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The Value of Hospital Data

Understanding and Preventing Intentional Injury in Liberia

By Lucie Collinson, Andrew Winnington, and Mary Vriniotis

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About International Physicians for the Prevention of Nuclear War

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For more information, please visit http://www.ippnw.org.

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List of abbreviations

ED	Emergency department
ID	Identity
IPPNW	International Physicians for the Prevention of Nuclear War
LAVO	Liberian Armed Violence Observatory
MDG	Millennium Development Goal
WHO	World Health Organization

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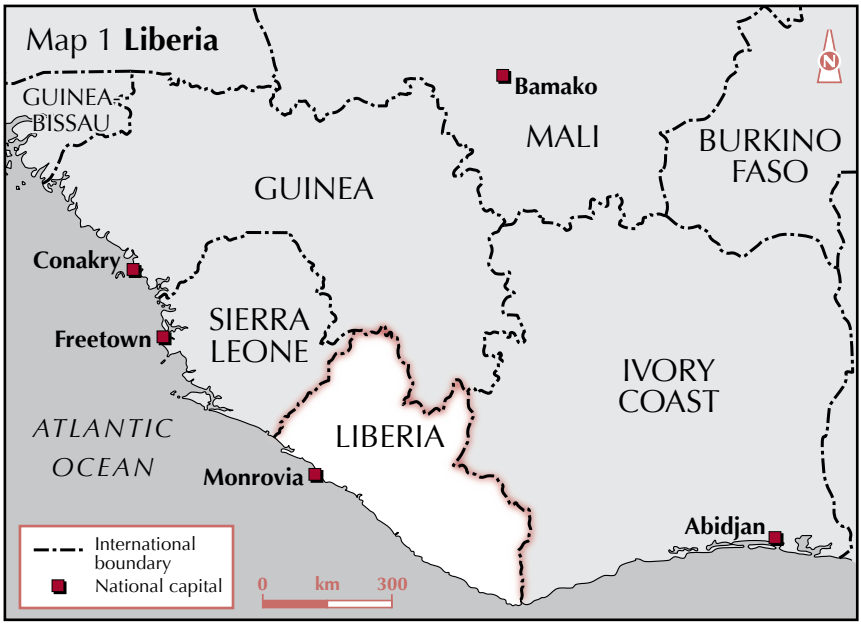
In memory of
Br. Patrick Nshamdze
and all of the health professionals
who passed away
while caring for patients
during the Ebola outbreak.


Map 1 Liberia
GUINEA-BISSAU
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GUINEA
Conakry
Freetown
SIERRA LEONE
IVORY COAST
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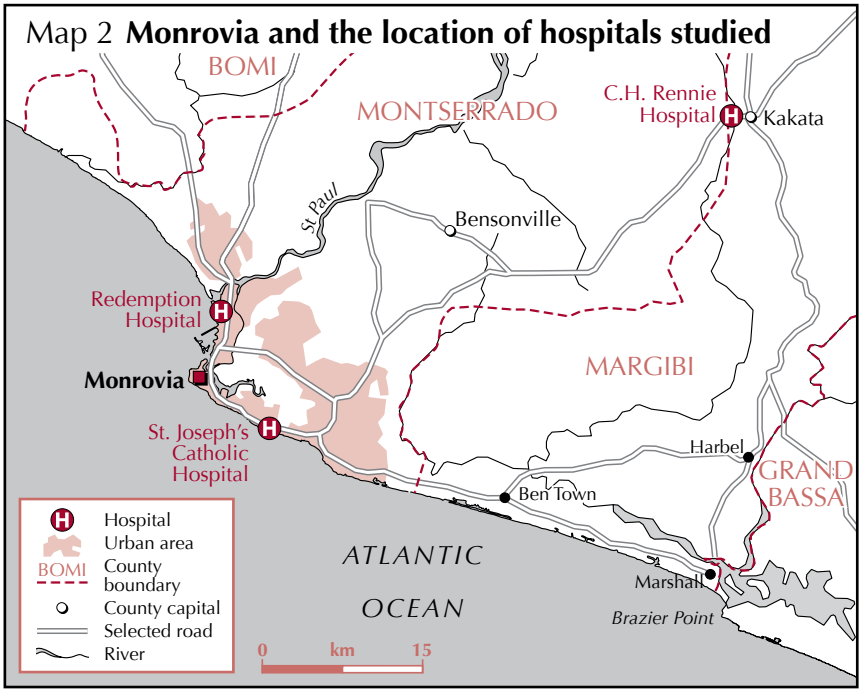
LIBERIA
Monrovia
Abidjan
International boundary
National capital
0 km 300


Map 2 Monrovia and the location of hospitals studied
BOMI
MONTSERRADO
C.H. Rennie Hospital
Kakata
St Paul
Bensonville
Redemption Hospital
Monrovia
MARGIBI
St. Joseph's Catholic Hospital
Harbel
GRAND BASSA
Ben Town
ATLANTIC OCEAN
Marshall
Brazier Point
Hospital
Urban area
BOMI County boundary
County capital
Selected road
River
0 km 15

Introduction

Studying the evidence related to the burden of injury of a population is a critical component of developing strategies to prevent and reduce violence. In many countries around the world, national observatories have been established to collect data to measure and monitor armed violence in an effort to inform and strengthen evidence-based armed violence reduction initiatives. These observatories collect data on violent incidents to enhance awareness of the extent and distribution of armed violence in varying geographic and socio-economic settings. An observatory's ability to inform effective violence prevention strategies depends in large part on the efficient collection and timely sharing of quality data (Gilgen and Tracey, 2011).

High levels of violence have characterized Liberia's post-conflict transition. In 2011, the Liberian Armed Violence Observatory (LAVO) was established as an independent institution designed to gather, analyse, and produce reports on armed violence data in Liberia. LAVO receives data from diverse sources. While most of the data comes from Liberian police records, the Liberian Ministry of Health and Social Welfare supplies emergency department (ED) data from three hospitals (LAVO, 2011; 2012). The two Liberian hospitals referred to throughout this study are both in the capital city, Monrovia: Redemption Hospital (hereafter 'Redemption'), the largest public hospital in the country, lies in the north of Monrovia, in New Kru Town; and St. Joseph's Catholic Hospital (hereafter 'St. Joseph's'), a large private hospital, lies in the south of Monrovia, in Congo Town (see Map 2 and 'Monrovia hospital profiles'). Because terms for records and files used differ in name and nuance among hospitals, the terms used in this study are listed in the Glossary.

Concerns have been raised by academics about relying largely on police data to assess the prevalence of violence, including armed violence (Shepherd and Sivarajasingam, 2005, pp. 324–25). As this Working Paper demonstrates, LAVO's access to quality data from hospitals enhances its ability to produce more comprehensive analysis and reporting on armed violence. To date,

however, the majority of Liberian hospitals are not supplying LAVO with data; more complete hospital data would allow the observatory to improve the accuracy of its assessments on the burden of violent injury and of its tracking of current and emerging trends.

A comparison of sources regularly used by LAVO and data collected from hospital medical records by the authors of this paper reveals significant discrepancies. For example, in assessing the gender of victims of interpersonal injuries (physical injuries committed intentionally, by one person against another), records at St. Joseph's show that in 2011, 56.8 per cent of such victims were women. In sharp contrast, LAVO's data from media and police reports shows that only 26.7 per cent of victims of interpersonal injuries were women (see Table 21). These proportions are not directly comparable, however, as LAVO collects data only on interpersonal injuries due to armed violence by any kind of weapon (including, for example, firearms, bladed weapons, blunt objects), whereas the authors also included hospital records relating to injuries caused without weapons.

This difference suggests that the use of more detailed hospital records and the inclusion of injuries that do not involve weapons will improve LAVO's ability to capture rates of interpersonal injuries among women. Similarly, it is important for LAVO to gather more detailed data on the perpetrators of interpersonal injuries, not least to enhance the identification of risk factors and the design of violence prevention strategies.

This Working Paper provides an examination of hospital records and discusses the policy implications of retrospective audits of records from two hospitals in Monrovia so as to: 1) investigate the prevalence of injuries presenting to hospitals, particularly interpersonal injuries, including those from armed violence, and 2) compare and contrast the quantity and quality of data collected from the Monrovian hospital audit with data being provided to LAVO from the same hospitals and from other sources. The Paper concludes with steps that LAVO and Liberian hospitals can take to improve the collection and dissemination of data on intentional injuries (that is, injuries which are not a result of accidents), with the aim of improving LAVO's ability to inform policies designed to reduce armed violence in Liberia.

The Liberian context

From December 1989 to August 2003, Liberia's civil conflict claimed a total of 150,000–250,000 lives and displaced nearly one and a half million people (AOAV, n.d.). The conflict left the country in economic ruin and with high availability of weapons (BBC, 2015). The Accra Peace Agreement, signed in 2003, marked the end of hostilities; thereafter, a transitional government made up of the Economic Community of West African States and the United Nations Mission in Liberia steered the country towards elections in 2005. The disarmament, demobilization, rehabilitation, and reintegration programme initiated in 2004 officially disarmed more than 100,000 people (ACCD, n.d., p. 6). In November 2005, in the first elections since the end of the civil war, Ellen Johnson-Sirleaf was elected president and thus became Africa's first female head of state. The UN peacekeeping force, once numbering as many as 15,000, dropped down to about 6,300 by May 2014 (UNMIL, n.d.).

Despite a comprehensive UN disarmament programme and the deployment of military police, armed violence in Liberia has had a lingering impact (UNDP, n.d.). Psychopathology persists in Liberia, with high rates of post-traumatic stress disorder and major depressive disorder, particularly among former combatants with head injuries and traumatic brain injuries (Galea et al., 2010, p. 1745; Johnson et al., 2008, p. 676; 2012, p. 531). High levels of interpersonal violence, including criminal and sexual violence, persist (Allen and Devitt, 2012; Tayler-Smith et al., 2012; Vinck and Pham, 2013). Research conducted by the Small Arms Survey and Action on Armed Violence in 2010 indicates that nearly one in four households in Monrovia reported that a family member had been the victim of a violent encounter in the year prior to the survey (mainly armed robberies at home) (Fuerth, 2011, p. 2). A significant number of the victims (44 per cent) were physically injured as a result of the crime or violent encounter (p. 12).

Persistent armed violence is one of the greatest obstacles to achieving the Millennium Development Goals (MDGs) in Liberia by 2015 (Denney, 2012, pp. 3–4). In its *World Development Report 2011*, the World Bank asserts that 'no low-income fragile or conflict-affected country has yet to achieve a single United Nations Millennium Development Goal' (World Bank, 2011, p. 1). In 2007, 64 per cent of the Liberian population was living below the national poverty line or on less than USD 1 per day (GoL, 2008, p. 10). In 2013, according to the Liberia Demographics and Health Survey, the maternal mortality rate was very high, at 1,072 deaths per 100,000 live births, and the infant mortality rate stood at 54 deaths per 100,000 live births (LISGIS et al., 2014, p. xxiii). In 2001–02, illiteracy was at 65 per cent for 15–24-year-olds, who suffered from an unemployment rate of up to 88 per cent in 2000 (GoL, 2008, pp. 11–17).

The Liberian government has committed to reducing and preventing armed violence to eliminate poverty and make progress towards the MDGs, as demonstrated by its adoption of the Geneva Declaration on Armed Violence and Development in 2006. Endorsed by more than 100 states, this declaration is the strongest political statement to date addressing the impact of armed violence within a development context. In 2010, the Liberian government endorsed the Oslo Commitments on Armed Violence, thereby agreeing to make measurable reductions in armed violence by 2015. The country ratified the international Arms Trade Treaty in April 2015, which entered into force globally in December 2014 and at this writing has 130 signatories and 78 States Parties.

