefits Programme and $336 million for the JADEP Programme).

1.12 The government has already taken steps to amend the NHF Act to make the Fund responsible for procuring, warehousing and distributing medical supplies for Government-owned health facilities. Under the new arrangement, the NHF will assume all of the assets and liabilities of the HCL. The Ministry of Health will continue to have responsibility for the payment of prescription drugs supplied to hospitals and health centers.

Part Two The Ministry of Health faces difficulties in funding the supply of Prescription drugs

2.1 The Ministry of Health, through the Consolidated Fund, provides annual budgetary support to the Regional Health Authorities. Each hospital submits annual estimates of expenditure, for the purchase of medical and pharmaceutical supplies to their respective Regional Health Authorities. The Regional Health Authorities compile the various budget proposals and submit an overall budget request to the Ministry of Health which is further collated and submitted to the Ministry of Finance and the Public Service.

2.2 We were informed that expenditure trend adjusted for inflation and usage pattern are the main factors considered in the compilation of the annual estimates. In addition, the budget allocation to the Regional Health Authorities for the financial years 2006-07 to 2010-11 shows that the size of the budget allocation to each region was generally in line with each region's population (**Figure 5**).

Figure 5 Grants for Purchase of Pharmaceutical and Medical Supplies

	Population	Annual Budget Allocation by percentage					
Regional Health Authority	2008 & 2009 (%)	2006-07 (%)	2007-08 (%)	2008-09 (%)	2009-10 (%)	2010-11 (%)	Average (%)
South East	**47**	43	43	42	44	44	**43**
Southern	**22**	21	19	21	20	20	**20**
Western	**17**	21	23	23	22	22	**22**
North East	**14**	15	15	14	13	13	**14**

Source: Estimates of Expenditure and Statistical Institute of Jamaica

Ministry of Health's Indebtedness to HCL Causes Serious Cash Flow Problems

2.3 Health Corporation Limited total sales for the last three financial years (2007-08 to 2009-10) amounted to $3.9 billion. More than 99 per cent of this amount represents sales to public hospitals and health centres. We found that over the period April 2006 to March 2010 the number of patients visiting public pharmacies increased by 405,331 (59 per cent). Whilst the demand for prescribed items grew by 1.75 million (88 per cent) from 1.99 million over the corresponding period. We were informed that the abolition of user fees for children under 18 years in April 2007 and for adults in April 2008 contributed to the increase (**Figure 6**)

Figure 6-Demand on Public Pharmacy Services 2006-07 to 2009-10

Particulars	2006-07	2007-08	2008-09	2009-10
Pharmacy Visits	690,574	684,342	872,583	1,095,905
Percentage Increase		-1%	28%	26%
Pharmacy Items Prescribed	1,985,970	2,121,164	2,743,362	3,736,099
Percentage Increase		7%	29%	36%

Source: Ministry of Health

2.4 This increased demand for Pharmaceuticals and Medical Supplies was matched by an increase in the budget allocation of 396 per cent over the same period. For the financial years 2007-08 and 2008-09 the Ministry of Health incurred its most significant increases in costs of drug supplies of $330 million (73 per cent) and $1.37 billion (176 per cent) respectively over the previous year. (**Figures 7**).

Figure 7 Grants for Purchase of Pharmaceuticals and Medical Supplies

Regional Health Authority	2006-07		2007-08		2008-09		2009-10		2010-11	
	$'000	(%)	$'000	(%)	$'000	(%)	$'000	(%)	$'000	(%)
South East	192,462		335,000		910,000		980,000		980,000	
Southern	93,050		150,000		444,000		456,616		456,616	
Western	95,800		180,000		500,000		500,000		500,000	
North East	69,582		116,445		300,000		300,000		300,000	
Total	**450,894**		**781,445**		**2,154,000**		**2,236,616**		**2,236,616**	
Increase				**73**		**176**		**3.7**		**0**

Source: Annual Estimates of Expenditure

2.5 The increased costs created challenges for the Ministry of Health to pay HCL. Over the period 2007-08 to 2009-10 the Ministry's indebtedness to HCL increased from 18 per cent to 58 per cent of purchases made. Approximately $469 million, (40 per cent) of the $1.1 billion owed, as at December 2010, was in-excess of 90 days. (**Figure 8**)

Figure 8-Ministry of Health Indebtedness to HCL 2007-08 to 2009-10

Particulars	Balance as at March 2008 ($)	Balance as at March 2009 ($)	Balance as at March 2010 ($)	Balance as at December 2010 ($)
Purchases From HCL ($)	929,311,078	1,837,091,673	2,311,695,742	1,854,912,177
Amount Owed to HCL ($)	171,778,484	473,682,196	603,694,754	1,082,442,396[2]
Amount owed to HCL (%)	18	26	26	58

Source: Health Corporation Limited

2.6 In order to address the cash flow problems, since April 2009 HCL negotiated new credit terms with suppliers ranging from 30 to 210 days. This arrangement provides only a temporary solution to the problem and if not managed properly could worsen the cash flow situation.

[2] HCL: $695M and DrugServ: $388M

2.7 We found that the Corporation's indebtedness to suppliers for the period March 2008 to December 2010 increased by $358 million from $190 million to $548 million. If this trend continues HCL will have to continue to rely on external financial support to ensure the continued supply of drugs to the public. **Figure 9** shows the growth in HCL indebtedness to its suppliers since March 2008 to December 2010.

