A Systematic Assessment of Injury Surveillance System of a State Hospital in Sri Lanka

Sampath UAA Perera, *Maleesha SMNS Mallawarachchi, Shiranee C Wickramasinghe
Ministry of Health, Colombo, Sri Lanka.

***Correspondence:** navodasandamali79@gmail.com

Received: Dec 03, 2020; Accepted: Jan 17, 2021

CITATION: Perera SUAA, Mallawarachchi MSMNS, Wickramasinghe SS. A Systematic Assessment of Injury Surveillance System of a State Hospital in Sri Lanka. Recent Adv Biol Med. 2021; 7(1): 1236029. https://doi.org/10.18639/RABM.2021.1236029

ABSTRACT
Injury surveillance is of critical importance in health care. Quality and timely surveillance data are required to evaluate the success and cost-effectiveness of strategies for injury prevention and management. The study was conducted in a state hospital in Sri Lanka with the aim of assessing the in-patient data components of the injury surveillance system. Focus Group Discussions, Key informant interviews, and review of secondary data from Bed Head Tickets and filled Injury Surveillance Forms were carried out. Content analysis was used to analyze qualitative data. Coverage and timeliness of injury surveillance were not satisfactory and there were gaps in the process of surveillance including a lack of room for utilizing gathered data at the institutional level.

KEYWORDS: Injury Surveillance System; Hospitals; Health Care.

1. INTRODUCTION

Disease surveillance is the ongoing systematic collection and analysis of data to gather information on a country's disease burden, population groups at risk, estimates of mortality, morbidity, risk factors, and determinants [1].

Injuries as leading public health and economic problem have an enormous impact on individuals and society [2]. Injury surveillance is of critical importance in understanding the circumstances leading to the injuries, planning their prevention via early warnings of new hazards and trends, conducting public awareness campaigns, and for safety legislation [3]. The reported number of hospitalizations due to traumatic injuries, the leading cause of admissions for the last two decades, was 1,130,084 in the year 2018 in Sri Lanka [4].

Effective injury prevention and management strategies are built upon a clear understanding of the extent of injuries. The systematic collection and use of data on risk factors, incidence, severity, outcomes, and costs assist in identifying populations at risk, implementing and evaluating prevention programs, and formulating and evaluating policy [5]. Quality and timely data are required to evaluate the evolving success and cost-effectiveness of strategies for injury prevention and management. Hence, injury surveillance lays the foundation for injury control initiatives.

Bedhead ticket is the medical record of hospitalized patients and the only source of information on inpatient morbidity and mortality data in Sri Lanka [6]. The information gathered through bed head tickets is transferred via web-based Indoor Morbidity and Mortality Return (e-IMMR) to the central level [7]. The National Injury Surveillance System (NISS) was introduced to selected state hospitals in Sri Lanka in 2016 owing to the fact that the e- IMMR did not provide the essential information required for injury prevention and management [8]. Ministry of Health formulated the policy and strategic framework on injury prevention which stated that one of the strategic objectives of the policy is to strengthen the injury information system [8]. The Initial phase of NIS included establishing a surveillance mechanism with feedback methodology. The circular and guidelines on NISS were issued in the same year describing responsibility and the flow of information and it was highlighted that Injury Surveillance Form (ISF) (H-1258) should be filled by a doctor and should be kept at each entry point of patient care. So, the injury surveillance system of Sri Lanka is fed with outpatient data, inpatient data and mortality data related to injuries. The ISF is filled for each patient presents to the hospital with injuries and data extracted from ISF is fed to the NISS.

The current study aimed to assess the in-patient data components of the injury surveillance system in a state hospital in Sri Lanka.

2. METHOD(S)

The study was conducted in Base Hospital Karawanella (BHK) in Sri Lanka which is a State Hospital in Kegalle District that consists of 362 beds with two units for all four major specialties. The current injury surveillance system has been introduced to BHK in 2016. The process of injury surveillance of the hospital was mapped.