For Liberia, the means of fulfilling the Oslo Commitments involve the ability to quantify the level of armed violence throughout the country and to identify risk factors so as to be able to advise policy-makers. In this process, two aspects are key: the acquisition of quality hospital-based violent injury and death data, as it can enhance violence-tracking processes, and the recording of the contextual details of injuries in order to inform violence prevention strategies from a public health perspective. Making progress in this area became much more challenging in 2014 due to the Ebola crisis in

Liberia. This outbreak prioritized and focused medical community efforts on life-saving measures and disease prevention. Measures taken by authorities to contain Ebola, including restrictions on travel, have stimulated new violence as fears grew (AFP, 2014). Redemption has opened an Ebola Survivors Clinic; the data collected at the clinic serves as an indicator of trust from the community (WHO, 2015).

Violence as a public health problem

Armed violence is a preventable cause of widespread injury and suffering and thus a fundamental public health issue, one recognized by the World Health Organization (WHO) as a leading worldwide public health problem whose prevention requires a multi-sectoral approach (WHO, 2007).

Armed violence has devastating effects on health, security, and sustainable social and economic development. The WHO's publication *Small Arms and Global Health* assesses its impact on families, communities, and societies, including in terms of long-term physical and mental disabilities, the disruption of livelihoods and education, and the erosion of social networks within communities (WHO, 2001).

The World Health Assembly—the decision-making body of the WHO—declared violence a major public health issue in 1996 (Krug et al., 2002). In more recent years, while the global incidence of armed conflict has declined, the number of people killed by armed violence has not. Indeed, 'more than 740,000 men, women, and children die each year as a result of armed violence. The majority of these deaths—490,000—occur in countries that are not affected by armed conflicts' (Geneva Declaration Secretariat, n.d.). An estimated nine out of ten deaths occur in non-conflict settings (Gilgen, 2012; Geneva Declaration Secretariat, 2011, p. 44).

The Liberian Armed Violence Observatory

Established in March 2011, the independent Liberian Armed Violence Observatory informs 25 government and non-government stakeholders in Liberia, including the Ministry of Health and Social Welfare (see Table 1). It collects and analyses data to generate reports on armed violence in the country, which it distributes to the stakeholders and makes publicly available online. To date, LAVO has produced two reports on armed violence in Liberia, in December 2011 and July 2012 (AOAV, n.d.). The British non-governmental organization Action on Armed Violence (previously known as Landmine Action), which is based in Monrovia, administered the establishment of LAVO.

The Observatory works directly in line with the second pillar of the Geneva Declaration on Armed Violence and Development, which emphasizes monitoring to improve awareness of the scope and scale of armed violence and its negative impact on development (LAVO, 2012). All of LAVO's stakeholders have a vested interest in having access to regular, quality comprehensive data, yet greater institutional investment is needed to enhance the country's ability to gather hospital-based injury data. The more the stakeholders appreciate the value of such hospital data, the more likely they are to make the necessary investments.

The following providers agreed to supply LAVO with armed violence data for use in armed violence assessments (LAVO, 2012, p. 4):

- the Liberian National Police;
- the United Nations Police (United Nations Mission in Liberia);
- the Ministry of Health and Social Welfare, submits data from hospitals;
- the Liberia Early-Warning and Response Network; and
- the Liberian media.

Table 1 **LAVO stakeholders**

Type of stakeholder	Name of entity
National agencies	Liberia Institute of Statistics and Geo-Information Services Liberia National Commission on Small Arms Liberian National Police Ministry of Gender and Development Ministry of Health and Social Welfare Ministry of Internal Affairs Ministry of Justice Ministry of National Defence Ministry of State
International organizations	United Nations Development Programme United Nations Mission in Liberia World Health Organization
Non-governmental organizations	Action on Armed Violence Action Aid Liberia Kofi Annan Institute for Conflict Transformation Liberia Action Network on Small Arms Liberia National Red Cross Society Peace Interaction Network West Africa Network for Peacebuilding Youth Crime Watch
Media	*Inquirer* *New Democrat* Press Union of Liberia
Observers	Liberia National Bar Association Supreme Court of Liberia

Source: LAVO (2012, p. 2)

LAVO receives roughly 85 per cent of its data from police sources: 63 per cent from the Liberian National Police and 22 per cent from the UN Police; in contrast, hospital data comprises only 11 per cent of the total data. LAVO draws the remaining 4 per cent of its total data from media reports (LAVO, 2012, p. 4).

The role of hospital injury data

Research conducted for this Working Paper indicates that LAVO is not receiving all of the available hospital injury data. This section considers not only the benefits of and challenges inherent in gathering such hospital data, but also their implications for LAVO's ability to collate and provide comprehensive assessments.

International evidence reveals inconsistencies between assault-related injury data from emergency departments and from the police (Sutherland, Sivarajasingam, and Shepherd, 2002). For example, a study conducted in Wales finds that 65.6 per cent of assault-related injuries during a six-month period were recorded only by emergency departments, whereas 23.6 per cent were recorded only by the police; a mere 10.8 per cent were recorded by both the emergency departments and the police (Sutherland, Sivarajasingam, and Shepherd, 2002, p. 246).

In addition, studies from Australia, France, and the United Kingdom show that relying on police data alone for road traffic crash injury data can result in underestimates of the related burden of injury (Cryer et al., 2001; Amoros et al., 2008; Rosman and Knuiman, 1994).

Research in France and Pakistan has shown the capture–recapture method to be useful in detecting discrepancies between data sets (Amoros et al., 2008; Aptel et al., 1999; Razzak and Luby, 1998). The capture–recapture method is used in epidemiology to 'estimate or adjust for the extent of incomplete ascertainment using information from overlapping lists of cases derived from distinct sources' (Corrao et al., 2000). It merges information from several sources to determine the real number of cases in the population and the exhaustiveness of each source (Aptel et al., 1999).

In many countries, assaults that lead to injury may not be reported to, or recorded by, the police (Shepherd and Sivarajasingam, 2005; Warburton

and Shepherd, 2004; Rosman and Knuiman, 1994). One explanation is that police records are a product of police activity, which responds to reporting; such records are not necessarily a reliable measure of violence based on the actual experience of victims (Shepherd and Sivarajasingam, 2005). Quality hospital data can thus serve to complement police records on armed violence, particularly as it tends to capture information on victims who do not report incidents to the police. In Liberia, underreporting is indeed an issue, as a Small Arms Survey report highlights:

> *The incidence of violent acts, as measured by the LNP [Liberian National Police], is one of the most widely publicized yardsticks by which the Government of Liberia gauges its own progress towards stability. Yet LNP data is prone to a number of deficiencies. For one, it is vulnerable to bias as a result of underreporting on the part of victims, especially in cases of domestic violence. If people do not trust the police, they are unlikely to report the crime. […] As a result, police data is not generally representative of a particular population or a particular crime* (Gilgen and Murray, 2011, p. 3).

Liberian hospital files—such as ED attendance records, hospital outpatient clinic records and inpatient notes—can provide a significant amount of injury and violence-related data that is critical to injury surveillance and to the development of evidence-based interventions. Hospitals can also provide information regarding levels of violence in communities, such as data from rape victims' clinics, which can provide indicators of violence against women, and morgue data, which contains demographic information and details on causes of death.

The Liberian Ministry of Health and Social Welfare, which oversees the management of hospital data, provides LAVO with ED data from three hospitals in Liberia (see Map 2):

- St. Joseph's Catholic Hospital, a large private hospital in Monrovia;
- Redemption Hospital, the largest public hospital in Monrovia; and
- C.H. Rennie Hospital, a small rural hospital in Kakata, Margibi county (LAVO, 2012, p. 2).

For reasons that remain unclear to the authors, neither the John F. Kennedy Memorial Medical Centre—the main referral hospital in Monrovia—nor any of the other hospitals in Liberia provide data to LAVO.

Challenges to collecting hospital data in Liberia

In order to quantify the levels of violent injuries presenting to hospitals in Liberia, the authors conducted a retrospective audit of records from the two major hospitals that supply data to LAVO: Redemption and St. Joseph's. The hospitals maintain a range of patient records, including attendance registers, admissions registers, patient files, and monthly attendance records (see Glossary). Neither hospital systematically records the causes of injuries, thus limiting the availability of data for collection (Dziewanski, 2011).

The quality and comprehensiveness of the different hospital records varies dramatically. Because different hospitals employ different types of records, at times different names are used for the same types of records, which can make comparing cross-institutional records challenging (see Glossary). The patient files contain much more information than the attendance or admissions registers, including significantly more details on the context of injuries and on perpetrators. This information is vital to designing injury prevention strategies, but data supplied to LAVO is primarily from attendance registers, the least complete of the available sources.

Interpersonal injury data—such as details on weapons used and perpetrators—is not being collected routinely or systematically in the medical records of Liberian hospitals. Although clinical staff in emergency departments may be recording incidents as 'assaults', medical records officers are not always entering them as such in the registers. The audit found that patient files documented significantly more details about each injury than the medical attendance registers; at Redemption, for instance, the patient files recorded the intentionality of an injury much more often than the registers (see Table 10). Furthermore, the audit revealed 248 additional injuries, 212 of which were interpersonal (see Table 3). This finding indicates that LAVO misses a large quantity of armed violence data by collecting data from ED attendance registers rather than the more comprehensive patient files.

In 2007, the federation International Physicians for Prevention of Nuclear War (IPPNW) conducted a multi-centre pilot research study in city hospitals in five African countries to document the challenges to hospital data collection. Those challenges included a lack of institutional commitment to data collection on violent injuries, competition for human and financial resources to conduct research, and insufficient awareness of the importance of the data to public health initiatives (Zavala et al., 2007).

Monrovia hospital profiles

Redemption is located in the borough of New Kru Town and is the second-largest public hospital in Monrovia, with a capacity of 85 beds and providing 24-hour care for hundreds of patients on a daily basis (Johnson, 2012). It has both adult and paediatric wards, including neonatal care, obstetrics, and gynaecology. As the largest free hospital in Monrovia, Redemption has taken on roles as the city's safety net and a source for health education (see Photos 1A–C). It is the second-largest referral hospital in the country, after the John F. Kennedy Memorial Medical Centre. Redemption offers free health care and has a confidential rape victims' clinic.[1]

Photo 1A Notices by the entrance of Redemption, Monrovia, August 2012.
Source: Lucie Collinson

Photo 1B Notices by the entrance of Redemption, Monrovia, August 2012.
Source: Lucie Collinson

St. Joseph's is located in Congo Town in Monrovia. It is a private hospital with a capacity of 141 beds, including internal medicine, paediatrics (eight beds), surgery, and obstetrics and gynaecology (SJCH, n.d.). The hospital admits and treats more than 3,000 patients per year, also providing 24-hour care. It employs 205 staff, including nine medical doctors as well as senior and general staff (Kanneh, 2013). Hospital patients have to pay charges unless they have health insurance, as is the case for embassy staff. The number of patients tends to decrease towards the end of the month, as monthly salaries run low, and during public and school holidays, as parents prefer to treat their children at home to save money for school fees.[2] The hospital receives minimal subsidies from the Liberian government (Kanneh, 2013); it relies predominantly on international donations and revenue from patients.

Both Redemption and St. Joseph's keep records from the moment a patient presents in the emergency room or is admitted for a medical procedure until the patient is discharged. The record-keeping is conducted by various hospital personnel. For example, a number of medical records officers enter data into the hospital attendance registers (from the emergency department)

Photo 1C Notices by the entrance of Redemption, Monrovia, August 2012.
Source: Lucie Collinson

at both hospitals. Each hospital uses internally inconsistent terminology, abbreviations, and classifications for different illnesses and injuries.