Figure 9-HCL indebtedness to suppliers for drug purchases 2007-08 to 2009-10

Particulars	Balance as at March 2008 ($)	Balance as at March 2009 ($)	Balance as at March 2010 ($)	Balance as at December 2010 ($)
Drug Purchases by HCL	825,096,755	1,400,105,549	1,864,153,838	1,547,225,401
Amount Owed for Drugs Purchased by HCL	189,759,881	443,869,738	250,964,313	547,812,861
Amount owed in excess of 90-days	68,049,100	101,846,435	30,171,833	144,223,799

Source: Health Corporation Limited

Hospitals Poor Purchasing Decisions is Contributing to the Increasing Drug Cost

2.8 The objective of HCL is to supply prescription drugs to public health facilities at an average price of 40 per cent below private suppliers. The most recent results from a HCL price survey (conducted between January and March 2010) shows that HCL pricing was averaging 34 per cent below other suppliers.

2.9 We found that for the period April 2006 to March 2010, three Health Regions namely; SERHA, NERHA and WRHA opted to purchase prescription drugs from private suppliers valued at $796 million (17 per cent of the total purchases) rather than HCL. These purchases were mainly for cancer and renal drugs. However, HCL indicated that the quantity of cancer and renal drugs stocked was based on the demand; in these instances the WRHA did not requisition the drug types. Using the average cost (34 per cent below competitors) at which prescription drugs were supplied to public health facilities by HCL at March 2010,

the Ministry could have saved up to $202M on the purchases of such drugs if the orders had been placed with HCL. We were unable to undertake a similar analysis for the SRHA region as the information requested was not provided. **(Figure 10)**

Figure 10-Purchases of Regional Health Authorities April 2006 to March 2010

Regions	Purchases from HCL	Purchases from Private Suppliers	Total Expenditure	(%)
SERHA	1,923,156,339	301,723,754	2,224,880,093	14
NERHA	693,086,245	14,008,411	707,144,656	2
WRHA	1,125,037,058	480,377,320	1,650,414,388	29
TOTAL	**3,741,279,642**	**796,109,485**	**4,582,439,137**	**17**

Source: Regional Health Authorities (Data for SRHA was not provided)

Part Three Patients Face Extensive Delays in Obtaining Prescribed Drugs from Public Pharmacies

3.1 Public hospitals have experienced increased demand for prescription drugs. Bustamante Hospital for Children, National Chest and Spanish Town Hospitals reported 25, 40 and 32 per cent increases in patient load respectively at the end of 2008 when compared to the previous year. For the same period, prescription dispensing showed 36, 13 and 19 per cent increases respectively. Cornwall Regional and Kingston Public Hospitals reported 13 and 31 per cent increases respectively in patient load. Also, prescription dispensing showed increases of 23 and 38 respectively for the financial year 2008/2009 (**Appendix 2**). The removal of the user fees was one of the reasons given for the increased demand for prescription drugs.

3.2 There was no evidence that the Ministry of Health developed a strategy to ensure that public pharmacies are better able to attend to the many outpatients who are in need of an efficient and effective daily service to meet their health needs. Further, the Ministry of Health did not work closely with the four Regional Health Authorities or HCL to determine and manage the impact of increased public demand for prescription drugs.

Shortages of Pharmacists in the Public Sector Impact on Patient Service Delivery

3.3 We surveyed 268 patients at Kingston Public, Spanish Town, Mandeville and Cornwall Regional hospitals. We found that 61 per cent of the patients interviewed arrived at the Hospital by 7:00am in-order to get their prescriptions filled. Seventy-eight per cent of the patients interviewed indicated that they normally have to wait more than three hours before getting their prescriptions filled. Seventy-seven per cent of the patients at Cornwall Regional Hospital indicated that they normally wait for more than five hours. However, at the other three hospitals, only 22 per cent of the patients indicated that they waited in excess of five hours. Patients at the Cornwall Regional Hospital complained that the waiting time could be improved if the number of pharmacists were increased.

3.4 We found that the Ministry of Health has not properly managed the employment and retention of pharmacists in the public hospitals. We reviewed the staffing allocation for the four Regional Health Authorities. At August 2010, 84 (63 per cent) of the 134 established pharmacist positions were vacant (**Figure 11** and **Appendix 3**). The staff establishment has remained unchanged since 1976 despite increases of 54 per cent in patient load and demand for prescription items of 88 per cent over the period.

3.5 We found that both Port Maria and the Annotto Bay hospitals in the North East Region were without the services of a registered pharmacist.

Figure 11 Pharmacists in the Regional Health Authorities

Regional Health Authority	Approved Posts	Filled	Vacant	Shortage (%)
Southern	21	6	15	71
North East	16	5	11	69
South East	69	27	42	61
Western	28	12	16	57
TOTAL:	**134**	**50**	**84**	**63**

Source: Ministry of Health

3.6 In addition to the shortage of pharmacists, we found that of the 103 approved pharmacy technician posts; 21 are vacant (**Appendix 3**). Pharmacy technicians work under the direct supervision of a licensed pharmacist. There is a marked contrast between the vacancy rates for pharmacists (63 per cent) and pharmacy technicians (20 per cent).

3.7 The Ministry of Health has acknowledged that the shortage of pharmacists is having negative impact on service delivery. In an effort to address the problem approval was sought and obtained from the Ministry of Finance and the Public Service for pharmacists to be paid a special sessional allowance for extra hours worked. However, we found no improvement in the waiting time of patients.

