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HERON Technology Corporation

Surveillance Brochure

INTEGRATED DISEASE SURVEILLANCE AND CONTROL SYSTEM

This brochure addresses the importance of an Integrated Disease Surveillance and Control System and how Heron incorporates it into its Patient Administration System (PAS).

From *Injury Control and Safety Promotion*
Vol.9 No. 4.
December 2002

Injuries in Jamaica

By Yvette Holder,
MPH, CDC,
Atlanta, Georgia.
pages 217 – 218



“the JISS/PAS is, to the best of my knowledge, the first, and probably still the only, fully computerized, wide-area networked national surveillance system in the western hemisphere.”

Yvette Holder, CDC

It has been estimated that 12% of the global burden of disease is due to injuries...The following papers share the experience of establishing a national injury morbidity surveillance system, dealing with issues that are common to many situations.

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Integrated Disease Surveillance and Control

Introduction:

During the past few years there has been a significant increase in the awareness of the importance of Integrated Disease Surveillance and Control Systems [SARS in 2003 for example]. This has escalated to the point where on May 20, 2003, it was reported in the Toronto Star that *“WHO Director-general Dr. Gro Harlem Bruntland appealed to governments worldwide to work together to fight SARS, which has made more than 7,700 people ill in 31 locations.”*

Continued on page 5



World Health Organization

Which Infectious Diseases are Important to Track in Your Country?

The Heron Integrated Disease Surveillance and Control System can be locally modified to track all of the noted Diseases and/or Topics.

- Cholera
- Dengue
- Diarrhoeal diseases / dysentery
- Diphtheria
- Dracunculiasis
- Ebola haemorrhagic fever
- Haemorrhagic fevers
- Haemophilus influenza B
- Hepatitis
- HIV/AIDS
- Influenza

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**Canadian Society for International Health (CSIH)
From Synergy, Vol. 13 No. 1, Spring 2001**

Published with the support of the Pan American Health Organization (PAHO) and the Canadian International Development Agency (CIDA).

Canadian company involved in Jamaica injury surveillance

Injuries treated in the accident and emergency departments of hospitals across Jamaica cost the health care system up to 35% of its total annual operating budget. Now one of Canadian Society for International Health's (CSIH) newest corporate members, Heron Technology Corp. [HTC] of Toronto, is helping to track those injuries.

HTC has been working in Jamaica for the past three years as part of a Citizen Security and Justice Program developed by the Jamaican government and the Inter-American Development Bank. The project began in 1998 when HTC integrated a Violence-Related Injury Surveillance System (VRISS) into the computerized admitting/discharge/transfer processes at the 450-bed Kingston Public Hospital to allow patient information on violence-related injuries to be recorded.

In collaboration with the U.S. Centers for Disease Control and Prevention, the system is gathering data on violence-related injuries treated in the accident and emergency departments of all hospitals in North America and the Caribbean. The aim is to better understand who is at risk, where the incidents occur, who is perpetrating violence within society, and what the cost is to the health sector.

Since then, the system has been expanded to include the surveillance of all injuries and has been extended to four other hospitals in Jamaica; soon it will be operating in 18 more hospitals using HTC's Patient Administration software.

Now known as the Jamaica Injury Surveillance System (JISS), the data collection program allows injuries treated in hospital A&E departments to be categorized as unintentional or accidental, violence-related, attempted suicide, or motor vehicle-related.

According to Dr. Elizabeth Ward, chief of epidemiology in the Jamaica Ministry of Health, the major advantages of the HTC software include *"its ability to capture specialized data, for example, injury data, and its ability to have access to the patient administration system data in one computerized format that can be merged at a central level."* This decreases the turnaround time for A&E and discharge data. She adds: *"The patient administration system has proven to be a cost-effective means of gathering health data."*

The information now being gathered by the JISS is being used to shape Ministry policy, and to plan prevention and intervention programs. New studies can be implemented at any time without programming changes to the system. A study on asthma is already scheduled.

The health ministry has produced a comprehensive manual on use of the JISS, an external report writer has been used to gather and analyze the data. For more information, contact Dr. Ward by e-mail at the Jamaica Ministry of Health's Health Promotion and Protection Division: eward@epi.org.jm

Media release: May 30, 2003, Markham, ON

Heron Technology Corporation announces that the Pan American Health Organization (PAHO) sent a large delegation to Jamaica to review the Heron Patient Administration System (PAS), and Injury Surveillance System.