Officers use local terms such as 'battle syndrome' for domestic violence, 'cutlass' for machete, and 'criminal abortion' for non-clinical abortion. They occasionally recorded additional information, such as treatment costs, deaths, cases of absconding, and transfers. The authors did not systematically record criminal abortions, epistaxis (nosebleeds), or vaginal bleeding in the audit, unless these had been specified as injuries.

Research methods

The authors conducted retrospective audits of ED records, attendance registers, and inpatient records for injured patients at Redemption and St. Joseph's. An initial audit was conducted at Redemption from 12 to 24 September 2011, and a further audit took place at both hospitals from 10 to 22 August 2012.

In view of the incomplete nature of hospital medical records, the authors randomly selected and reviewed Redemption records dating from 2004 to 2012 and St. Joseph's records dating from 2011 to 2012. Individual records were audited for trauma and injury-related entries, regardless of whether these were intentional or non-intentional. At St. Joseph's, injury data was collected from four different hospital sources: attendance registers, admissions registers, patient files, and monthly attendance records.

This study makes use of the definition of 'injury' that appears in the WHO's *Injury Surveillance Guidelines:* 'the physical damage that results when a human body is suddenly or briefly subjected to intolerable levels of energy' (Holder et al., 2001, p. 5; see Glossary). The energy that causes an injury may be mechanical, such as the impact with a moving or stationary object, including a surface, knife, or vehicle; radiant, such as blinding light or a shock wave from an explosion; thermal, such as air or water that is too hot or too cold;

Photos 2A–B Redemption attendance register. Source: Andrew Winnington

electrical; or chemical, such as a poison or an intoxicating or mind-altering substance, including alcohol or a drug (p. 5). Injury attendance data was manually recorded based on information in registers (see Photos 2A and 2B) and patient files (see Photos 3 and 4), which were obtained from the medical records officers.

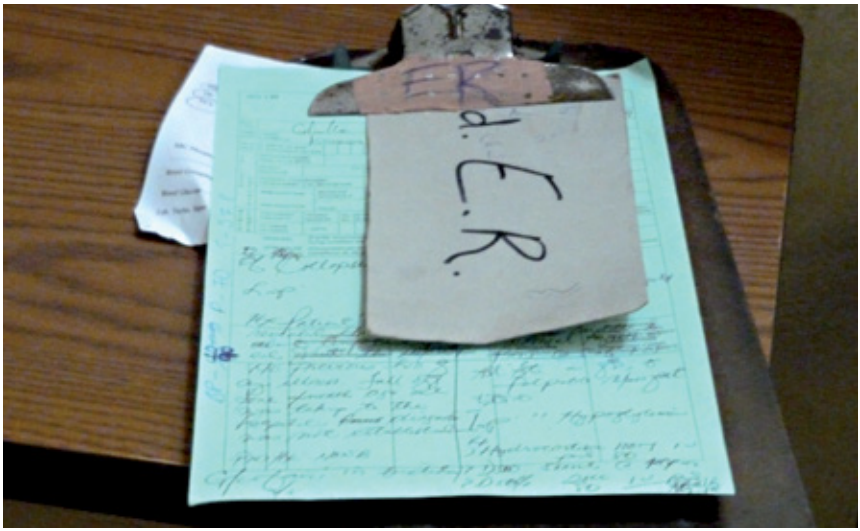


Photo 3 Patient file at Redemption. Source: Andrew Winnington

At Redemption, the authors collected data from the following sources:

- ED attendance registers, which contain information such as the date of attendance; the patient's sex, age, and injury; and a patient identity (ID) number, assigned by the hospital at admission;
- admissions registers, which list the date of admission and length of stay as an inpatient; the patient's sex, age, and type of injury; and the patient ID number assigned by the hospital;
- patient files or inpatient notes, which include the date of admission; the patient's sex and age; the patient ID; details on the injury, such as its anatomical location, severity, and intentionality; the type of weapon used to inflict the injury, if applicable; and information about the incident, such

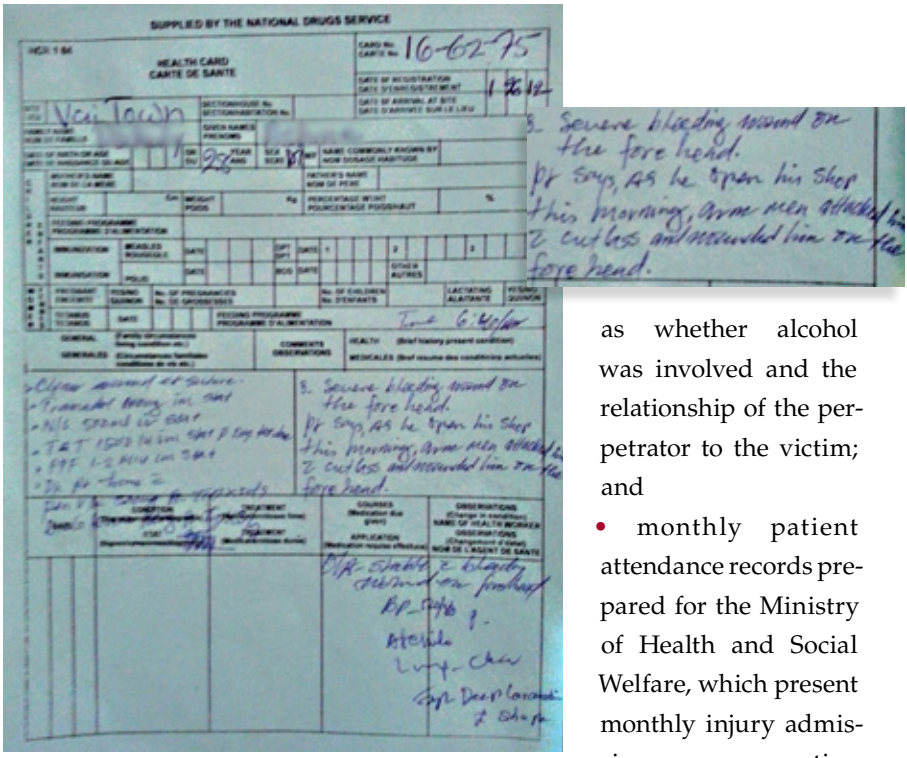


Photo 4 Close-up of patient file at Redemption (anonymized). Source: Andrew Winnington

as whether alcohol was involved and the relationship of the perpetrator to the victim; and

- monthly patient attendance records prepared for the Ministry of Health and Social Welfare, which present monthly injury admissions as a proportion of hospital admissions.

Victims of sexual assault at Redemption were treated in a separate clinic, which did not provide access to its records; however, the authors were able to collect related data from the monthly patient attendance records.

Redemption ED attendance registers and inpatient admissions registers were often incomplete and frequently lacked front or back pages. A number of the sizeable monthly registers could not be located at all. Moreover, under 'date(s) of attendance', the registers listed the date of data entry rather than the date the patient attended the hospital, which could predate the data entry by weeks. The incomplete nature of the data precluded the generation of a complete picture for the years 2004–12; instead, the authors produced sub-samples for the periods 2003–06 and 2009–12.

Similarly, at St. Joseph's, the incomplete nature of the inpatient admissions registers prompted the authors to take a random sample of monthly patient files dating from the period 2011–12. More than 90 per cent of the cases selected for patient file assessment were accessible for review. The authors collected data from the following sources:

- ED attendance patient notes, which contain information such as the date and time of attendance (details as to whether they were admitted); the patient's sex, age, occupation, and location of incident; diagnoses, treatment, test results, imaging, and associated costs; and information about the injury, such as its anatomical location, intentionality, and the means of injury; perpetrator details; and follow-up needed or investigations;
- admissions registers, which list the date of admission and length of stay as an inpatient; the patient's sex and age; and diagnoses as well as the means of injury, if applicable;
- admitted patient files, which include the dates of admission and discharge; the patient's sex, age, occupation, and location of incident; diagnoses, treatment, test results, imaging, and associated costs; information about the injury, such as its anatomical location, intentionality, and the circumstances and means of injury; and perpetrator details; and
- monthly patient attendance records prepared for the Ministry of Health and Social Welfare, which provide the monthly injury admissions as a proportion of hospital admissions and outpatient attendance.

Patient files from St. Joseph's provided costing information regarding treatment, the number of procedures and medication, and the length of stay, although such details were not available for every patient.

To ensure confidentiality and anonymity of the study population, the authors did not record any names or addresses from any of the hospital records.

Findings from Redemption

All reviewed data sources indicate that the majority of injuries presenting to Redemption were non-transport-related: 78.9 per cent according to the ED attendance registers for the period 2003–06 and 65.8 per cent based on the ED attendance registers for the period 2009–12 (see Table 2), and 71.7 per cent as indicated by the patient files and 55.2 per cent as per the ED attendance registers for the period 2011–12 (see Table 3). Of all the non-transport-related injuries, more than half (52.3 per cent) were documented as interpersonal injuries in the patient files from 2011–12, compared to the much lower percentages of 12.8, 9.1, and 8.9, as recorded in the registers for the periods 2003–06, 2009–12, and 2011–12, respectively (see Tables 2 and 3). This marked discrepancy is most likely due to the fact that registers provide much less information about intentionality than the patient files do.

Table 2 Types of injury presenting to Redemption, 2003–06 and 2009–12

Types of injury	ED attendance registers (2003–06)		ED attendance registers (2009–12)	
	Number	%	Number	%
Total injuries	1,126	100.0	1,165	100.0
Transport-related*	238	21.1	398	34.2
Non-transport-related*	888	78.9	767	65.8
Interpersonal**	114	12.8	70	9.1

Notes: * As a percentage of all injuries; ** as a percentage of all non-transport-related injuries.

Table 3 Types of injury presenting to Redemption, May 2011–August 2012

Types of injury	Patient files (May 2011–August 2012)		ED attendance registers (May 2011–August 2012)	
	Number	%	Number	%
Total injuries	614	100.0	366	100.0
Transport-related*	174	28.3	164	44.8
Non-transport-related*	440	71.7	202	55.2
Interpersonal**	230	52.3	18	8.9

Notes: * As a percentage of all injuries; ** as a percentage of all non-transport-related injuries.

Table 4 Recorded interpersonal injuries, by type, at Redemption

Injury type	Patient files (May 2011–August 2012) (n=230)		ED attendance registers (2003–06) (n=114)		ED attendance registers (2009–12) (n=70)	
	Number	%	Number	%	Number	%
Laceration	139	60.4	29	25.4	21	30.0
Trauma	59	25.7	59	51.8	42	60.0
Wound	8	3.5*	10	8.8**	2	2.9
Abrasion	7	3.0	0	0.0	0	0.0
Human bite	6	2.6	16	14.0	3	4.3
Contusion	6	2.6	0	0.0	0	0.0
Sexual assault	2	0.9	0	0.0	0	0.0
Fracture	1	0.4	0	0.0	1	1.4
Epistaxis (secondary to trauma)	1	0.4	0	0.0	0	0.0
Burns	1	0.4	0	0.0	0	0.0
Amputation	0	0.0	0	0.0	1	1.4

Notes: * Four of the wounds were gunshot wounds; ** all ten of the wounds were gunshot wounds. Intentionality was recorded in only 6.8–30.0 per cent of cases registered in the ED attendance registers. Data on self-directed injuries was not collected from Redemption patient files.

The sub-sample review at Redemption revealed that transport-related injuries increased as a proportion of total injuries, from 21.1 per cent in 2003–06 to 34.2 per cent in 2009–12. In contrast, interpersonal injuries decreased very slightly, dropping by 3.7 per cent over the same period (see Table 2).

Patient files show that the most common types of interpersonal injuries were lacerations (60.4 per cent), followed by unspecified trauma (25.7 per cent) (see Table 4). Only four gunshot wounds were among the 440 non-transport-related injuries (see Table 5).