Deficiencies in Prescription Processing System also Contribute to Long Waiting Times

3.8 We conducted a 3 day survey at Kingston Public, Spanish Town, Mandeville and Cornwall Regional Hospital. We found that the average processing time[3] of prescriptions at the hospitals visited ranged between 1 ½ and 3 ½ hours. However, at Cornwall Regional and Kingston Public Hospitals it took over 6 hours to process some prescriptions. Mandeville Regional and Spanish Town Hospitals were the most efficient. All prescriptions for Mandeville were processed within 2 hours after receipt. At Spanish Town Hospital 67 per cent were processed

[3] Processing Time: Time between handing in prescription scripts and receiving the medication

within two hours. Whereas or the Cornwall Regional and Kingston Public Hospitals only 13 and 7 per cent were processed within 2 hours respectively. (**Figure 12**)

Figure 12-Prescription Processing Time (average of three days)

Hospital	Number of Prescription Scripts Processed	Number of prescription items Processed	Prescriptions Processed within two hours	Prescription Processed within two hours (%)
Mandeville	427	1249	426	99.7
Spanish Town	431	1399	277	64
Cornwall Regional	322	1594	42	13
Kingston Public	728	1216	51	7
Total	1908	5458	796	41.7

3.9 The comparative efficiency observed at the Mandeville Regional Hospital could be attributed to the prescription processing system used; medications are dispensed on an individual basis. Whereas, at the other hospitals prescription processing is done in batches. In addition, repeat prescriptions are photocopied and not hand-written as evidenced in the other hospitals.

Late Submission of Requisitions by Hospitals and Insufficient Stock at HCL Contribute to Late Deliveries

3.10 Hospitals in the regions are assigned scheduled dates to submit monthly requisitions for prescription drugs to HCL. An analysis conducted at four hospitals showed that they were tardy in meeting this required deadline. We reviewed 35 purchase orders and found that 19 (54 per cent) were submitted on average 3 to 10 days after the deadline date. **(Figure 13)**

Figure 13-Purchase Orders Submitted Late

Hospitals	Period Examined	Proportion of Orders Late (Months)	Average Days submitted after HCL Deadline
Cornwall Regional	9 months during September 2009 to July 2010	6 of 9	8
Spanish Town	11 months during August 2009 to July 2010	5 of 11	6
Bustamante Children's	7 months during June 2009 to March 2010	3 of 7	10
National Chest	8 months during April 2009 to January 2010	5 of 8	3

Source: Regional Health Authorities

3.11 HCL's delivery notes for National Chest, Cornwall Regional and Spanish Town Hospitals for the period April 2009 to July 2010 showed that 60 per cent of deliveries were, on average 21 days late. These deliveries were as much as 48, 24 and 49 days late respectively. (**Figure 14**)

Figure 14 Summary of analysis of requisitions and delivery slips

Hospitals	Period Reviewed	Total Deliveries	Deliveries made After Required Date (%)	Average days Delivered after required date	Maximum days late deliveries seen
Spanish Town Hospital	August to July 2010	74	40	18	49 days late
National Chest Hospital	April 2009 to January 2010	70	97	32	48 days late
Cornwall Regional Hospital	September 2009 to July 2010	80	40	12	24 days late
		224	60	21	

3.12 These delays will inevitably dilute the efforts of other health professionals in ensuring that Jamaica's population remains healthy and could force hospitals to source prescription drugs from private suppliers at much higher prices, if urgently needed.

Inconsistent Procurement Procedures also contribute to Delays in the Supply of Prescription Drugs

3.13 We found that the Regional Health Authorities adopt different approaches in the purchase of prescription drugs from HCL. For example, the hospitals in the South East Region send their monthly drug requisitions to the Regional Health Authority, where accompanying purchase orders are raised. In contrast, the hospitals in the Western Region prepare monthly requisitions, along with the corresponding purchase orders which are sent directly to HCL.

3.14 The process of channelling monthly purchase requisitions through the Regional Health Authorities is a lengthy bureaucratic ordering process. This results in HCL's established deadlines often not being met with consequential delays in the delivery of drugs to the hospitals. We found delays between the requisitions and purchase order dates at all hospitals except the Cornwall Regional Hospital where both requisition and purchase order are prepared at the hospital. For example, at the Spanish Town Hospital, 11 monthly requisitions examined showed that an average of 19 days elapsed from the date of the hospital's requisition and the Regional Health Authority's purchase order date. For five of eleven months analyzed, purchase orders were signed after HCL's submission deadline.

Patients have Mixed Reactions on Pharmacy Services

3.15 A survey conducted at four hospitals disclosed that patients are concerned about the dispensing process. They expressed the need for improvement in the service. Some of the comments and recommendations made by patients are noted in **Figure 15.**

Figure 15: Comments from Patients Surveyed

Comments
"When I had to pay the system was better it has gotten worse since it free. No one seems to care."
"I have no problem. I know I have to wait so I just come prepared to wait."
"The system cannot be improved if we don't get more pharmacists. Even if we get all the drugs we need if we don't have more pharmacists we will still have to come here and suffer."
"Happy that it is free, I did not even have the money for the registration before.'
"The poor man has to suffer too much. The very old may die if they have to come here and wait for the drugs themselves."
"They need to have more windows and get more pharmacists."
"There should be a special window for the elderly."

Source: Patients Views Collated by Auditor General's Department

Part Four Poor Record Keeping and Inadequate Controls Impact on the Supply of Prescription Drugs to Patients

4.1 We found that the absence of a formal system to track usage patterns coupled with unreliable prescription drug stock balances resulted in hospital pharmacies inability to determine the quantity of prescription drugs required to meet patients' needs on a monthly basis. This resulted in overstocking and shortages of prescription drugs in the hospitals.