Focus Group Discussions (FGDs) were conducted to identify the gaps in the process of injury surveillance with a mixed group which consisted of four doctors and four nursing Officers (NO) employed in the surgery unit of the hospital. A heterogeneous group was selected for the FGD to ensure inputs from a good mix of key people of the process of injury surveillance mechanism. Two rounds were performed using an FGD guide.

Eight Key Informant Interviews (KIIs) were conducted using a KII guide. Key informants were Regional Director of Health Services, Medical Officer (MO) for Non-Communicable Diseases (NCD) attached to Regional Directorate of Health Services (RDHS), Kegalle, Medical Superintendent (MS) of BHK, Consultant Surgeon, MO in charge of Out-Patients Department

(OPD), Matron, Medical Record Officer of Medical Statistics Unit (MSU) and Consultant Community Physician who is the focal point on injury surveillance.

Desk review of Bed Head Tickets (BHT) and ISF of patients with reported injuries discharged within the first five months of 2019 was carried out. The selection of duration of the study was to ensure capturing both festive and non-festive seasons of the year to avoid possible confounding factors associated including possible overburden of health workers with more occurrences of injuries in festive months. A Checklist to assess injury surveillance performance of the institution was developed as per the World Health Organization guidelines on injury surveillance [9]. The checklist was used to extract data from BHTs and ISFs in relation to coverage, completeness, accuracy, and timeliness of injury surveillance.

Coverage was defined as the percentage of admissions for which ISF was filled and attached to the BHT, out of the total number of admissions. Completeness was considered as the fact that all sections of ISF had been filled. The accuracy of each component of the ISF was assessed separately by comparing with the original data from relevant BHT and estimated as a percentage of total complete entries of each component. The entries to the system made within 30 days of discharge of the patient were taken in as timely.

Content analysis was used to analyze qualitative data. Ethical approval was obtained from the ethics committee of the Post Graduate Institute of Medicine, Colombo, Sri Lanka.

3. RESULTS

The process of injury surveillance of BHK was mapped and the identified gaps of each sub-stage were illustrated (Figure 1). It was revealed that only the doctor who attended to the admission of patients issued ISF. Still, the issuance of ISF did not happen regularly. It was noted that the admitting medical officers did not consider filling ISF as a compulsory task for them. It was evident that doctors were reluctant to fill the ISF as they felt that there were too many details to be filled in. The hospital had no facility for accessing the injury surveillance data once fed to the system which in turn prevent the possibility of utilizing the information or generating any report at the hospital level. Consultants were not involved in supervising injury surveillance at respective units. It was further revealed that BHK does not possess any institutional level feedback mechanism on the performance of injury surveillance. The coverage of injury surveillance from January 1st to May 31st in the year 2019 was 7.2% only (Table 1).

Table 1. Coverage of injury surveillance.

Month	Number of admissions with injuries	Number of admissions with injuries captured by surveillance	Coverage
January 2019	615	44	7.1%
February 2019	649	48	7.4%
March 2019	487	33	6.7%
April 2019	516	46	8.9%
May 2019	585	35	5.9%
Total	2852	206	7.2%