The most common non-transport-related injuries recorded in Redemption patient files (2011–12) and ED attendance registers (for 2003–06 and 2009–12) were trauma and lacerations (see Table 4). Data from the ED attendance registers suggests a reduction in gunshot wounds over time, from ten in 2003–06 to none in 2009–12 (see Table 5 and Figure 1). The data also indicates that the same period witnessed a reduction in human bites and an increase in puncture wounds. The significance of these changes is difficult to interpret since the audit used a random sample of records.

Figure 1 **Annual proportions of interpersonal injuries recorded in ED attendance registers, by type, at Redemption, 2003–06 and 2009–12**

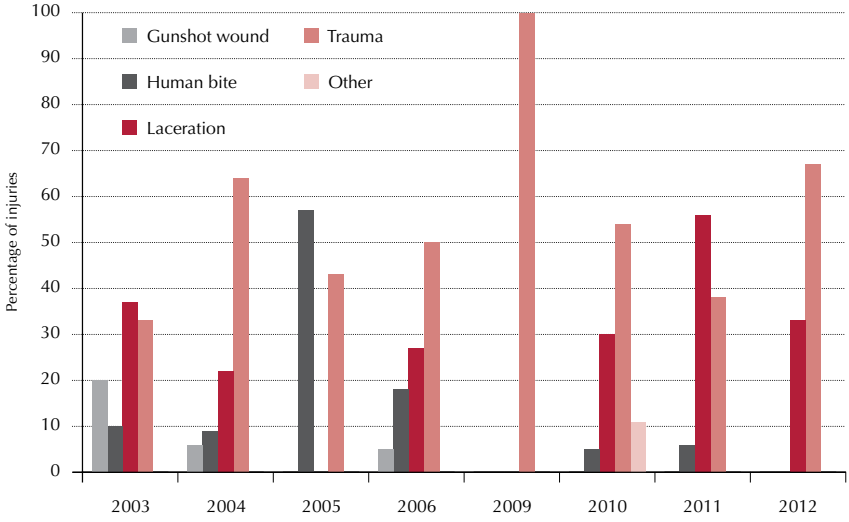


Table 5 **Recorded non-transport-related injuries, by type, at Redemption**

Injury type		Patient files (May 2011–August 2012) (n=440)		ED attendance registers (2003–06) (n=888)		ED attendance registers (2009–12) (n=767)	
		Number	%	Number	%	Number	%
Laceration		261	59.3	464	52.3	352	45.9
Trauma		96	21.8	155	17.5	216	28.2
Abrasion		22	5.0	36	4.1	78	10.2
Wounds	Puncture	15	3.4	35	3.9	18	2.3
	Gunshot	4	0.9	10	1.1	0	0.0
	Stab	0	0.0	9	1.0	5	0.7
	Other	0	0.0	2	0.2	9	1.2
Burn		10	2.3	43	4.8	15	2.0
Contusion		10	2.3	17	1.9	0	0.0
Fracture		6	1.4	18	2.0	14	1.8
Human bite		5	1.1	17	1.9	5	0.7
Animal bite		5	1.1	13	1.5	21	2.7
Sexual assault		2	0.5	11	1.2	0	0.0
Toxic ingestion		1	0.2	24	2.7	15	2.0
Epistaxis/bleeding (secondary to trauma)		1	0.2	10	1.1	13	1.7
Dislocation		1	0.2	6	0.7	1	0.1
Alcohol intoxication		0	0.0	1	0.1	2	0.3
Other		1	0.2	17	1.9	3	0.4

Notes: The authors did not systematically collect data on alcohol intoxication from Redemption records. The patient files break down the 10 burns into 3 caused by hot water, 1 by chemicals, 1 by electricity, 1 by a house on fire, and 4 due to undetermined causes; 1 amputation is listed in the 'other' category.

An analysis of patient files from May 2011 to August 2012 shows that more than one-third (38.7 per cent) of interpersonal injuries at Redemption were the result of armed violence. The weapon type was documented in 37.0 per cent of the cases; in just over half of the cases (50.4 per cent), however, it was unclear to the authors whether a weapon was involved (see Table 6). Based on the patient files, bladed weapons were the most commonly used weapon in cases of armed violence (24.7 per cent), followed by glass bottles (12.4 per cent) (see Table 7).

The attendance registers at Redemption had relatively poor documentation of weapons use in both periods under review, with 77.2 and 95.7 per cent of interpersonal injury cases having no documentation as to whether a weapon was involved in 2003–06 and 2009–12, respectively.

Table 6 Interpersonal injuries and documentation of weapons use at Redemption

Documentation of weapons use	Patient files (May 2011–August 2012) (n=230)		ED attendance registers (2003–06) (n=114)		ED attendance registers (2009–12) (n=70)	
	Number	%	Number	%	Number	%
Injury from armed violence, but weapon type not identified	4	1.7	0	0.0	0	0.0
Injury not inflicted with weapon	25	10.9	16	14.0	3	4.3
Injury from identified weapon	85	37.0	10	8.8	0	0.0
Undetermined or not documented	116	50.4	88	77.2	67	95.7

Notes: This table does not include cases for which no entry was made regarding intentionality, but for which the agent causing the injury was identified, such as hot water, hot oil, or a caustic agent for a burns injury. As a result, the proportion of all cases in which weapons were used may be an underestimate.

Table 7 Record of weapons used in cases of armed violence, by type, at Redemption

Type of weapon used	Patient files (May 2011–August 2012) (n=89)		ED attendance registers (2003–06) (n=10)		ED attendance registers (2009–12) (n=1)	
	Number	%	Number	%	Number	%
Bladed weapon	22	24.7	0	0.0	1	100.0
Glass bottle	11	12.4	0	0.0	0	0.0
Stick	8	9.0	0	0.0	0	0.0
Rock	7	7.9	0	0.0	0	0.0
Sharp instrument	7	7.9	0	0.0	0	0.0
Blunt instrument	6	6.7	0	0.0	0	0.0
Firearm	4	4.5	10	100.0	0	0.0
Iron	4	4.5	0	0.0	0	0.0
Caustic agent	1	1.1	0	0.0	0	0.0
Unknown object	3	3.4	0	0.0	0	0.0
Other	16	18.0	0	0.0	0	0.0

According to both the patient files and ED attendance registers, men sustained the majority of all injuries, accounting for 63.0–67.8 per cent of all victims (see Table 8). Indeed, a greater proportion of men than women were victims of transport-related injuries, non-transport-related injuries, interpersonal injuries, and injuries from armed violence.

The audit of the sub-sample of patient files indicates that the data provided to the medical records staff and to the Ministry of Health and Social Welfare showed similar proportions of transport- and non-transport-related injuries Based on the summaries prepared for the Ministry, Redemption treated a

Table 8 Recorded victims of injuries, by sex and injury type, at Redemption

Types of injury	Sex	Patient files (May 2011–August 2012) (n=612)		ED attendance registers (2003–06) (n=1,168)		ED attendance registers (2009–12) (n=1,165)	
		Number	%	Number	%	Number	%
All injuries	Female	196	32.0	403	34.5	425	36.5
	Male	415	67.8	736	63.0	736	63.2
	Unspecified	1	0.2	29	2.5	4	0.3
Transport-related injuries	Female	56	32.2	99	41.8	133	32.8
	Male	118	67.8	137	57.8	270	66.5
	Unspecified	0	0.0	1	0.4	3	0.7
Non-transport-related injuries	Female	140	32.0	304	32.7	292	38.5
	Male	297	67.8	599	64.3	466	61.4
	Unspecified	1	0.2	28	3.0	1	0.1
Interpersonal injuries (including from armed violence)	Female	73	31.7	52	46.0	32	45.7
	Male	154	67.0	61	54.0	37	52.9
	Unspecified	3	1.3	0	0.0	1	1.4
Injuries from armed violence	Female	19	21.8	1	10.0	0	0.0
	Male	68	78.2	9	90.0	1	100.0
	Unspecified	0	0.0	0	0.0	0	0.0

higher proportion of transport-related injuries as admitted inpatients than as outpatients, while the opposite was the case for non-transport-related injuries. Equal proportions of inpatient deaths were reported with respect to cases of transport- and non-transport-related injuries (see Table 9).

Table 9 Redemption monthly summaries prepared for the Ministry of Health and Social Welfare, September 2011–June 2012

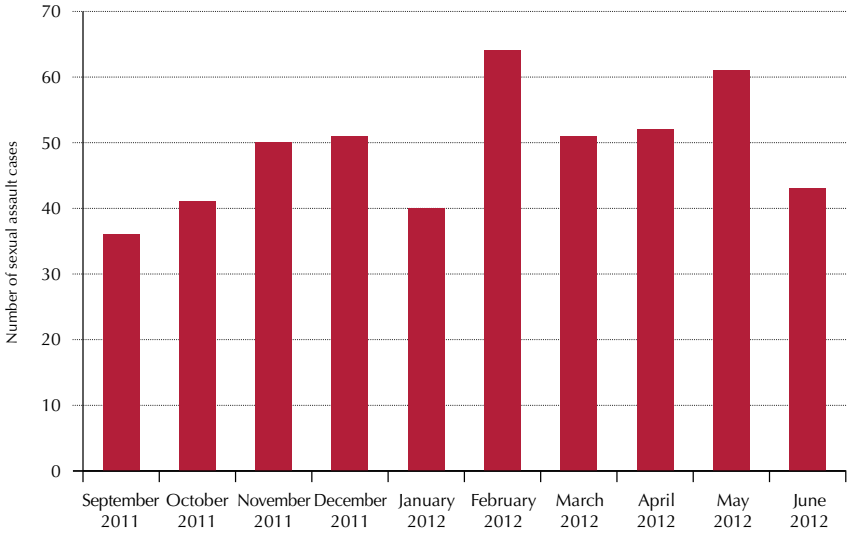
Type of injury	Outpatient attendance (n=44,748)		Inpatient cases discharged (n= 54,753)		Inpatient deaths (n=625)	
	Number	%	Number	%	Number	%
Total injuries*	**432**	**1.0**	**4,920**	**9.0**	**6**	**1.0**
Transport-related**	126	29.2	2,349	47.7	3	50.0
Non-transport-related**	306	70.8	2,571	52.3	3	50.0

Notes: * As a percentage of total attendance, discharges, and deaths; ** as a percentage of total injuries.

Photo 5 Health promotion poster advertising Redemption's rape victims' clinic next to the hospital's entrance.
Source: Lucie Collinson

As discussed above, the monthly summary tables provided to the Ministry of Health and Social Welfare by St. Joseph's did not include any data on sexual assault cases. In stark contrast, a high number of sexual assault cases presented to Redemption's free (no-cost) rape victims' clinic (see Figure 2 and Photo 5). In fact, the average number of sexual assaults per month (49 recorded; see Figure 2) is roughly

Figure 2 **Sexual assault victims presenting to Redemption's rape victims' clinic per month, September 2011–June 2012**



three times higher than the number of interpersonal injuries presenting to the hospital's emergency department (15; see Table 3). At the time of writing, LAVO was not capturing any information on these sexual assault cases.

The data on injuries that LAVO currently receives from Redemption stems exclusively from the ED attendance registers. In order to assess the value of these registers as sources of data on the intentionality of injuries, the authors compared the diagnoses recorded in them with those documented in the 391 corresponding patient files involving non-transport-related injuries sustained in 2011–12. This sub-sample of patient files from Redemption documented more assaults than the total number supplied to LAVO for the same period.