PAHO, the Regional Office of the World Health Organization (WHO), sent a delegation of eight persons to visit with Ministry of Health officials in Jamaica from March 10 to 14, 2003. The nature of the trip was to review in detail the success of the country's PAS implementation, now operational in 11 of the largest hospitals in Jamaica, representing over 70 % of the country's 4,000 hospital beds.

The PAHO delegation consisted of 4 PAHO Officers, and 4 senior health officials from Eastern Caribbean countries interested in computerization. The delegation visited 3 local hospitals to observe the PAS and Injury Surveillance systems in live operation, and conducted meetings with senior Ministry of Health, Regional and Hospital officials. Following this PAHO delegation visit to Jamaica, Heron Technology has been invited to visit area countries, and interest has been expressed in emulating the success of Jamaica throughout the Region. A major consideration is to have a standardized Surveillance [Injury, HIV/AIDS, OHS, TB, etc.] System throughout the Caribbean Region, and this remains a possibility.

To read the rest of this article, please visit our website.

ZOOM-IN on the pdf to read the letter


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ANY REPLY OR SUBSEQUENT REFERENCE
TO THIS COMMUNICATION SHOULD BE
ADDRESSED TO THE PERMANENT
SECRETARY AND THE FOLLOWING

November 14, 2002

Ron Hébert
Heron Technology

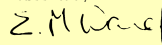
Canadian Awards for International Cooperation - Jamaica PAS

The Ministry of Health Jamaica embarked on a process of computerization of hospitals. This has been done utilizing a Patient Administration System (PAS) developed by Heron Technology Corporation, which has seen the computerisation of eleven of the twenty-two hospitals across the island. This system provides a standardised data platform that collects data on 70% of the discharged patients from hospitals islandwide.

The PAS has been customised allowing for the addition of modules readily adaptable to the users needs. In Jamaica four modules have been added to the PAS to allow for injury surveillance. This system called the Jamaica Injury Surveillance System (JISS) contains modules for tracking motor vehicle accidents, violence related injuries, accidental injuries and attempted suicides. The availability of these data characterising injuries has allowed for production of reports both at the local and national level and provides guidance for an intersectoral approach to activities aimed at reducing the disease burden due to injuries.

Another planned development is to add an occupational injury module to JISS and this will be presented in June 2003 to other health personnel within the Caribbean region and to PAHO Occupational Health and Safety Division. These developments are a clear indication of the interest in what Jamaica is doing re the utilisation of computers in health care within the PAHO region.

Yours sincerely



Dr. Elizabeth Ward
Director, Disease Prevention and Control

Data collected from an Integrated Disease Surveillance and Control System

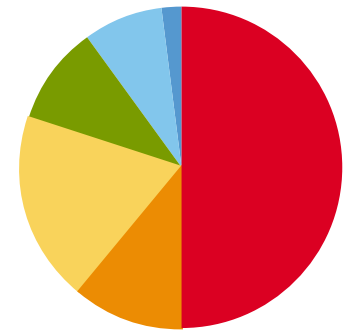
Using Heron Software in Jamaican Hospitals

