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Development and Piloting of National Injury Surveillance System of Sri Lanka

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Objective

Designing, developing and piloting a web-based Injury Surveillance System for Sri Lanka.

Introduction

In Sri Lanka, a major drawback in injury prevention is the lack of complete, accurate and timely data. To fulfill this data need, in 2006, Sri Lanka's Trauma Secretariat piloted an Injury Surveillance System (ISS) in four hospitals. This comprised of two parts: a paper-based data collection tool (Trauma Surveillance Record or TSR) and its corresponding software application. TSR recorded ICD-10 Chapter XIX codes related to the diagnoses of injuries, but did not record the Chapter XX codes pertaining to external causes of morbidity which provide essential knowledge for injury prevention. The software application was built using proprietary technologies that could lead to increased costs and associated dependencies with vendors. The system was unable to comply with the changing data needs of the Ministry of Health (MoH) without a major retooling. Consequently, in 2011, the MoH made changes in the TSR, but the software application was unable to handle those changes. The ISS was evaluated by three independent teams which recommended discontinuing its use and suggested the development of a new system.

Methods

First, the authors, with a group of public health and informatics experts identified both functional and non-functional system requirements of the new ISS by visiting hospitals and meeting primary stakeholders. Then, the financial, technical, operational and ethical requirements were documented. In addition, the existing paper based data collection tool (TSR) was revised and a new tool (ISR) was created by removing redundant data elements and adding new ones. In the new ISS, the paper based data collection process begins at the time of admission and continues until the patient is discharged or dies. Subsequently, the patient's ICD-10 diagnosis codes and final disposition data become available. These data are then entered into the electronic application. The new application was developed using a distributed system architecture. A central server was located in the MoH and local servers were located in each hospital. Captured injury data were initially saved in the local server which synchronizes with the central server when internet connectivity becomes available.

Results

Piloting of the new ISS took place in March and April of 2013, at the Base Hospital, in Horana with data from 654 patients admitted with traumatic injuries. The new system addressed several deficiencies of the previous system (Table 1). Its distributed nature allowed restoring local databases from its mirror in the central server or vice versa; this is especially important to prevent losing data. Backing up data is paramount given the prevalence of power failures. In addition, the paper based tool enables continuous data collection during electricity or computer failures. We used open source software to decrease the initial costs and reduce dependency on proprietary technologies. Additionally, the new ISS was made flexible enough to incorporate or modify data elements as needed. Finally, the new application includes ICD-10 codes from chapters XIX and XX; this new information will enable improving injury prevention policy decisions.

Conclusions

Our testing showed that the new ISS provides a feasible and sustainable mean of injury surveillance in Sri Lanka. Settings with limited informatics resources can learn from our approach to overcome the deficiencies of a faulty ISS; A better ISS, might use available resources, open source software and accommodate changing data needs without incurring in major modifications.

Evolution of Injury Surveillance System (ISS) in Sri Lanka

Components of ISS	Characteristics	Previous ISS(2006)	New ISS(2013)
Paper based data collection tool	Name	Trauma Surveillance Record (TSR)	Injury Surveillance Record (ISR)
	Codes included	ICD 10 chapter XIX	ICD 10 chapter XIX & XX
Software Application	Version	1.0	2.0
	Technologies used	Proprietary (MS SQL Server, VB)	Open source (MySQL, PhP)
	Database	Standalone	Distributed
	Incorporate changing data needs	No	Yes
	Data back-up	No	Yes
	Validate data	No	Yes
	Handle missing information	No	Yes
	Generate flexible reports	No	Yes

Keywords

Injury Surveillance; Sri Lanka; Public Health

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