Of the 391 cases, 12 per cent were recorded as assaults in the ED attendance registers, whereas three times as many cases—36 per cent—were classified as such in the corresponding patient files. Of the 216 assaults recorded in the patient files, about a third were clearly labelled as 'assault' cases on the front cover of the file. It may be deduced that medical records staff often failed to

Table 10 **Data recorded on injury cases, by type of data and source, at Redemption**

Type of data	Patient files (May 2011–August 2012) (n=612)		ED attendance registers (2003–06) (n=1,168)		ED attendance registers (2009–12) (n=1,165)	
	Number	%	Number	%	Number	%
Date (day in the month)	NC	–	0	0.0	882	75.7
Year and month	612	100.0	1,168	100.0	1,165	100.0
Time	NC	–	0	0.0	0	0.0
Sex	611	99.8	1,165	99.7	1,160	99.6
Age	611	99.8	1,161	99.4	1,161	99.7
Diagnoses	612	100.0	1,168	100.0	1,165	100.0
Mechanism(s)	477	77.9	238	20.4	568	48.8
Anatomical location(s)	572	93.5	61	5.2	31	2.7
Intentionality	588	96.1	354	30.3	79	6.8
Perpetrator (other human)	157	25.7	0	0.0	1	0.1
Weapon(s)	216	35.3	10	0.9	1	0.1
Treatment	NC	–	0	0.0	0	0.0
Date admitted and date discharged (length of stay)	NC	–	0	0.0	485	41.6
Occupation	NC	–	0	0.0	0	0.0
Lab tests	NC	–	0	0.0	0	0.0
Imaging	NC	–	0	0.0	0	0.0
Total bill	NC	–	0	0.0	0	0.0

Notes: NC = data not collected routinely by the authors during the audit. The table provides percentages of all injuries in the data sample.

record cases as assaults in the registers even though they had been classified as such by ED staff.

The analysis conducted for this study also revealed that Redemption patient files constitute a much richer data source on details of injuries compared to the attendance registers from 2003–06 and 2009–12, particularly with regard to the mechanism of injury (which was indicated in 77.9 per cent of the patient files vs. 20.4 and 48.8 per cent in registers, respectively); anatomical location (93.5 vs. 5.2 and 2.7 per cent); intentionality (96.1 vs. 30.3 and 6.8 per cent); perpetrator (25.7 vs. 0.0 and 0.1 per cent); and the weapon used (35.3 vs. 0.9 and 0.1 per cent) (see Table 10).

As discussed below, more than 99 per cent of the data provided to LAVO did not include perpetrator data (see Table 19 and Figure 7). Yet such information was recorded in Redemption patient files, which indicate that the three most common types of perpetrators of violent assaults were friends of the victims (13.5 per cent), other men (9.1 per cent), and male intimate partners of the victims (7.8 per cent) (see Table 19).

Findings from St. Joseph's

At St. Joseph's, patient files provide the most comprehensive information on each injury case, supplying more details than both ED attendance notes and admissions registers on all variables besides treatment (see Table 11). However, monthly summaries from the ED notes are the primary source of information currently provided to LAVO by St. Joseph's, which means that the Observatory is not capturing key data that stakeholders need to make informed decisions on violence prevention strategies.

As Table 12 shows, patient files provide more information on weapons use in interpersonal injuries than the other two data sources. While patient files (n=11) document the involvement of a weapon in more than one-third (36.4 per cent) of injuries and indicate uncertainty regarding weapons use in another third of the cases, the ED attendance notes suggest that only 16.2 per cent of injuries were inflicted with a weapon and that information on weapons use was not available in the vast majority of the cases (83.8 per cent).

Of the 37 interpersonal injuries presenting to St. Joseph's ED between June and October 2011, six (16.2 per cent) were the result of armed violence (see Table 12). This figure is likely to be an underestimate, as it is not known how many of the remaining interpersonal injuries were implemented with weapons. The identified weapons used included firearms, rocks, glass bottles, sticks, whips, and planks (see Table 13).

The admissions registers show that the vast majority (80.0 per cent) of intentional injuries were self-inflicted by individuals who had overdosed on drugs or alcohol. Such injuries were sustained by ten victims between the ages of 13 and 35, whose average age was 24 years.

For reasons that have yet to be established, the ED attendance notes indicate that women make up 53 per cent of victims of interpersonal injuries, while the admissions registers show that they account for only 30 per cent (see Table 14). This discrepancy may reflect variations in the severity of injuries

Table 11 **Data inclusion in different sources at St. Joseph's**

Data category	ED attendance notes (June–October 2011) (n=304)		Admissions registers (July 2011–July 2012) (n=151)		Patient files (July 2011–July 2012) (n=62)	
	Number	%	Number	%	Number	%
Date of attendance	304	100	151*	100.0	62*	100.0
Time of attendance	182	59.9	0	0.0	44	71.0
Sex	284	93.4	151	100.0	61	98.4
Age	241	79.3	130	86.1	59	95.2
Diagnoses	304	100.0	151	100.0	62	100.0
Mechanism(s)	152	50.0	58	38.4	52	83.9
Anatomical location(s)	187	61.5	0	0.0	54	87.1
Intentionality	46	15.1	2	1.3	43	69.4
Perpetrator	4	1.3	0	0.0	13	21.0
Weapon(s)/ object(s) involved in injury	25	8.2	1	0.7	4	6.5
Treatment	201	66.1	0	0.0	27	43.5
Length of stay	0	0.0	151	100.0	44	71.0
Date admitted and date discharged	0	0.0	0	0.0	61	98.4
Occupation	0	0.0	0	0.0	17	27.4
Lab tests	7	2.3	0	0.0	38	61.3
Imaging	7	2.3	0	0.0	28	45.2
Total costs to patient	0	0.0	0	0.0	62	100.0

Notes: * Month and year provided rather than exact date.
It is unclear why records may lack data on particular categories. In some instances, data was not provided by a patient, or if it was provided, it was not recorded.

Table 12 **Recorded injuries from armed violence and weapon use in interpersonal injuries at St. Joseph's**

Data category	ED attendance notes (June–October 2011) (n=37)		Admissions registers (July 2011–July 2012) (n=2)		Patient files (July 2011–July 2012) (n=11)	
	Number	%	Number	%	Number	%
Injury from armed violence but weapon type not stated*	0	0.0	1	50.0	2	18.2
Weapon involved	6	16.2	1	50.0	4	36.4
Weapon not involved	0	0.0	0	0.0	1	9.1
Unknown whether weapon was involved	31	83.8	0	0.0	4	36.4

Notes: * For example, the record may document an injury as a 'stab wound', but provide no details on the weapon used. This table does not include self-directed injuries or injuries for which intentionality was not documented although the cause was recorded, such as hot water, hot oil, or a caustic agent in case of a burns injury.

sustained by men and women; men may tend to be so severely injured as to require hospitalization, whereas women may be more easily treated in an emergency room and then discharged. Women may also be less able to afford a hospital stay, either because they need to be home to care for children or because they lack the financial means (GoL and UN, n.d.). It could be instructive to explore the demographics of injured individuals who were admitted or discharged after presenting to an emergency department. The results could shed light on the severity of injuries sustained by men and women and on whether they are receiving equal care.

The monthly summary table sent to the Ministry of Health and Social Welfare shows that the hospital admitted more victims of non-transport-related injuries than of transport-related injuries, as more of the latter were treated in the outpatient department (see Table 15). While patient admissions forms could easily include details on the circumstances of an injury, such

Table 13 Recorded weapons used in cases of armed violence, by type, at St. Joseph's

Type of weapon used	Number of weapons reported per source			Total	
	ED attendance notes (June–October 2011)	Admissions registers (July 2011–July 2012)	Patient files (July 2011–July 2012)	Number	%
Glass bottle	1	0	2	3	27.3
Rock	2	0	0	2	18.2
Stick	1	0	1	2	18.2
Caustic agent	0	0	1	1	9.1
Firearm	0	1	0	1	9.1
Plank	1	0	0	1	9.1
Whip	1	0	0	1	9.1
Total	**6**	**1**	**4**	**11**	**100.0**

Note: Due to rounding, totals do not necessarily equal 100 per cent.

records would also need to be provided to LAVO to be of use in the design of injury-reduction interventions.

The reviewed monthly summaries that St. Joseph's sent to the Ministry of Health and Social Welfare did not include any data entries related to sexual assault, perhaps because survivors of sexual assault attended Redemption's rape victims' clinic. Data provided to LAVO from these monthly summaries includes all injuries seen in the emergency room, admissions, discharges, and deaths.

From 10 June to 27 October 2011, the emergency department at St. Joseph's received 2,292 cases. Of these, 304 (13.3 per cent) were injuries (see Table 16), 53.0 per cent of which were sustained by men and 40.5 per cent by women (see Table 14). Of the 304 injuries, 185 (60.9 per cent) were non-transport-related, the most common of which were lacerations (48.1 per cent), followed by trauma (18.9 per cent) (see Table 17).

Table 14 Recorded victims of injuries, by sex and injury type, at St. Joseph's

Types of injury	Sex	ED attendance notes		Admissions registers		Patient files	
		Number	%	Number	%	Number	%
All injuries	Female	123	40.5	49	32.6	20	32.3
	Male	161	53.0	101	67.3	41	66.1
	Unspecified	20	6.6	0	0.0	1	1.6
Transport-related injuries	Female	47	39.5	10	18.9	4	44.4
	Male	66	55.5	43	81.1	5	55.6
	Unspecified	6	5.0	0	0.0	0	0.0
Non-transport-related injuries	Female	76	41.1	39	40.2	16	30.2
	Male	95	51.4	58	59.8	36	67.9
	Unspecified	14	7.6	0	0.0	1	1.9
Interpersonal injuries (including from armed violence)	Female	24	53.3	3	30.0	5	38.5
	Male	18	40.0	7	70.0	8	61.5
	Unspecified	3	6.7	0	0.0	0	0.0
Injuries from armed violence	Female	2	33.3	1	50.0	2	33.3
	Male	4	66.7	1	50.0	4	66.7
	Unspecified	0	0.0	0	0.0	0	0.0

Table 15 St. Joseph's monthly summaries prepared for the Ministry of Health and Social Welfare, January–March 2012

Injuries	Outpatient attendance		Inpatient cases discharged		Inpatient deaths	
	Number	%	Number	%	Number	%
Total injuries	**116**	**100.0**	**104**	**100.0**	**13**	**100.0**
Transport-related	92	79.3	11	10.6	2	15.4
Non-transport-related	24	20.7	93	89.4	11	84.6

Table 16 **Recorded injuries, by type, at St. Joseph's**

Injuries	ED attendance notes (June–October 2011)		Admissions registers (July 2011–July 2012)		Patient files (July 2011–July 2012)	
	Number	%	Number	%	Number	%
Total injuries*	304	13.3	151	3.1	62	n/a^
Transport-related**	119	39.1	53	35.1	9	14.5
Non-transport-related**	185	60.9	97	64.2	53	85.5
Interpersonal***	45	24.3	2	2.1	13	24.5

Notes: From 10 June to 27 October 2011, the emergency department at St. Joseph's received 2,292 cases; over this period, 4,870 patients were admitted. * Total injuries as a percentage firstly of all ED attendances and secondly of all hospital admissions; ** transport-related injuries as a percentage of total injuries; ***interpersonal injuries as a percentage of non-transport-related injuries; ^ the percentage cannot be calculated because the sample based on patient files was random and incomprehensive.

Based on the admissions registers for the period July 2011 to July 2012, St. Joseph's admitted 4,882 patients, 151 (3.1 per cent) of whom were injured (32.5 per cent women and 67.5 per cent men). Just over one-third of the injuries (53, or 35.1 per cent) were transport-related (see Table 16). Of the 97 non-transport-related injuries, the most common injury type was trauma (29.9 per cent), followed by fractures (24.7 per cent), burns (16.5 per cent), and toxic ingestion (10.3 per cent) (see Table 17).

The authors also collected data from a random sample of patient files documenting newly injured patients who were admitted to St. Joseph's from July 2011 to July 2012 (see Table 17). Patients who were returning for surgery or further treatment from an old injury were excluded.