| Code | Question | Answer | Total | | | |
|------------------|---|---------------------------------|---------------------------------|----------------------------------|-------|-----|
| 0002 | Violence Related 06 circumstance of injury | 000 | not sought/obtained | 33 | 4% | |
| | | 001 | fight/argument | 234 | 77% | |
| | | 002 | robbery/burglary | 19 | 7% | |
| | | 004 | gang related | 38 | 4% | |
| | | 005 | mob/riot | 8 | 3% | |
| | | 006 | sexual assault | 1 | | |
| | | 007 | child abuse | 4 | 1% | |
| | | 008 | police shooting | 2 | 1% | |
| | | 006 | other | 8 | 3% | |
| | | 07 victim-perpetrator relation | 000 | not sought/obtained | 5 | 2% |
| | | | 001 | girl/boyfriend ex-girl/boyfriend | 30 | 11% |
| | | | 002 | husband/wife common-law ex | 11 | 4% |
| | | | 003 | parent | 3 | 1% |
| | | | 004 | other relative | 19 | 7% |
| | | | 005 | friend | 22 | 8% |
| | | | 006 | acquaintance | 145 | 52% |
| | | | 007 | stranger | 33 | 12% |
| | | | 006 | official/legal authority | 7 | 3% |
| | | | 008 | other | 1 | |
| | | 08 location of occurrence | 000 | not sought/obtained | 3 | 1% |
| | | | 001 | home | 84 | 30% |
| | | | 002 | institution | 8 | 3% |
| | | | 003 | school | 7 | 3% |
| | | | 004 | street/highway | 158 | 57% |
| | | | 005 | public bus/train/parking | 3 | 1% |
| | | | 007 | industrial/construction | 2 | 1% |
| | | | 008 | commercial area/shop/market | 4 | 1% |
| | | | 009 | public hdy/recreation area | 8 | 3% |
| | | | 000 | not sought/obtained | 1 | |
| | | 09 method of injury | 001 | blunt object (pipe, bat, etc.) | 65 | 23% |
| | | | 002 | push/shove/bodily force | 30 | 11% |
| | | | 003 | stab/sharp object/human | 157 | 57% |
| | | | 004 | gun shot | 18 | 6% |
| | | | 005 | sexual assault | 1 | |
| | | | 007 | chemical burn | 1 | |
| 006 | thermal burn (fire/hot liquid) | | 3 | 1% | | |
| 008 | other | | 1 | | | |
| 009 | unknown | | 277 | 100% | | |
| 10 alcohol use | 000 | | not sought/obtained | 2 | 1% | |
| Violence Related | 003 | suspected | 1 | | | |
| | 009 | unknown | 274 | 99% | | |
| | 277 | Percentage of all registrations | | 16% | | |
| 0003 | suicide | 003 | conflict within the family | 1 | 33% | |
| | | 009 | interpersonal conflict | 2 | 67% | |
| | | 003 | poisoning-ingestion | 2 | 67% | |
| | 06 previous attempts | 005 | cutting/percing | 1 | 33% | |
| | | 002 | no | 1 | 33% | |
| | | 009 | unknown | 2 | 67% | |
| | 09 alcohol use | 003 | suspected | 1 | 33% | |
| | | 009 | unknown | 2 | 67% | |
| | 10 drug use | 003 | suspected | 1 | 33% | |
| | | 009 | unknown | 2 | 67% | |
| | Suicide | J | Percentage of all registrations | | 0.17% | |

Format of the summary report generated from JISS at each hospital for a violence related injury Emergency confirmation statistical report, June 1, 2000 to June 30, 2000. Report for detail – content 0001 0002 0003 0004.

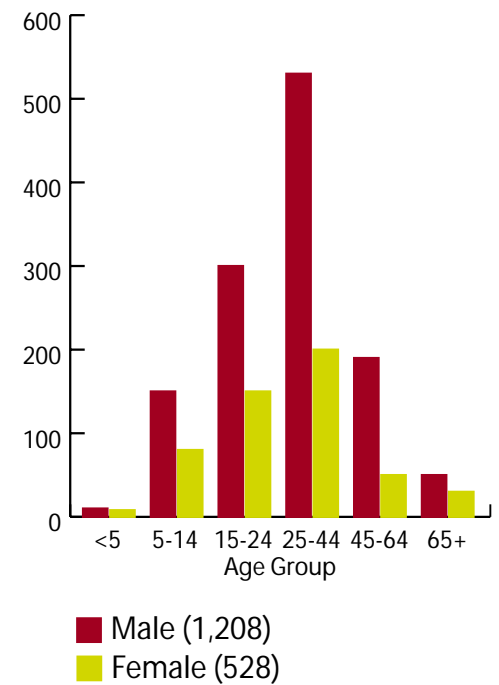


Distribution of non-fatal violence-related injuries as recorded at the KPH (Kingston Public Hospital), September to December 1999, Kingston and St. Andrew, Jamaica.



- Home
- School/Institution
- Street
- Other – cultural/sports event
- Industrial/Commercial
- Farm/Countryside

Place of occurrence of unintentional injuries in three hospitals in Jamaica, December 1, 1999 – May 31, 2000



Gender and age group breakdown of MVI's recorded at three hospitals in Jamaica, December 1, 1999 – May 31, 2000

■ Injuries in Jamaica *continued from page 1*

THE ESTABLISHMENT OF A JAMAICAN ALL-INJURY SURVEILLANCE SYSTEM [219-225]

The data collection process took **one and a half to TWO MINUTES per patient**. ...This system **may be considered a SUCCESS** as it not only continues to operate up to this time, **having grown from a pilot to a routine national system incorporating 11 tertiary care institutions**.