4.2 Prescription drugs are stored in designated stores at the hospitals and then distributed to the various dispensing units namely; inpatient, outpatient and ward. The inpatient unit processes drugs for patients admitted to the institutions, the outpatient unit processes prescription drugs for outpatients who presents prescription scripts issued by a medical doctor in the public health sector, while the ward unit processes drugs for general ward supplies[4]. All three sub-dispensing units requisitioned supplies from the main pharmacy stores using internally generated requisition forms.

4.3 Pharmacies' Storekeepers are required to maintain records of stock movement to readily monitor stock balances and to alert the hospital when there is need for replenishment of stock. This record also prevents overstocking and wastage of these critical items. We found no management system in place by which drugs at the hospital pharmacies visited could be properly accounted for. For example, stock records are not maintained for prescription and other drugs stored on the wards and the outpatients' pharmacies at these locations.

[4] These supplies are required to be kept on the ward for emergency and general purposes.

The System Established to Monitor and Control the Supply of Prescription Drugs are Ignored

4.4 We found that the processes used to issue prescription drugs from the hospitals' main stores lack adequate internal controls to ensure the safeguarding of drug stocks. Record keeping throughout the five hospitals visited was either non-existent, inconsistent or disorganised. An attempt was made to verify whether prescription drugs delivered by HCL corresponded with those requisitioned. However, poor record keeping prevented verification. It was also observed that no system was in place to reconcile monthly requisitions with HCL's delivery slips to identify undelivered items.

4.5 In addition, the hospitals had poor inventory management. We observed that the hospitals failed to establish reorder levels and lead-time to prevent stock-outs.

4.6 Consequently, of the five pharmacies visited, three could not readily account for stock on hand. Our physical stock count of these pharmacies' main stores revealed significant differences between the physical stock counted and the records. Of the 70 items counted at Bustamante Hospital for Children, 33 or 47 per cent did not correspond with the stock records. At the Kingston Public Hospital, we tested 115 items which represents 25 per cent of the total population. Our count showed that 94 items or 82 per cent did not correspond with the related stock records. At the National Chest Hospital, 22 or 40 per cent of the 55 items counted did not agree with the stock records **(Figure 16).** In contrast, the inventory count conducted at the Cornwall Regional and Spanish Town Hospitals showed complete accuracy between our physical counts and inventory records.

Figure 16 Summary of stock counts at three hospitals

Hospitals	Number of stock Items Counted	Number of Items not corresponding to record	(%)
Bustamante Hospital for Children	70	33	47
Kingston Public Hospital	115	94	82
National Chest Hospital	55	22	40

4.7 At the National Chest Hospital and Spanish Town Hospital, we observed that supplies were being issued to the sub-dispensing units without being approved by appropriate staff members and without the receiving and issuing officers signing the relevant records to ensure accountability.

4.8 We found that prescribed drugs that were not administered due to early discharge or death of patients were not being returned to the pharmacy stores. This contributed to excess drugs being held on the wards, and by extension, expiration. For example, during the audit at the Kingston Public Hospital, a quantity of items including expired drugs was removed from five wards. **(Appendix 4)**

4.9 Routine audits of ward stocks are not being conducted at hospitals; thereby, excess drugs are not identified and returned to the pharmacy stores in a timely manner.

The Ministry of Health has not issued guidance for the operation of public pharmacies

4.10 The VEN list handbook (2008) provides useful guidelines for pharmacists in the public sector in discharging their responsibilities. However, we found that there were no established standard internal policies and operational procedures' manual within the public pharmacies. Draft copies of internal operational manuals were presented at the Cornwall Regional and the Spanish Town Hospitals. The absence of established policies and operational procedures ' manuals prevented the Ministry of Health from ensuring that prescription drugs were being dispense in accordance with requisite health standards and that

patient care was being efficiently and effectively managed. We met with representatives from the Ministry of Health who acknowledged the need to have standard operational procedures for all pharmacies in the public sector.

The pharmacy IT system is not being used to support the management of prescription drugs

4.11 We found that the Automated Pharmacy IT system was not being fully utilized to achieve maximum efficiency and effectiveness in the overall management of the supply prescription drugs in the public health system.

4.12 The system is designed to capture both financial and non-financial information in the inventory management process. However, we found that the use of the IT system is limited to printing of labels for prescriptions drugs during the dispensing process. Regional Health Authorities have not ensured that all pharmacy staff were trained to maximise the IT Pharmacy System capabilities. The pharmacies were also not provided with the requisite technical support for the IT system to reduce system downtime. As a result, the IT system reporting mechanism was not being used to facilitate the recording of usage pattern, costing, inventory balance nor is it used to generate management reports that could aid in decision making that provides a better service to patients and saves public money. We sought to determine the cost and objective of implementing such a system. However, the requested information was not provided.

Lack of networking and partnership impacts on the effective (and essential) monitoring of patient care

4.13 The Ministry of Health and the Regional Health Authorities are not communicating to ensure that there is more opportunity to network and better manage the supply of prescription drugs. This collaboration will aid in

overcoming situations where short dated drugs are allowed to expire at one institution while others are experiencing a shortage.

4.14 A coordinated system of networking of pharmacy services and patients' health could be useful in effectively monitoring dispensing history. In addition, there could be improved efficiency in the dispensing of prescription drugs to patients and a reduction in the quantity of expired prescription drugs.