The ED attendance notes provide a breakdown of non-transport-related injuries: of the 17 animal bites, 15 were caused by dogs, 1 by a snake, and 1 by a baboon; 6 of the 11 wounds were puncture wounds; of the 10 burns, 2 were caused by electricity, 2 by hot water, 1 by fire, and 1 by hot oil.

Meanwhile, admissions registers list these causes of non-transport-related injuries: of the 29 trauma cases, 10 involved head injuries and 2 were documented as 'chemical trauma', yet as it was unclear whether toxic ingestion

Table 17 **Recorded non-transport-related injuries, by type, at St. Joseph's**

Injury type	ED attendance notes (June–October 2011)		Admissions registers (July 2011–July 2012)		Patient files (July 2011–July 2012)	
	Number	%	Number	%	Number	%
Laceration	89	48.1	7	7.2	5	9.4
Trauma	35	18.9	29	29.9	17	32.1
Animal bite	17	9.2	1	1.0	0	0.0
Wound	11	5.9	3	3.1	5	9.4
Burn	10	5.4	16	16.5	10	18.9
Abrasion	6	3.2	0	0.0	0	0.0
Toxic ingestion	5	2.7	10	10.3	5	9.4
Human bite	4	2.2	0	0.0	0	0.0
Alcohol intoxication	3	1.6	2	2.1	1	1.9
Fracture	2	1.1	24	24.7	10	18.9
Dislocation	1	0.5	2	2.1	0	0.0
Epistaxis/bleeding (secondary to trauma)	1	0.5	2	2.1	0	0.0
Near drowning	1	0.5	0	0.0	0	0.0
Other	0	0.0	1	1.0	0	0.0
Total	**185**	**100.0**	**97**	**100.0**	**53**	**100.0**

or an internal burn had occurred in the latter 2 cases, they were classified as general trauma; of the 16 burns, 1 was chemical while the remaining 15 had unknown causes; of the 3 wounds, 2 were caused by punctures while 1 was a gunshot wound; the only animal bite was listed as a snake bite; and the 'other' wound was a tendon rupture.

Of note is that the injury type classifications in Table 17 are not mutually exclusive; in some cases, the terms may overlap, as is the case with 'wound', 'laceration', and 'trauma'.

The most common injury types at both hospitals under review

The majority of injuries presenting to both Redemption and St. Joseph's were non-transport-related (see Figure 3). Interpersonal injuries made up more than half of non-transport-related injuries at Redemption (see Figure 4), while lacerations and unspecified trauma accounted for most of the interpersonal injuries at both hospitals (see Figure 5).

Figure 3 Types of injury presenting to each hospital

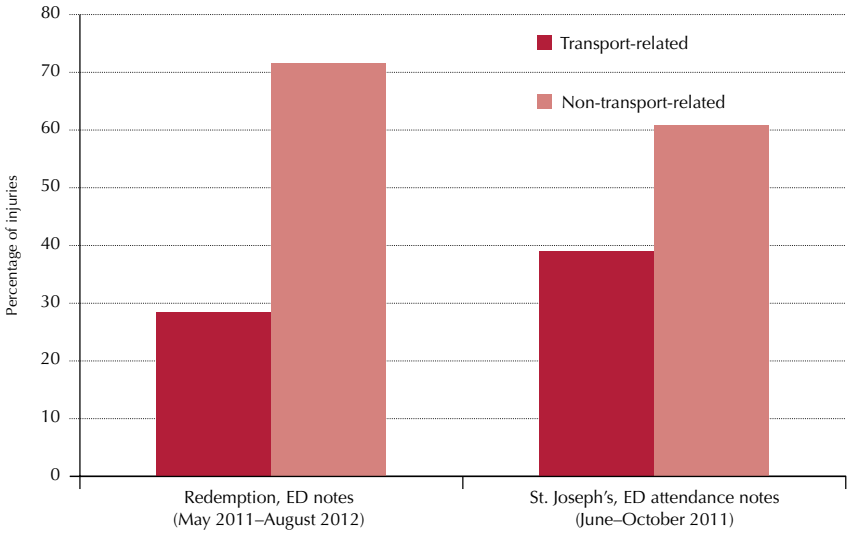


Figure 4 Interpersonal injuries as a proportion of non-transport-related injuries at both hospitals

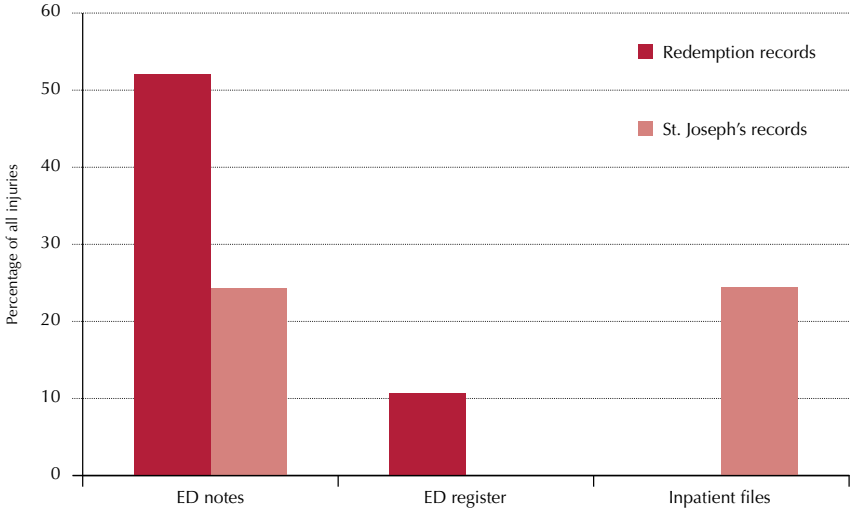
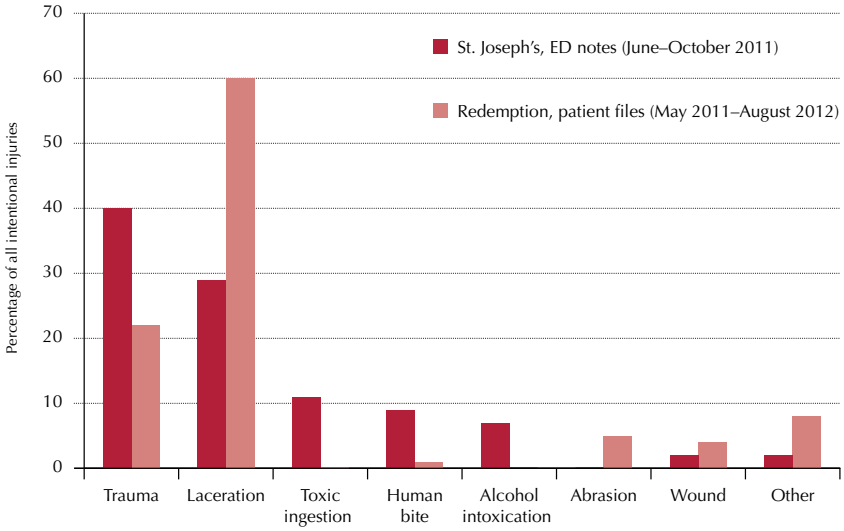


Figure 5 Types of intentional injuries at both hospitals



Note: 'Other' includes burns, epistaxis, contusions, fractures, and animal bites.

Data provided to LAVO vs. audit data from Redemption

The Liberian National Police was the biggest data provider to LAVO for the period July 2011 to June 2012, supplying 70.6 per cent of all data (see Table 18).

Table 18 **Distribution of cases registered by LAVO, by source, July 2011–June 2012**

Source	Number of cases	%
Liberian National Police	1,011	70.6
United Nations Police	211	14.7
Redemption	117	8.2
Media	35	2.4
St. Joseph's	31	2.2
Liberia Early-Warning and Response Network	26	1.8
Total	**1,431**	**100.0**

At the time of writing, Redemption was providing LAVO with injury data from its ED attendance registers, but not from its patient files. Table 19 compares the register-based data received by LAVO with the audit data drawn from patient files from 2011–12, highlighting demographic details of intentionally injured patients who attended Redemption and the types of weapons used to inflict their injuries.

The Redemption audit shows that other puncture wounds were the most common, followed by lacerations. Similarly, the LAVO data set indicates that other puncture wounds, such as a bite, were by far the most common. A direct comparison of the frequency of each interpersonal injury type cannot be made between the two data sets due to the variations in data collection methods. The relative proportions of violent injuries can be compared, however.

Table 19 **Completeness of injury data in LAVO sources vs. Redemption audit, July 2011–June 2012**

Recorded data		All LAVO sources*		LAVO police and media data		LAVO Redemption data		Redemption audit	
		Number	%	Number	%	Number	%	Number	%
Total interpersonal injuries/armed assaults		1,431	100	1,283	100	117	100	230	100
Sex of victim	Men	934	65.3	830	64.7	83	70.9	154	67.0
	Women	444	31.0	402	31.3	34	29.1	73	31.7
	Not specified	53	3.7	51	4.0	0	0.0	3	1.3
Diagnosis	Laceration/ abrasion	60	4.2	0	0.0	52	44.4	146	63.5
	Gunshot wound	1	0.1	0	0.0	3	2.6	4	1.7
	Other puncture wound (such as bite)	1,351	94.4	805	62.7	61	52.1	12	5.2
	Other (such as fracture, haematoma)	0	0.0	0	0.0	1	0.9	9	3.9
	Trauma, unspecified	0	0.0	0	0.0	0	0.0	59	25.7
	Sexual assault	19	1.3	19	1.5	0	0.0	0	0.0
Other crime in progress	Yes	469	32.8	466	36.3	2	1.7	9	3.9
	Not specified	962	67.2	817	63.7	115	98.3	221	96.1
Use and type of weapon	Other objects (such as rocks or sticks)	664	46.4	549	42.8	72	61.5	49	21.3
	Bladed weapon	487	34.0	466	36.3	24	20.5	22	9.6
	Firearm	186	13.0	186	14.5	3	2.6	4	1.7
	Glass bottle	60	4.2	43	3.4	13	11.1	11	4.8
	Unidentified object	48	3.4	39	3.0	5	4.3	3	1.3
	No weapon	0	0.0	0	0.0	n/a	n/a	25	10.9
	Unknown whether weapon was used	0	0.0	0	0.0	n/a	n/a	116	50.4

Recorded data		All LAVO sources*		LAVO police and media data		LAVO Redemption data		Redemption audit	
		Number	%	Number	%	Number	%	Number	%
Perpetrator (relationship to victim)	Male intimate partner	0	0.0	0	0.0	0	0.0	18	7.8
	Female intimate partner	0	0.0	0	0.0	0	0.0	6	2.6
	Male relative	0	0.0	0	0.0	0	0.0	9	3.9
	Female relative	0	0.0	0	0.0	0	0.0	2	0.9
	Friend	0	0.0	0	0.0	0	0.0	31	13.5
	Thief, other criminal	3	0.2	3	0.2	1	0.9	13	5.7
	Police	0	0.0	0	0.0	0	0.0	6	2.6
	Other male	0	0.0	0	0.0	0	0.0	21	9.1
	Other female	0	0.0	0	0.0	0	0.0	8	3.5
	Group of people	1	0.1	0	0.0	0	0.0	3	1.3
	Not specified	1,427	99.7	1,280	99.8	116	99.1	113	49.1

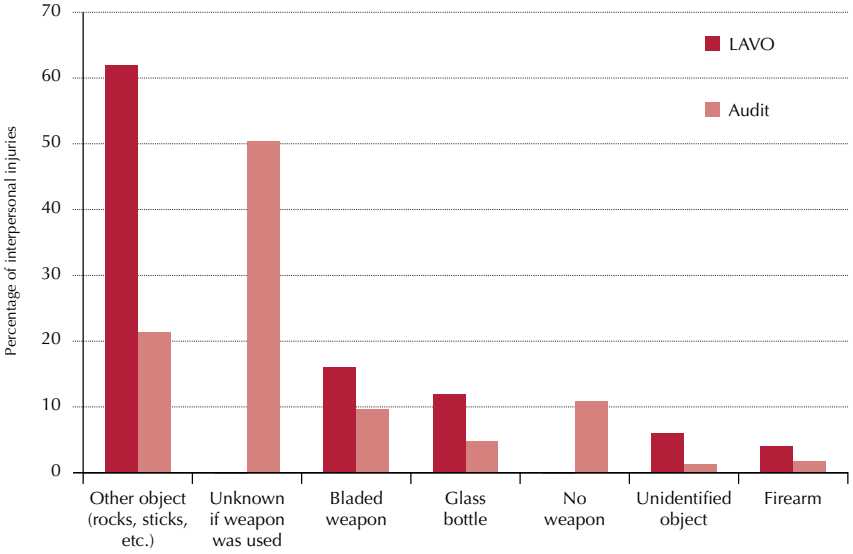
Notes: * LAVO sources include records of criminal acts only if they explicitly mention injuries. LAVO Redemption data reflects information drawn from the ED attendance registers covering July 2011–June 2012. The audit data is based on the hospital's patient files from 2011–12.