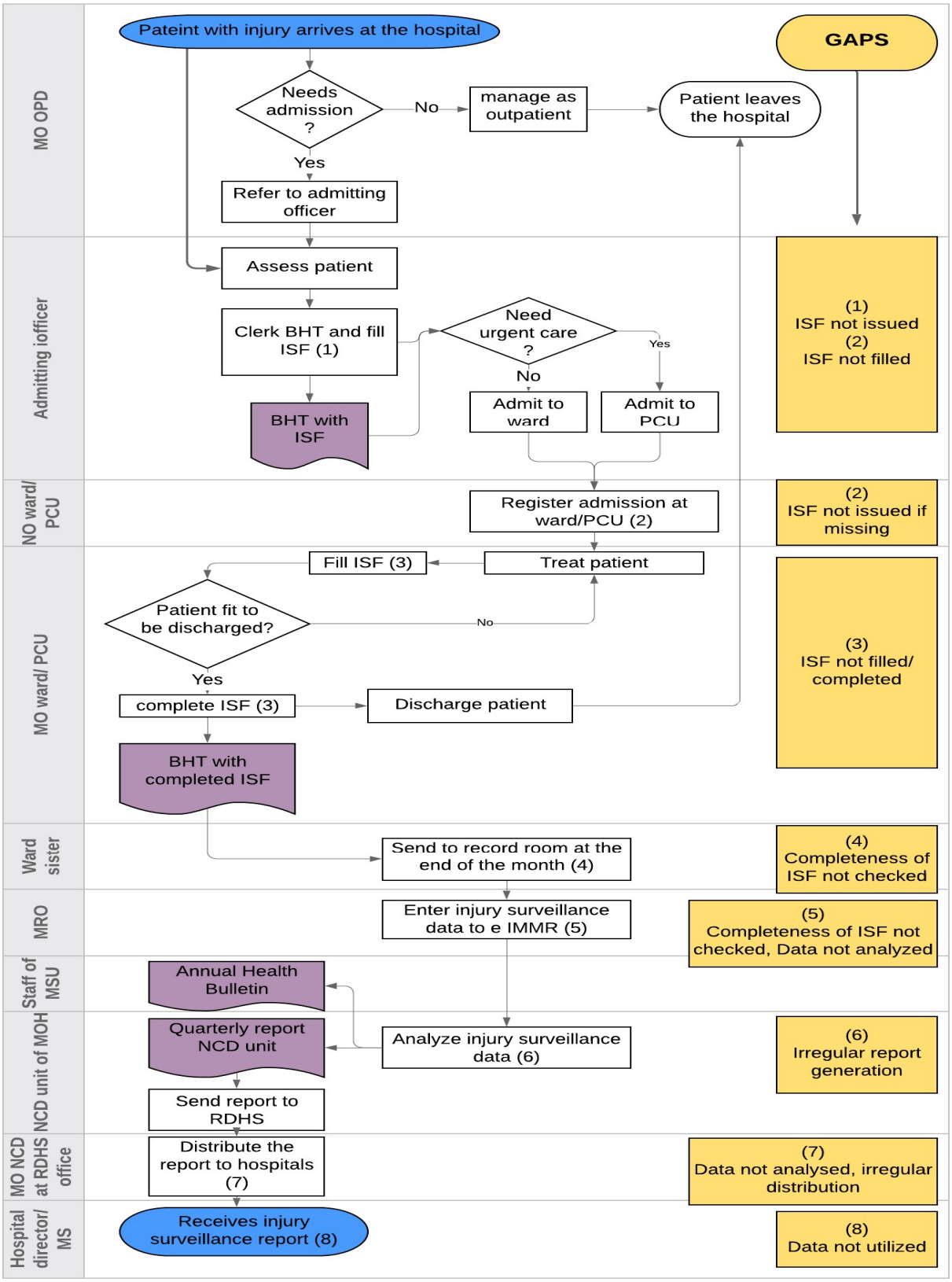
Only 11% of data related to patients with injuries (ISF) were entered within 30 days of patient discharge. Out of 16 items in ISF, Medical Officer of Health (MOH) division (25%), Nature of injury (62%) and Age (74 %) were the lowest reported completeness respectively. Accuracy with BHT data varied from 63.2 to 100%. The lowest percentages reported were Activity did at the injury, i.e., the course of action in which the person was engaged at the time of injury, (63.2%) and Time of injury (73.1%) (Table 2).

Table 2. Completeness and accuracy of filled injury surveillance forms.