Part Five

Prescription Drugs are not Stored in Consistently Appropriate Conditions to Maintain their Usefulness

5.1 We also observed that large quantities of obsolete prescription drugs were being stored for prolonged periods at all public hospitals visited. The hospitals' management indicated that some of the stock of obsolete drugs includes purchased inventory stocks as well as gifts from various donors. However, all five hospitals were not able to distinguish between purchased and donated obsolete stocks. Additionally, they were unable to quantify and allocate a cost to the items due to poor record keeping and store management.

5.2 We found that the storage temperature on the wards of all the hospitals visited was inappropriate. Prescription drugs were being stored in cupboards, medicine and emergency trolleys and on shelves located in nurses' stations that were without air-conditioning facilities.

5.3 In the six hospitals visited, prescription drugs were being stored in refrigerators that are not fitted with thermometers to monitor storage temperature **(Picture 2).** At the Bustamante Hospital for Children we saw prescription drugs requiring storage temperature between 2 and 8 degrees Celsius being stored at room temperature (20 to 25 degrees Celsius) for approximately two weeks due to malfunctioning refrigerator.

Picture 2 Example of thermometers installed in some refrigerators on the wards only at the Cornwall Regional Hospital

Drugs are Stored above the Required Temperature

5.4 The air-conditioning units in the pharmacy departments at Cornwall Regional, National Chest and Spanish Town Hospitals were plagued with persistent problems. For example, **Appendix 5** shows that the air-conditioning unit at the Spanish Town Hospital pharmacy has been malfunctioning since 2006. At all three hospitals, there were frequent leaks, which caused flooding in the pharmacy departments (**Picture 3).**

5.5 We were informed that, as a result of these problems, the air-conditioning units at the National Chest and Spanish Town Hospitals were being turned off overnights and on weekends leaving prescription drugs exposed to inappropriate storage temperatures. In addition, at the National Chest Hospital, the storeroom was found to be hot, dusty and chaotic. For the period of our audit, the temperature readings at the Spanish Town Pharmacy was a constant 31 degrees Celsius as against the requisite 25 degrees Celsius or below. The hospitals acknowledged that prescription drugs are not being stored under optimal storage conditions to preserve their potency and efficacy.

Picture 3 Buckets used to catch water leaking from malfunctioning air conditioning unit at the Cornwall Regional Hospital

5.6 The absence of any Ministry of Health oversight and lack of proper management has led to nursing staff personal belongings being stored with patients' prescription drugs on hospital wards **(Picture 4).**

Picture 4 Refrigerators used for storing staff personal belongings as well as in-patient prescription drugs at the Spanish Town and Cornwall Regional Hospitals.

5.7 In addition, prescription drugs are being stored in a disorganised manner at the Bustamante Hospital for Children, Cornwall Regional and National Chest Hospitals. Expired drugs are not separated from unexpired drugs.

Donor Agency Drug Gifts are often Short-Dated Resulting in Limited use, Early Expiration and High Disposal Cost

5.8 The Ministry of Health receives prescription drugs in the form of gifts from both local and international donor agencies. Guidelines for the receipt of donations were established by the Standards and Regulations Division in the Ministry of Health. The guidelines *state that "The specific products and quantities to be donated must be based on the expressed needs for domestic use at the local level" and "The donations should bear an expiry date of at least 12 months after the landed date".* However, it was acknowledged by pharmacists and officials at the Ministry of Health that donated items were not necessarily in line with the needs of the institutions and expiry dates less than the prescribed 12 months.

5.9 Donated drugs are often in large quantities and short-dated, resulting in limited us and early expiration. This raises further concerns about storage and disposal costs and possible environmental issues in respect of expired drugs. The absence of appropriate waste management initiatives on drugs (donated or otherwise), by the Ministry of Health and the Regional Health Authorities, result in the underutilization of drugs and delays in the disposal of drugs.

5.10 The Ministry of Health has not put measures in place to monitor and review compliance with the related guidelines. **Picture 5** shows examples of expired prescription drugs at the Cornwall Regional, Kingston Public, National Chest and Spanish Town Hospitals. The Bustamante Hospital for Children received the requisite approval from the Ministry of Finance and the Public Service to dispose of 11 boxes of expired drugs in August 2009. The list contains expired items dating as far back as 2003. Similar approval was also obtain by the Spanish Town Hospital in March 2010 to dispose of large quantities of drugs expired between 2005 and 2009. The drugs were still at both hospitals at the date of our audit. Both hospitals gave insufficient funds as reason for the non disposal of the expired drugs.

5.11 The Ministry of Health assumed responsibility for the management of the medical waste incinerator located at the HCL from July 2010. However, since then, there has been no disposal of expired prescription drugs.