Since the data were part of the PAS [Patient Administration System], additional information was available on admitted patients, including the affected body part, surgical procedures performed, length of stay, and outcome of the admission. In addition, the **LOCATION** of the injury and demographic data for inpatients and outpatients could be linked to the JISS data and downloaded for further analysis in other statistical packages.

In most instances, when the registration clerk asked the patient, **'What happened?' they obtained all the required information**. Once a project was selected, the user was prompted to select the category of injury for the specified project thus forcing the user to complete data entry. **The system did NOT allow the user to escape before completing each question**.

By monitoring the **national injury profile**, the **JISS provides data to support needed policy changes** to minimize the impact of injuries on the health services and on the health of the population.

A PROFILE of INJURIES in JAMAICA [227 – 234]

This study analyses 6 months of data from three hospitals **participating in a COMPUTERIZED emergency room-based Jamaica Injury Surveillance System** since 1999. The categories of injuries tracked were unintentional, violence-related and motor vehicle-related.

Conclusion: The JISS has been extended to other hospitals in Jamaica and should be an important ongoing research tool in injury control and for **monitoring the effectiveness of intervention in Jamaica**. **The system could be a model for other developing and DEVELOPED countries**.

COMPARATIVE EVALUATION of DIFFERENT MODES of a NATIONAL ACCIDENT and EMERGENCY DEPARTMENT-BASED INJURY SURVEILLANCE SYSTEM [235-239].

The objective was to conduct a comparative evaluation of two injury surveillance systems in operation in the Accident and Emergency departments of public hospitals in Jamaica.

...This led initially to a manual data collection system on all conditions presenting to the Accident & Emergency Department of all hospitals. ...Operating in five of the major hospitals is a **COMPUTERIZED** system for the general administration of the institutions' clients, including registration of patients in A&E. This system was modified in September 1999 to permit collection of additional information on persons presenting to A&E as a result of an injury event.

Conclusion. Nevertheless, both the data and feedback from stakeholders indicate that **the PAS/JISS is more user-friendly**

and a truer reflection of the injury situation, ...

[241-247] IMPLEMENTING a HOSPITAL BASED VIOLENCE RELATED INJURY SURVEILLANCE SYSTEM – a BACKGROUND to the JAMAICAN EXPERIENCE.

Violence, a leading cause of injuries and death, is recognized as a major public health problem... In 1998, the VRISS, based on the International Classification of External Cause of Injury (ICECL) was implemented in the A&E Department of Jamaica's tertiary care hospital, KPH... To analyze the study data, the study team exported the four new variables and categories for violence-related injuries from the **UNIX-based PAS** to an ASCII file and then into HIRS (HIRS 2.0d 1997) for analysis... The collection of data on violence-related injuries **has been cost-effective** because no additional hardware or software was required... **Fourth, the VRISS data have been linked to in-patient hospital data...**

The location data have been exported into a **Geographical Information System [GIS]** (ARC View 3.1) to assist in mapping the occurrence of violence in the Kingston metropolitan region.

In an environment with limited and restricted resources, collecting data can be very difficult. The VRISS demonstrates that even in an environment with limited resources, data on violence related injuries **can be collected and used effectively to plan programs and guide policy and program development**.

SURVEILLANCE of INTERPERSONAL VIOLENCE in KINGSTON, JAMAICA: an EVALUATION [249-253]

Evaluation design: The system was evaluated for **simplicity, flexibility, acceptability, sensitivity, predictive value positive, as well as utility of the data using the MMWR guidelines...** After revision of the system to address the aforementioned issues, the VRISS should initially be **EXPANDED to hospital sites** using the PAS to facilitate data collection and analysis...

NON-FATAL VIOLENCE-RELATED INJURIES in KINGSTON, JAMAICA: [255-262]

Intentional and non-intentional injuries are a major public health problem and cost societies a great deal in immediate monetary costs... In Jamaica, violence-related injuries (VRIs) are a major cause of morbidity and mortality... **Data collection was done by trained registration clerks in the A&E department, and entered into the hospital's COMPUTERIZED UNIX-based Patient Administration System [PAS]**.

EPILOGUE: THE JAMAICAN INJURY SURVEILLANCE SYSTEM: LESSONS LEARNT

As with the introduction of any new system, the JISS was **initially** viewed as an imposition, requiring additional effort and resources for its operation.

The pilot was so successful that the system was reproduced at other sites, which met the afore-mentioned criteria, using the process described above. Documentation ensured that the basic infrastructure was in place at each implementation site and that **systems existed for continuity in the face of staff mobility**.