Component of data	Percentage of forms having the relevant component of data	Percentage of forms with accurate data
Date of Injury	95.1%	84.8%
Time of injury	62.0%	73.1%
Age	73.9%	95.2%
Sex	73.9%	100.0%
MOH Division	25.0%	Not assessed*
Mechanism of injury	97.8%	84.9%
Place of occurrence of injury	88.0%	76.2%
Activity done time of injury**	88.0%	63.2%
Intent (intentional or not)	92.9%	100.0%
Affected body region	92.9%	97.7%
Nature of injury	84.8%	90.0%
Evidence of alcohol use	97.8%	88.1%
Disability at the time of discharge	94.0%	80.2%
Evidence of substance use	89.1%	95.3%
Patients outcome	85.9%	91.7%
Tertiary care given	79.9%	100.0%

*MOH division was not included in the analysis as none of the BHTs had that information.
**The activity in which the person was engaged at the time of injury.

Figure 1. Process of injury surveillance at BHK and the gaps identified.



PCU - Preliminary Care Unit

4. DISCUSSION

Determining an appropriate balance between adequate detail and simplicity of the data collection process is always a challenge for any surveillance system [10]. It was noted in the current study that ISF was issued at only one point that is by the admitting medical officer which had a considerable negative influence on the availability of the same. In Canadian Hospitals' injury surveillance system, the attending physician or another staff member could add clinical data to the injury surveillance form, and data coders would extract other information found in patients' narratives [3].

Lack of issuing and completion of ISF, delay in entering data to the e-IMMR, and absence of feedback mechanisms and facilities to analyze data at the institutional level were identified as deficiencies in the existing process. Similarly, weakness in data capture and usage including data collection, data recording, and data dissemination has been recognized as a barrier to implementing injury surveillance systems in Iran [11].

As per the guidelines of the World Health Organization, it has been emphasized that coverage of an injury needs to be over 80% for effective decision making (WHO, 2001). It was revealed that coverage of patients with injury and timeliness were unsatisfactory. Coverage of injury surveillance was as low as 7.2%.

It was noted that facts which are more dependent on the details provided by the patient or bystander, namely, the activity in which the person had been engaged in the time of occurrence of the injury and the time of the event, were reported least, which signifies gaps in proper history taking.

The completeness of injury registration for primary prevention in a provincial Russian region with respect to the coverage of cases treated at the Shenkursk central district hospital was reported to be 86% (12) the success of which could at least partly be attributed to the well-planned information flow. Series of previous studies have shown that injury surveillance information systems can be beneficial through providing timely and accurate data [11,13].

Timeliness of surveillance was suboptimal with 11% of the entries made within 30 days of discharge of the patient. However, even some developed countries have failed to achieve the timeliness of injury surveillance [14].

Qualitative interviews revealed that lack of awareness, skills, and interest of the staff, poor supervision, and resource constraints contributed to unsatisfactory performance injury surveillance. In contexts such as Myanmar and Cambodia, similar causes resulted in poor coverage and performance of injury surveillance systems [15]. Awareness and knowledge of the staff on the importance and process of surveillance while providing adequate facilities such as uninterrupted internet facility and clear assignment of responsibilities for each staff category are important factors.

It has been emphasized that any surveillance system should facilitate data analysis and utilization at each level in local planning which enhances motivation and ownership of the system. It is also indicated a strengthening of the linkage from data to action at each level [16]. Quite contrastively, the current study revealed that there were no facilities to access the data at the hospital or regional level which hinders the use of any data at the hospital leading to the absence of data analysis and reporting feedback to relevant wards.

WHO stepwise process to surveillance [16] emphasized that only a few important data must be included in routine surveillance to ensure the quality of data but current ISF was revealed to be lengthy with too many details. The responsibility of documentation being with the doctors also identified as a barrier in ensuring the efficiency of the surveillance system. The issue is starkly contrasted with the fact that the doctors were not given any special in-service training on the subject.

Poor monitoring and coordination were identified as a major gap. Appointing liaison nursing officers at wards which is a well-known strategy in other fields such as infection control in Sri Lanka contributed to improving coordination of this system.

5. CONCLUSION

Coverage of capturing patients (7.2%) and timeliness of data entry to the system (11%) was below the expected level (80%) at BHK. The completeness and accuracy of some ISF data which were below average indicated room for improvement. Gaps that affected injury surveillance negatively were lack of capacity building, unavailability of access to hospital data in the e-IMMR system, poor feedback mechanism, poor utilization of data, disagreement of staff on issuing and filling the ISF, and unavailability of a monitoring mechanism.