Picture 5 Stockpiles of expired prescription drugs at the Cornwall Regional, Kingston Public, National Chest and Spanish Town Hospitals

Container with expired drugs

Cornwall Regional Hospital

Storerooms with expired drugs

Kingston Public Hospital

National Chest Hospital

Spanish Town Hospital

Appendix 1 Actual purchases of prescription drugs by Regions

Table 1: Summary of Drugs Purchased for the Period 2006 to 2010				
Regions	**Purchases from HCL**	**Purchases from Private Suppliers**	**Total Expenditure**	**(%)**
SERHA	1,923,156,339	301,723,754	2,224,880,093	14
SRHA	Data requested not provided	Data requested not provided	1,013,888,098	Incomplete data[5]
NERHA	693,086,245	14,008,411	707,144,656	2
WRHA	1,125,037,058	480,377,320	1,650,414,388	29

Table 2: SERHA's Drugs Purchase for the Period 2006 to 2010				
Period	**Purchase from HCL**	**Purchase from Private Suppliers**	**Total Expenditure**	**(%)**
2006/2007	308,229,196	204,626	308,433,822	0
2007/2008	425,461,339	18,573,533	444,034,872	4
2008/2009	495,092,775	154,890,634	649,983,409	24
2009/2010	694,373,029	128,054,961	822,427,990	16
Total	**1,923,156,339**	**301,723,754**	**2,224,880,093**	**14**

Table 3: SRHA's Drugs Purchase for the Period 2006 to 2010				
Period	**Actual Expenditure to HCL***	**Actual Expenditure to Private Suppliers***	**Total Actual Expenditure**	**(%)**
2006/2007	Data requested not provided	Data requested not provided	52,264,690	Incomplete data
2007/2008	Data requested not provided	Data requested not provided	118,872,443	Incomplete data
2008/2009	Data requested not provided	Data requested not provided	414,635,750	Incomplete data
2009/2010	Data requested not provided	Data requested not provided	428,115,215	Incomplete data
Total	Data requested not provided	Data requested not provided	**1,013,888,098**	Incomplete data

Table 4: NERHA's Drugs Purchase for the Period 2006 to 2010				
Period	**Actual Expenditure to HCL**	**Actual Expenditure to Private Suppliers**	**Total Actual Expenditure**	**(%)**
2006/2007	96,719,313	2,712,444	99,431,757	3
2007/2008	136,661,963	2,198,621	138,860,584	2
2008/2009	203,534,524	5,319,630	208,904,154	3
2009/2010	256,170,445	3,777,716	259,948,161	1
Total	**693,086,245**	**14,008,411**	**707,144,656**	**2**

Table 5: WRHA's Drugs Purchase for the Period 2006 to 2010				
Period	**Actual Expenditure to HCL**	**Actual Expenditure to Private Suppliers**	**Total Actual Expenditure**	**(%)**
2006/2007	182,364,141	54,955,569	237,319,710	23
2007/2008	168,783,371	144,318,912	313,102,283	46
2008/2009	394,423,178	89,273,412	483,696,590	18
2009/2010	379,466,368	191,829,427	571,295,805	34
Total	**1,125,037,058**	**480,377,320**	**1,650,414,388**	**29**

[5] Sufficient data was not provided to calculate percentage.

Appendix 2 Demand for Pharmacy Services

Hospitals		Yearly dispensing statistics				
BHC	**Description**	**2006**	**2007**	**2008**	**2009**	**2010**
	No. of patients	22,848	43,780	54,811	No data provided	No data provided
	Percentage increase	-	92	25	No data provided	No data provided
	No. of drugs supplied/dispensed	46,976	87,527	118,927	No data provided	No data provided
	Percentage increase	-	86	36	No data provided	No data provided
CRH	**Description**	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**2009/10**
	No. of patients	81,588	88,392	94,801	106,675	105,070
	Percentage increase	-	8	7	13	(2)
	No. of drugs supplied/dispensed	213,150	254,784	284,448	348,924	359,676
	Percentage increase	-	20	12	23	3
KPH	**Description**	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**2009/10**
	No. of patients	86,953	95,708	94,442	124,007	116,926
	Percentage increase	-	10	(1)	31	(5)
	No. of drugs supplied/dispensed	175,485	208,410	208,571	287,078	279,649
	Percentage increase	-	19	0	38	(3)
NCH	**Description**	**2006**	**2007**	**2008**	**2009**	**2010**
	No. of patients	10,254	8,664*	12,103*	17,333	No data provided
	Percentage increase	-	(16)	40	43	No data provided
	No. of drugs supplied/dispensed	26,478	23,930	26,926**	40,226	No data provided
	Percentage increase	-	(10)	13	49	No data provided
STH	**Description**	**2006**	**2007**	**2008**	**2009**	**2010**
	No. of patients	66,273	63,461	83,494	92,926	No data
	Percentage increase	-	(4)	32	11	No data
	No. of drugs supplied/dispensed	185,895	195,485	233,538	304,542	No data
	Percentage increase	-	5	19	30	No data

*NCH: No. of Patients statistics for Feb 06, Mar 06 and Aug 08 not available;

**NCH: No. of Drugs dispensed statistics for Aug 08 not available

Appendix 3 Pharmacists and Pharmacy Technicians by Region

Regional Health Authorities					
Southern Regional Health Authority (SRHA)	**LEVELS**	**POST**	**Filled**	**Vacant**	**% Shortage**
May Pen Hospital	Level 1	2[6]	-	2	
	Level 2	1	-	1	
	Level 3	1[7]	1	0	
Percy Junior Hospital	Level 1	1	1	0	
	Level 2	1	-	1	
Lionel Town Hospital	Level 1	-	-	-	
	Level 2	1	-	1	
Chapelton Hospital	Level 1	-	-	-	
	Level 2	1	-	1	
Mandeville Regional Hospital	Level 1	4[8]	-	4	
	Level 2	1	1	0	
	Level 3	2[9]	2	0	
	Level 4	1	1	0	
	Level 5	-	-	-	
Black River Hospital	Level 1	4[10]	-	4	
	Level 2	1	-	1	
	TOTAL	**21**	**6**	**15**	**71%**
South East Regional Health Authority (SERHA)	**LEVELS**	**POST**	**Filled**	**Vacant**	**% Shortage**
Bustamante Hospital for Children	Level 1	5	1	4	
	Level 2	1	1	0	
	Level 3	1	1	0	
	Level 4	1	1	0	
	Level 5	-	-	-	
National Chest	Level 1	-	-	0	
	Level 2	-	-	0	
	Level 3	1	1	0	
	Level 4	-	-	-	
	Level 5	-	-	-	
Kingston Public Hospital and Victoria Jubilee Hospital	Level 1	15	1	14	
	Level 2	2	2	0	
	Level 3	1	1	0	
	Level 4	2	2	0	
	Level 5	1	1	0	
Kingston and St. Andrew Health Department	Level 1	5	0	5	
	Level 2	13	2	11	
	Level 3	1	1	0	
	Level 4	1	1	0	