While the LAVO police and media data reports on more crimes than does the LAVO data set from Redemption, the differences regarding the male-to-female ratio and diagnoses are minimal. A major difference in the data concerns information on firearm use; while LAVO only receives data on injuries that are known to have been caused by weapons, the audit reflects data on all interpersonal injuries, and therefore also on cases in which the use of a weapon could not be established (see Table 19). Yet the most significant discrepancy in the data concerns details on the perpetrators of interpersonal injuries; unlike the LAVO data, the audit data provides sex-disaggregated information on whether the perpetrator was a criminal, police officer, or an intimate partner, relative, or friend of the victim (see Figure 7). Although the

proportion of cases in which the perpetrator was not documented in audit data was high (49.1 per cent), it was twice as high in the data set given to LAVO by Redemption (99.1 per cent) (see Table 19).

As noted earlier, most of LAVO's data is made available by the Liberian National Police. For the period July 2011 to June 2012, the force provided 70.6 per cent of the data on armed assaults, whereas 10.4 per cent was supplied by the two hospitals (see Table 18). The male-to-female ratios of victims of interpersonal injuries are similar across all data sets in Table 19, with men accounting for the majority of the victims. Compared to hospital data, information on diagnoses was poorly coded in both the police and media sources; however, police data provided more systematic information on weapons used. As noted above, the audit data—which was entirely based on information contained in patient files—contained the most information on perpetrator demographics.

Figure 6 **Redemption documentation of weapons use in interpersonal injuries, LAVO data vs. audit data**

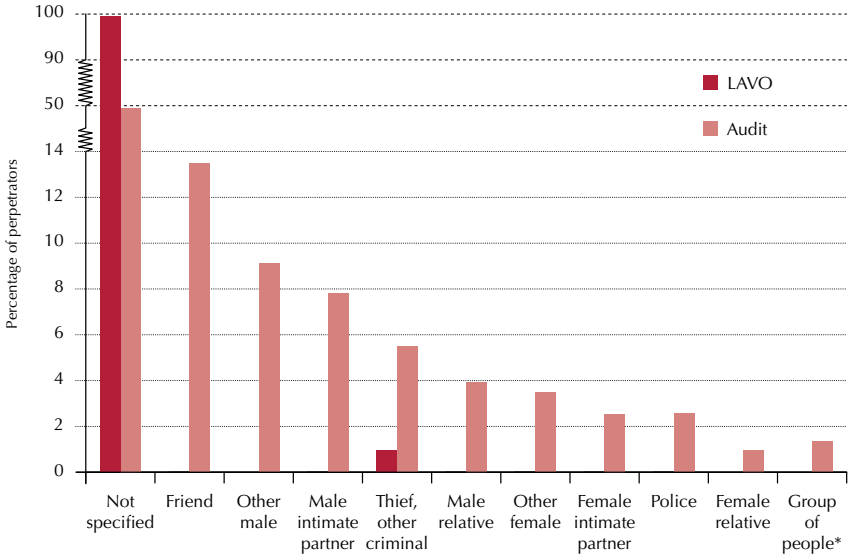


Notes: LAVO Redemption data reflects information drawn from the ED attendance registers covering July 2011–June 2012. The audit data is based on the hospital's patient files from 2011–12.

The audit results show that weapons use is not recorded in 50 per cent of the cases in Redemption's patient files (see Figure 6). Since hospital data is only sent to LAVO regarding cases in which weapons use has been established, the Observatory is not receiving information on these injuries, suggesting that its estimates of violence may suffer from significant undercounting.

As noted above, almost 100 per cent of the data provided to LAVO did not include details on perpetrators (see Table 19 and Figure 7). The audit data, reflecting rather comprehensive information on perpetrators from Redemption patient files, indicates that 23 per cent of the perpetrators were friends of the victims or other men. Nevertheless, the audit found that the perpetrator was not documented in roughly half of the cases, indicating that there is still room for improvement in data collection (see Figure 7).

Figure 7 **Redemption documentation of perpetrator details, LAVO data vs. audit data**



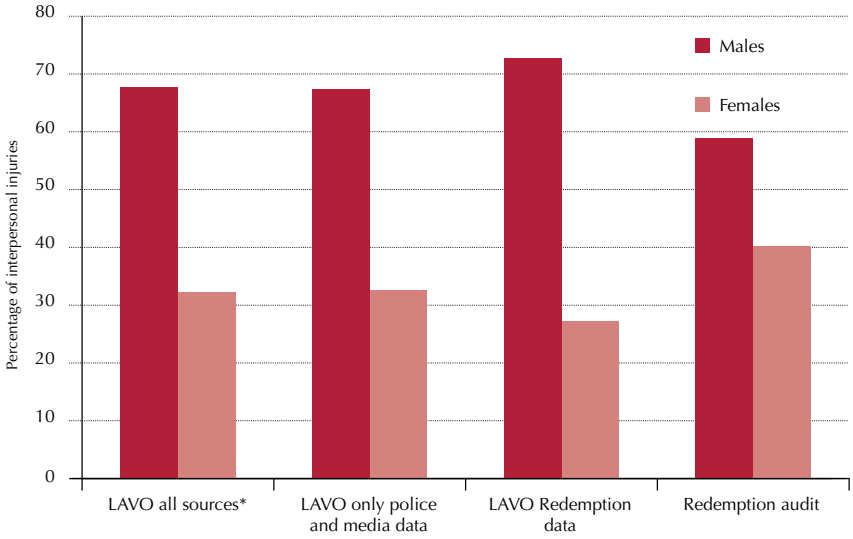
Notes: LAVO Redemption data reflects information drawn from the ED attendance registers covering July 2011–June 2012. The audit data is based on the hospital's patient files from 2011–12.
* No LAVO data available for 'Group of people'.

Table 20 **Demographics of victims of interpersonal injuries from Redemption, audit data vs. LAVO data, 2011–12**

Demographic data	LAVO data all sources (2011–12) (n=1,430)		LAVO police and media data (2011–12) (n=1,282)		Redemption data (2011–12) supplied to LAVO (n=110)		Audit of Redemption, ED attendance registers (2011–12) (n=149)	
	Number	%	Number	%	Number	%	Number	%
Men	934	67.8	830	67.4	80	72.7	88	59.0
Women	444	32.2	402	32.6	30	27.3	60	40.3

Notes: The Redemption data of both LAVO and the audit reflects information drawn from the ED attendance registers covering July 2011–June 2012. Yet whereas LAVO data is restricted to armed violence, the audit data includes interpersonal injuries sustained in the absence of weapons. Both data sets include cases in which weapons involvement or wound type was undetermined.
Percentage totals may not add up to 100 per cent due to rounding of sub-totals.

Figure 8 **Redemption information on sex of victims of interpersonal injuries, LAVO data vs. audit data**



Notes: The Redemption data of both LAVO and the audit reflects information drawn from the ED attendance registers covering July 2011–June 2012.

Women account for a higher proportion of victims of interpersonal injuries in the audit data—based on Redemption ED attendance registers—than in data submitted to LAVO (see Table 20 and Figure 8). That is, audit data suggests that women were significantly more likely to be a victim of interpersonal injury.

Data provided to LAVO vs. audit data from St. Joseph's

LAVO receives data on interpersonal injuries drawn from the ED attendance notes at St. Joseph's. The audit conducted for this study, which was based on data in the same attendance notes, picked up 32 interpersonal injuries than were registered by LAVO during the period 10 June–27 October 2011; of these injuries, for 31 records, no information was provided on whether a weapon was used (see Table 21). Details on the perpetrator were not recorded in any of LAVO's data from St. Joseph's, whereas they were provided in 10.8 per cent of the audit data.

Table 21 Completeness of interpersonal injury data in LAVO sources vs. audit data from St. Joseph's, 10 June–27 October 2011

Recorded data		All LAVO sources*		LAVO police and media data		LAVO St. Joseph's data		St. Joseph's audit	
		Number	%	Number	%	Number	%	Number	%
Total interpersonal injuries		190	100.0	150	100	5	100.0	37	100.0
Sex of victim**	Men	137	72.1	110	73.3	3	60.0	16	43.2
	Women	53	27.9	40	26.7	2	40.0	21	56.8
Diagnosis	Laceration/ abrasion	0	0.0	0	0.0	0	0.0	13	35.1
	Gunshot wound	0	0.0	0	0.0	0	0.0	0	0.0
	Other puncture wound (such as bite)	190	100.0	150	100.0	0	0.0	5	13.5
	Other (such as fracture, haematoma)	0	0.0	0	0.0	5	100.0	1	2.7
	Trauma, unspecified	0	0.0	0	0.0	0	0.0	18	48.6

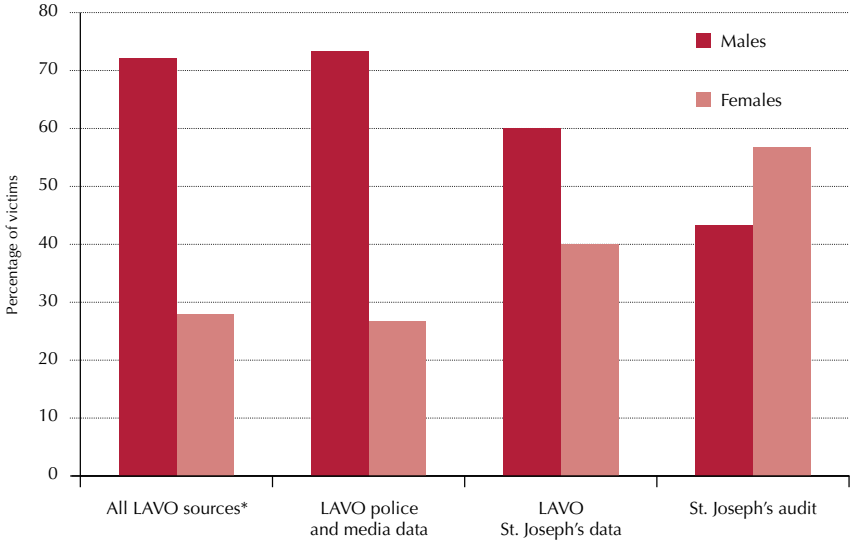
Recorded data		All LAVO sources*		LAVO police and media data		LAVO St. Joseph's data		St. Joseph's audit	
		Number	%	Number	%	Number	%	Number	%
Crime in progress	Yes	30	15.8	25	16.7	0	0.0	0	0.0
	No/not specified	160	84.2	125	83.3	5	100.0	37	100.0
Weapon type	Firearm	8	4.2	8	5.3	0	0.0	0	0.0
	Bladed weapon	76	40.0	70	46.7	0	0.0	0	0.0
	Glass bottle	10	5.3	10	6.7	2	40.0	1	2.7
	Other objects (such as rocks or sticks)	90	47.4	59	39.3	2	40.0	5	13.5
	Unidentified object	6	3.2	3	2.0	1	20.0	0	0.0
	Not specified	0	0.0	0	0.0	0	0.0	31	83.8
Perpetrator	Male intimate partner	0	0.0	0	0.0	0	0.0	2	5.4
	Female intimate partner	0	0.0	0	0.0	0	0.0	0	0.0
	Male relative	0	0.0	0	0.0	0	0.0	0	0.0
	Female relative	0	0.0	0	0.0	0	0.0	0	0.0
	Friend	0	0.0	0	0.0	0	0.0	1	2.7
	Thief, other criminal	0	0.0	0	0.0	0	0.0	0	0.0
	Police	0	0.0	0	0.0	0	0.0	0	0.0
	Other man	0	0.0	0	0.0	0	0.0	1	2.7
	Other woman	0	0.0	0	0.0	0	0.0	0	0.0
	Not specified	187	98.4	147	98.0	5	100.0	33	89.2
	Group	3	1.6	3	2.0	0	0.0	0	0.0

Notes: * LAVO sources include records of criminal acts only if they explicitly mention injuries. LAVO data from St. Joseph's reflects information drawn from the ED attendance notes covering June to October 2011. ** In three cases, the sex of the patient was not recorded (2 in LAVO sources, and 1 in St. Joseph's); this data is excluded from this table.