"The system could also be a model for other developing and developed countries."
Yvette Holder, CDC

Media release: September 22, 2003, Markham, ON

The Jamaica Injury Surveillance System (JISS) and Patient Administration System (PAS) is cited by the CDC, and the JISS is capable of e-tracking any disease/topic.

While there are indeed many implementations of health care computerization around the world, it is rare to have a particular one cited by the CDC [Centers for Disease Control], Atlanta, Georgia, USA, as one which "could also be a model for other developing and developed countries":

This is one of the many extremely positive comments attributed to the health care IT implementation undertaken by the Jamaica Ministry of Health (JMOH), starting in 1997, under the stewardship of Mrs. Marcia Gibson, Director of the Health Reform Unit. Recently an international team of 26 health sector experts in late 2002 exhaustively reviewed the implementation. The team included 6 experts on Epidemiology and Disease Control and Prevention from the CDC. The other 20 team experts were from the JMOH, user-site hospitals in Jamaica, Clemson University, SC, USA, The University Hospital of the West Indies, and the University of North Carolina at Chapel Hill, NC, USA.

"the JISS...has the flexibility to be coded locally for data collection (electronically) on any selected disease or topic." (Injury, HIV/AIDS, SARS, etc.)

**Dr. Elizabeth Ward, Director,
Disease Prevention and Control, JMOH**

The computerized health care system under review in Jamaica is referred to as the JISS (Jamaica Injury Surveillance System) which is linked to the PAS (Patient Administration System), collectively known as the JISS/PAS. The review is contained in 8 articles (57 pages) that are presented in the international journal 'INJURY CONTROL and SAFETY PROMOTION' [Volume 9, No. 4, December 2002], published by Swets & Zeitlinger, Lisse, The Netherlands. Yvette Holder (visiting research fellow, CDC) wrote the Guest Editorial in the IC&SP journal. Ms. Holder recently noted that "the JISS/PAS is, to the best of my knowledge, the first, and probably still the only, fully computerized, wide-area networked national surveillance system in the western hemisphere."

The CDC team, and the other members of the review team, provided many important key insights into the operation of the JISS/PAS over the five-year period 1998 - 2002. The report included such statements as: "The pilot was so successful that the system was reproduced at other sites"; "The JISS provides data to support needed policy changes"; "The location data have been exported into a Geographical Information System (GIS), etc."

Dr. Elizabeth Ward, Director, Disease Prevention and Control, JMOH, is the co-author of 5 of the articles in IC&SP. In the articles it is noted that: "the JISS...has the flexibility to be coded locally for data collection (electronically) on any selected disease or topic." (Injury, HIV/AIDS, SARS, etc.) In Canada such disease surveillance is paper-based.

Heron Technology Corp, Markham, ON, Canada, developed the JISS/PAS application software suite. The PAS software is also deployed in Canadian hospitals, and meets the exacting reporting requirements of both the Provincial and Federal Governments. In summary, Jamaica has now implemented a computerized health sector management system that is indeed today a 'model' for other developing countries, and developed countries, meaning the world. The two most important issues that must be taken into account by any country planning to computerize its health care sector are: **affordability** and **functionality**.

■ Integrated Disease Surveillance and Control

continued from page 1

"It has never been clearer than today that a secure, healthy future for us all depends on the co-operation across borders and between institutions," Brundtland told the opening session of the World Health Assembly in Geneva.

New [non-manual] surveillance systems are required:

One of the worst hit areas in the world for SARS was Toronto, where over 40 persons have died from this respiratory disease. It was reported in the Toronto Star on June 14, 2003, under the heading "How experts untangled threads of second outbreak", that "For most of the two outbreaks, they have sifted through paperwork by hand." "We've been fighting a nineteenth century type of disease with nineteenth century technology," said one official.

"The link between SARS I and SARS II is heartening news for Toronto, which has been criticized by the WHO for not being able to trace some of the cases.

To read the rest of this article, please visit our website.



World Health Organization

■ Which Infectious Diseases are Important to Track in Your Country? continued from page 1

- Intestinal nematodes
- Maternal and neonatal tetanus
- Sexually transmitted diseases
- Japanese encephalitis
- Onchocerciasis
- Shigellosis
- Leishmaniasis
- Pertussis
- Schistosomiasis
- Leprosy
- Plague
- Tuberculosis
- Lymphatic filariasis
- Pneumococcus
- Typhoid fever
- Malaria
- Poliomyelitis
- Varicella
- Measles
- Rabies
- Vitamin A deficiency
- Meningitis
- Rotavirus
- Yellow fever
- Mumps
- Rubella
- Zoonoses
- SARS

■ Which Health Topics are Important to Track in Your Country?