[6] One assigned to Clarendon Health Centre
[7] Assigned to Clarendon Health Centre
[8] One assigned to Manchester Health Centre
[9] One assigned to Manchester Health Centre
[10] One assigned to St. Elizabeth Health Centre

Regional Health Authorities					
	Level 5				
Spanish Town Hospital	Level 1	2	2	0	
	Level 2	5[11]	3	2	
	Level 3	2	2	0	
	Level 4	1	1	0	
	Level 5	-	-	-	
Princess Margaret Hospital	Level 1	2[12]	0	2	
	Level 2	2[13]	0	2	
	Level 3	1	1	0	
	Level 4				
	Level 5				
Bellevue Hospital	Level 1	2	0	2	
	Level 2				
	Level 3	1	1	0	
	Level 4	1	1	0	
	Total:	**69**	**27**	**42**	**61%**
North East Regional Health Authority (NERHA)	**LEVELS**	**POST**	**Filled**	**Vacant**	**% Shortage**
St. Ann's Bay Hospital	Level 1	1[14]	1	-	
	Level 2	1	-	1	
	Level 3	1	1	0	
	Level 4	1	1	0	
	Level 5	-	-	-	
Port Maria Hospital	Level 1	2[15]	-	2	
	Level 2	1	-	1	
	Level 3	1	-	1	
	Level 4	-	-	-	
	Level 5	-	-	-	
Annotto Bay Hospital	Level 1	-	-	-	
	Level 2	1	-	1	
	Level 3	1	-	1	
	Level 4	-	-	-	
	Level 5	-	-	-	
Port Antonio Hospital	Level 1	3	-	3	
	Level 2	2[16]	2	-	
	Level 3	-	-	-	
	Level 4	1	-	1	
	Level 5	-	-	-	
	TOTAL	**16**	**5**	**11**	**69%**
Western Regional Health Authority (WRHA)	**LEVELS**	**POST**	**Filled**	**Vacant**	**% Shortage**

[11] Three assigned to St. Catherine Health Centre
[12] One assigned to St. Thomas Health Centre
[13] One Assigned to St. Thomas Health Centre
[14] Assigned to St. Ann's Bay Health Department
[15] Assigned to St. Mary Health Department
[16] One Assigned to Port Antonio Health Department

Regional Health Authorities					
Cornwall Regional Hospital	Level 1	5	1	4	
	Level 2	2[17]	2	0	
	Level 3	3[18]	3	0	
	Level 4	-	-	-	
	Level 5	1	1	0	
Noel Holmes Hospital	Level 1	2	-	2	
	Level 2	1	1	-	
	Level 3	-	-	-	
	Level 4	-	-	-	
	Level 5	-	-	-	
Savanna-La-Mar Hospital	Level 1	9	1	8	
	Level 2	-	-	-	
	Level 3	1	-	1	
	Level 4	1	1	-	
	Level 5	-	-	-	
Falmouth Hospital	Level 1	2	1	1	
	Level 2				
	Level 3				
	Level 4	1	1	0	
	Level 5	-	-	-	
	TOTAL	**28**	**12**	**16**	**57%**
	G/TOTAL	**134**	**50**	**84**	**63%**

Pharmacy Technicians

Southern Regional Health Authority (SRHA)

Thirty-six established Pharmacy Technician posts, 11 (31 per cent) of which are vacant

South East Regional Health Authority (SERHA)

Twenty-seven established Pharmacy Technician posts, all are filled

North-East Regional Health Authority (NERHA):

Seventeen established Pharmacy Technician posts, 2 (12 per cent) of which are vacant.

Western Regional Health Authority (WRHA):

Twenty-three established Pharmacy Technician posts, 8 (35 per cent) of which are vacant

[17] One assigned to the Catherine Hall Health Centre

[18] One assigned to the Montego Bay Health Centre

Appendix 4 Excess and expired drugs removed from wards at the Kingston Public Hospital

WARD 1A				
NAME OF DRUG	**STRENGTH**	**QUANTITY SEEN**	**QUANTITY RETRIEVED**	**EXPIRED**
Lactated Ringers		5X24	2x24	
Dextrose Water	0.1	1X24+18	12 bags	6 bags
Sterile water for injection 50ml		7	3	
DPH Capsule	25mg	43	28	
Frusemide injection	20mg/2ml	82	30	
Atropine injection		60	50	
Vitamin k injection		88	78	
Dexamethasone injection	250mg	49	40	
Chlorpromazine injection		40	35	
Piriton injection		12	10	
UPPER NUTTAL WARD				
NAME OF DRUG	**STRENGTH**	**QUANTITY SEEN**	**QUANTITY RETRIEVED**	**EXPIRED**
Uristix 10-test		9	5	2
Gravol	5omg	25	9 (16 vials were opened)	
Inj. Amphotercin B		5		2
WARD 2B				
NAME OF DRUG	**STRENGTH**	**QUANTITY SEEN**	**QUANTITY RETRIEVED**	**EXPIRED**
Sodium Bicarbonate injection		9	3	
Apresoline injection		24	19	
Valium injection		20		9
Lactated Ringers			36bags	
WARD 3B				
NAME OF DRUG	**STRENGTH**	**QUANTITY SEEN**	**QUANTITY RETRIEVED**	**EXPIRED**
Hydrocortisone injction	250mg	2x10 + 6	1x10	
Digoxin injection		7 vials	5 vials	
Dextrose Water	5%	2x24	1x24	
Lactated Ringers		2x24	1x24	