AUTHOR CONTRIBUTIONS

Concept, developing methodology, and data collection were carried out by UAAS Perera. Data analysis and documentation was done by SMNSM Mallawarachchi. Overall supervision of the research was done by SC Wickramasinghe.

CONFLICT OF INTEREST

There is no conflict of interest.

REFERENCES

1. World Health Organization. Public health surveillance [Internet]. 2020. https://www.who.int/immunization/monitoring_surveillance/burden/vpd/en/#:~:text=An%20ongoing%2C%20systematic%20collection%2C%20analysis,disease%20prevention%20and%20control%20measures
2. Runge JW. The cost of injury. Emerg Med Clin North Am. 1993; 11(1):241–53.
3. Crain J, McFaull S, Thompson W, Skinner R, Do MT, Fréchette M, *et al*. Status report - The Canadian hospitals injury reporting and prevention program: a dynamic and innovative injury surveillance system. Health Promot Chronic Dis Prev Can Res Policy Pract. 2016; 36(6):112–7.
4. Medical Statistics Unit, Ministry of Health and Indigenous Medical Services. Annual Health Statistics 2018 Sri Lanka [Internet]. 2020. Available from: http://www.health.gov.lk/moh_final/english/public/elfinder/files/publications/AHB/2020/Final%20AHS%202018.pdf

5. Horan JM. Injury surveillance. Epidemiol Rev. 2003; 25(1):24–42.
6. Mallawarachchi SMNSM, Mallawarachchi CH. Knowledge and practices of nursing officers regarding medical record keeping in a government hospital, Sri Lanka. J Health Syst Policies. 2020; 2(2):137–48.
7. Kariyawasam NC, Weerasekera VS, Dayaratne MKDRB, Hewapathirana R, Karunapema RPP, Bandara IR. eIMMR: the future of health statistics in Sri Lanka. Sri Lanka J Bio-Med Inform. 2011; 1(0):14.
8. Ministry of Health Nutrition and Indigenous Medicine, Sri Lanka. General Circular No: 01-26/2016 National Injury Surveillance (NIS) System. 2016.
9. Holder I, World Health Organization (WHO), Center for Disease Control. Injury surveillance guidelines. Atlanta, Ga.: World Health Organization; 2004.
10. Wainiqolo I, Kafoa B, McCaig E, Kool B, McIntyre R, Ameratunga S. Development and piloting of the Fiji injury surveillance in hospitals system (TRIP Project-1). Injury. 2013; 44(1):126–31.
11. Azadi T, Khorasani-Zavareh D, Sadoughi F. Barriers and facilitators of implementing child injury surveillance system. Chin J Traumatol. 2019; 22(4):228–32.
12. Unguryanu TN, Grjibovski AM, Trovik TA, Ytterstad B, Kudryavtsev AV. Injury registration for primary prevention in a provincial Russian region: setting up a new trauma registry. Scand J Trauma Resusc Emerg Med. 2019; 27(1):47.
13. Fitzharris M, Yu J, Hammond N, Taylor C, Wu Y, Finfer S, *et al*. Injury in China: a systematic review of injury surveillance studies conducted in Chinese hospital emergency departments. BMC Emerg Med. 2011; 11(1):18.
14. Stone DH, Morrison A, Smith GS. Emergency department injury surveillance systems: the best use of limited resources? Inj Prev. 1999; 5(3):166–7.
15. World Health Organization. Profile of injury surveillance systems in selected Member States of the Asia-Pacific region [Internet]. 2012. Available from: https://apps.who.int/iris/handle/10665/205661
16. Riley L, Guthold R, Cowan M, Savin S, Bhatti L, Armstrong T, *et al*. The World Health Organization STEPwise approach to noncommunicable disease risk-factor surveillance: methods, challenges, and opportunities. Am J Public Health. 2016; 106(1):74–8.