- Injury
- OHS (Occupational Health & Safety)
- Asthma
- Smoking
- Child Health

Application Software Components of a Hospital Information System (HIS)

The main Application Software IT components within an HIS are:

- Patient Administration System (PAS)
- Diagnostic Imaging System
- Middleware
- Financial Applications
- Clinical Laboratory
- Other Clinical Applications

Introduction:

A Hospital Information System (HIS) consists of many Clinical and Financial application software modules, over 20 in total. The question often arises as to where to begin when it has been decided to implement an HIS throughout the country or region.

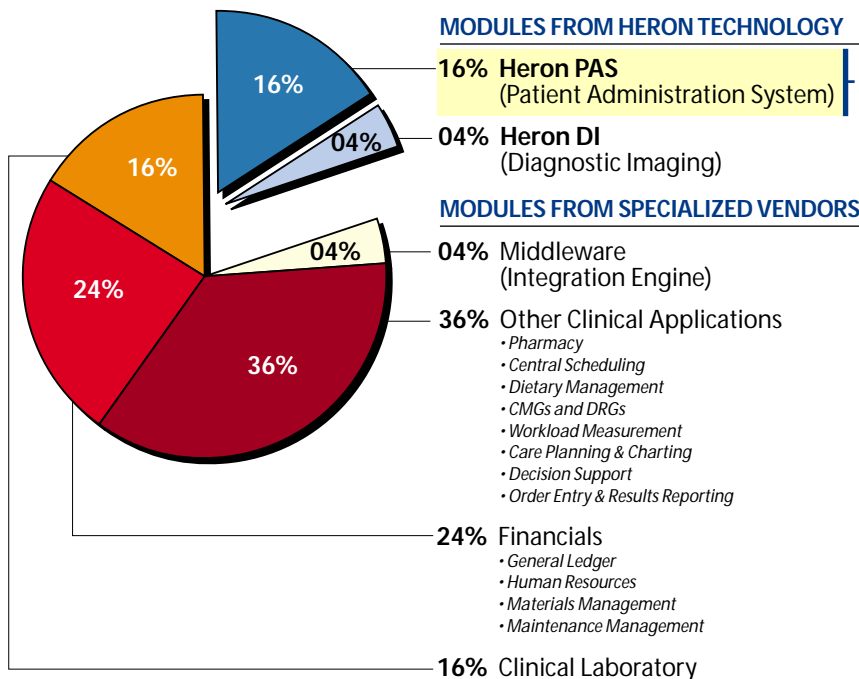
The challenge to implement a complete HIS is daunting, taking probably 10 to 15 years, yet the starting point is straight forward – it is with the Patient Administration System (PAS).

The PAS provides the basis for establishing the database of patients and encounter history, that will ultimately be

accessed by the many Clinical modules that will be implemented over subsequent years.

The diagram below presents an approximate allocation of financial resources required to implement an HIS.

The HERON PAS and Epidemiological Surveillance software products incorporate the many system and design features developed at Canadian and Jamaican hospitals, and most importantly from valuable user feedback from the development of the Canadian hospital system over the past thirty years.



HERON PAS

- Central Patient Index
- Admission, Discharge, Transfer
- Outpatients Registration; Transfer to Inpatient
- Accident and Emergency; Transfer to Inpatient
- Billing and Accounts Receivable
- Insurance Claims Processing; Workman's Compensation
- Health Records Abstracting (ICD 10)
- Report Writer
- Government Statistical Reporting
- Agency Reporting: World Bank, CDC, PAHO, WHO, etc.

• Disease Surveillance and Control

System Data Gathering & Reporting on:

- SARS
- Injury
- Asthma
- HIV/AIDS
- Occupational Health and Safety (OHS)
- TB
- Malaria, etc.

Canadian Commercial Corporation (CCC):



A very important consideration associated with international marketing is the aspect of the purchasing country receiving a 'Sovereign' Guarantee from the selling country. This sovereign guarantee was extended to the Jamaica MOH by CCC in 1997 for the HERON PAS implementation, and can be anticipated in other countries, depending upon the business contract. CCC has shown considerable interest in HERON through an article in the 1998 CCC Annual report and through a write up in CCC's newsletter, the Exporter, in 1999.

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