Appendix 5 Work Maintenance Orders requesting repairs to the air conditioning units at Spanish Town Hospital pharmacy

Date	Description of order (Exact Quotations from Maintenance Work Order)
30/12/06	"The A/c unit that serves the outpatient department leaks in the male bathroom. Please arrange for repair."
15/03/07	"There is a leak from the A/c unit and this is occurring in the male bathroom. Please arrange for repairs."
11/0607	"The A/c unit that serves the storeroom is leaking. Please arrange for repairs. Thanks."
4/07/07	"Could you please arrange for both A/c units to be checked?" Since the power cut(s) I have noticed that they are not working as before."
17/07/07	"Please arrange for replacement of ceiling tiles in the Pharmacy especially in those areas with zinc roof. The places where tiles have fallen out caused direct heat transfer and reduce the efficiency of the A/C unit."
19/07/07	"The other A/c unit that serves the out-patient dept, lunch room and the chief pharmacist's office has also stopped working since today. Please arrange for urgent repairs."
30/07/07	"The A/c unit that serves the outpatient area is not cooling, it has stopped working. Please arrange for repair."
31/07/07	"The A/c unit that was repaired last week has stopped working since this afternoon. Please arrange for repairs."
03/10/07	1. "The A/c unit that serves the storeroom has started flooding the room. Please arrange for repair urgently." 2. "The A/c unit that serves the outpatient, chief pharmacist's office and the lunch room is still out of service. Please arrange for repairs. Thanks."
27/11/07	"The A/c unit in the storeroom is leaking again and flooding the storeroom. Please check for us. Thanks."
06/12/07	"The A/c unit has frozen ice over it again. Please arrange for repairs. Thanks."
14/03/08	"The A/c unit in the out-patients' department of the pharmacy needs to be serviced. Please arrange for same. Thanks."
8/6/08	"The A/c unit in storeroom is leaking; the board used for partition in the storeroom is being affected and has started swelling. Please arrange for urgent repair."
10/06/09	"The A/c in the storeroom has flooded the pharmacy. Water has even reached out to the waiting areas. Please arrange for urgent repair."
15/06/09	"The A/c that serves the Out-patient dispensing area is out of service. Please arrange for urgent repair."
23/06/08	"The A/c in the storeroom is not working. Please arrange for urgent repairs."
01/07/08	"Please arrange for urgent repairs of A/c unit. **The unit was not working effectively yesterday so it was left on last night to see if it could build up a certain level of coolness.** When we came this morning the storeroom has flooded and the passage way leading to the front entrance. Thanks for your attention to the matter."
21/10/08	1. 'The A/c unit in the outpatient dept that is above the medication self is dripping water on the shelf." 2. "The central A/c unit in the storeroom is leaking large amount of water. Please

Date	Description of order (Exact Quotations from Maintenance Work Order)
	arrange for repairs."
04/12/08	"The A/c unit in the outpatient dispensing area is not working properly. Please arrange for urgent repairs."
13/03/09	1. "The A/c unit in the outpatient dispensing area drips consistently …" 2. "The split A/c unit in the storeroom is out of service. Please arrange for repairs to both. Thanks"
14/04/09	"The central A/c unit in the storeroom is icing up. Please have it repair as it is not cooling effectively."
20/05/09	"The A/c unit that serves the outpatient area of the pharmacy has stopped working. Please arrange for repairs."
14/07/09	"The split unit in the outpatient dispensing area in not cooling (efficiently). Please arrange for repairs. Thanks."
24/08/09	"The A/c units in both out-patient dispensing area and the storeroom are not working. I understand the breaker has tripped out on Saturday since then they are not working. Please arrange for urgent repair."
28/8/09	"The A/c unit in the O.P.D *(outpatient)* department is not working. Please arrange for urgent repair."
24/09/09	"The A/c unit in the storeroom has iced up again. Consequently it is not cooling. Please arrange for urgent repair."
12/04/10	"Mould comes out of the A/c each time it is turned on. Staff members are being affected by the mould they are having sinus & throat irritation. Kindly have unit assessed and problem corrected."
07/05/10	"The A/c unit in the storeroom is leaking again. Please arrange for repair."
14/05/10	The A/c unit in the pharmacy outpatient is making strange sounds (Similar to an animal groaning in main e.g. a cow)
13/07/10	"The A/c unit in the storeroom is again not working properly. The temperature is hot. Please arrange for repair."
27/07/10	"The ceiling tiles in the inpatient are filled with moulds. It is affecting the health of the workers assigned there. There seems to be a leak in the A/c pipe in the roof so even though the tiles were replaced recently they are now covered with moulds. Please arrange for repairs."
17/08/10	"The A/c unit in the storeroom is again leaking badly. It is also not cooling effectively. Please arrange for repairs. Thanks."