Moreover, as Table 21 shows, women accounted for 28.9 per cent more of the victims of interpersonal injuries in the audit data than in the data provided to LAVO by all of its sources, including St. Joseph's. The audit data also provides more details on diagnoses. As indicated above, the audit data shows 31 more cases in which the weapon type was not recorded, partly reflecting the fact that LAVO is only supplied with data on cases in which the use of a weapon is specified.

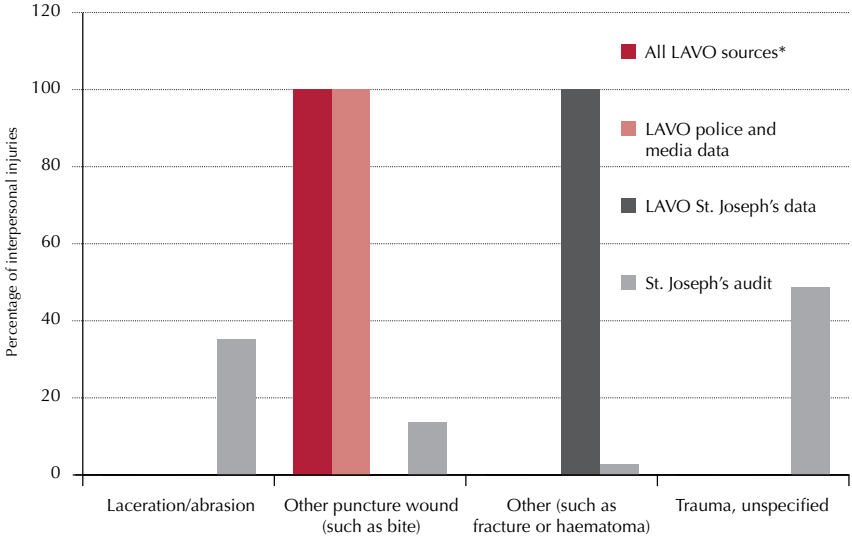
Figure 9 shows data discrepancies regarding the ratio of male to female victims of interpersonal injuries from the period June–October 2011. Women accounted for a significantly smaller proportion of the victims in LAVO data than in the audit data. LAVO data from St. Joseph's indicates that although women comprise a greater proportion of the victims than does the other data, that proportion is still far below that indicated by audit data.

Figure 9 Proportions of male vs. female victims of interpersonal injuries, LAVO sources vs. audit data, June–October 2011



Notes: * Only injuries included. LAVO data from St. Joseph's reflects information drawn from the ED attendance notes.

Figure 10 **Type of interpersonal injury recorded in the audit at St. Joseph's compared to data collected by LAVO**



Notes: * Only injuries included. LAVO data from St. Joseph's reflects information drawn from the ED attendance notes covering June–October 2011.

As Figure 10 highlights, data on the types of interpersonal injury varied by source. While most of the audit data related to unspecified trauma and lacerations/abrasions, LAVO's data from St. Joseph's was coded as 'other' and LAVO's police and media data was coded as 'other puncture wound'.

Summary of findings

As discussed above, the analysis of audit data drawn from Redemption and St. Joseph's, as compared to LAVO data provided by the same hospitals and other sources, including media reports and police records, reveals considerable variations—in terms of both the quantity and the quality of the data. Significantly, the study shows that LAVO is not receiving all the available hospital data on injuries from armed violence in Liberia. As a result, LAVO is limited in its ability to produce comprehensive reports to inform policy-making.

One of the reasons why LAVO is missing data on a large number of interpersonal injuries is that it is not relying on the most comprehensive data sources, such as Redemption patient files or St. Joseph's patient files, which are more detailed than ED attendance registers and ED notes and thus more valuable as a source for LAVO. As discussed, the registers at both studied hospitals contained limited information on whether an injury was interpersonal, whether a weapon was used, and who the perpetrator was. In contrast, the patient files contained such information, which can be crucial in efforts to identify risk factors and in designing effective violence prevention strategies. Still, even these more comprehensive sources tended to underreport the cause and intentionality of injuries.

With respect to Redemption, LAVO receives data that is drawn exclusively from ED attendance registers; consequently, the Observatory is missing at least 24 per cent of interpersonal injuries. That finding is based on the audit of 391 injuries recorded in 2011–12, which indicated that while the registers classified 12 per cent of the injuries as interpersonal, the patient files for the same cases identified 36 per cent as such.

LAVO's ability to identify trends in armed violence has also been challenged. A case in point relates to a significant decrease in the number of gunshot wounds over time, as indicated by the sub-sample of data from

Redemption, which contained information that was not supplied to LAVO (see Table 5).[3]

Sex-disaggregated hospital data is not efficiently captured by LAVO either. While the hospital audit based on ED attendance notes at St. Joseph's showed that 57 per cent of the victims of interpersonal injuries were women, LAVO's data from the same hospital indicated that only 40 per cent of the victims were women. Moreover, LAVO's data from media reports and police records showed that women accounted for only 27 per cent of the victims over the same time period (see Table 21). These differences underscore that hospitals are critical sources of sex-disaggregated data. As suggested below, future research could use the capture–recapture method to detect such discrepancies between hospital and LAVO data sets.

It would also be useful for LAVO to be supplied with hospital morgue records, which can serve as an important source of data on fatal injuries. At the time of writing, however, death certificates in Liberia contained only limited information relating to aspects of violent injuries.

In addition to facilitating the tracking of violent injuries, hospital records can also be used to generate estimates of the economic costs of violence, which can inform policy-makers and motivate them to prioritize armed violence prevention policies (Butchart et al., 2008). Furthermore, hospital records provide qualitative data on the social and psychological costs to victims, families, and communities; personal stories provide strong campaigning tools that are easily understood by the public and policy-makers (IPPNW, n.d.). Moreover, research on the human and financial costs of interpersonal injuries can provide civil society campaigns with credible evidence in support of preventive interventions.

While this study highlights the utility of hospital data, record-keeping standards remain inadequate in Liberia. At this writing, the country's hospitals were not engaged in the routine, systematic collection of interpersonal injury data. As discussed, the data that was being recorded varied across records, which were often incomplete, indicating an urgent need for better record-keeping and record storage.

It should also be borne in mind that even relatively complete hospital—and other—data is likely to underestimate the burden of interpersonal injuries in a population, as a certain number are never reported to hospitals or to the authorities. Such may be the case if injured persons are too severely or too lightly wounded to seek assistance, or if they cannot access transport to reach assistance.

Enhancing the effectiveness of data collection in Liberia

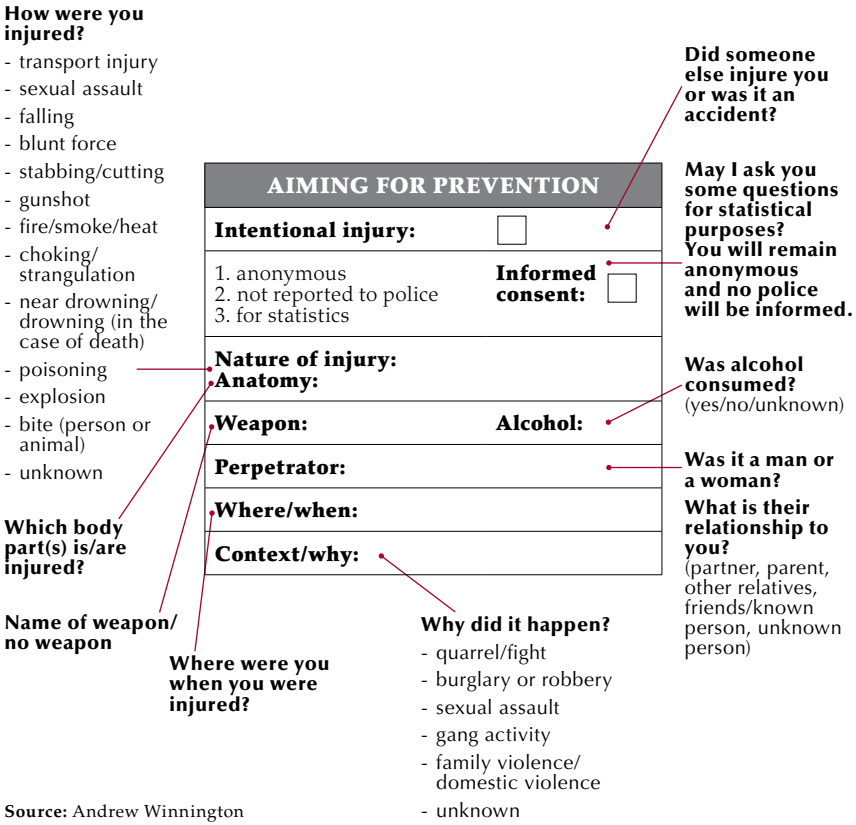
While stressing the need for systematized record-keeping practices in hospitals, this Working Paper calls attention to the value of quality hospital data on interpersonal injuries in the context of informing and designing violence reduction policies and interventions. Given that the LAVO injury surveillance model is likely to be replicated in other West African countries, enhancing the flow of quality data from hospitals to LAVO can also be expected to maximize the effectiveness of future observatories in the region. In that sense, this study—and the following points—can serve to support not only the Liberian government in meeting international obligations on reducing armed violence and promoting peace and disarmament, but also its neighbours.

Adhesive data collection tool. Based on previous work by IPPNW, one of the authors of this report developed a data collection tool for use by Liberian ED hospital staff members who saw injured patients in September 2011 (Zavala et al., 2007). The aim of the tool was to improve the quantity and quality of interpersonal injury data collected by hospital staff and, in turn, to enhance the quantity and quality of data provided to LAVO. The tool is a sticker that can easily be applied to pages (see Figure 11).

Simple and quick to use, the tool creates a space to ask injured patients questions regarding a recent incident while collecting standard patient history data. It is to be used once the patient's condition has stabilized, so as to avoid delaying patient treatment or obstructing ED activities. ED staff can place a sticker on a page in the patient file where information regarding the injury would be documented anyway. The sticker also makes injury cases easier to identify among medical records.

While use of the tool was never formally implemented beyond the purposes of this study, LAVO and hospital staff could be trained or retrained to employ it. In emergency departments, selected staff members could lead the

Figure 11 **The IPPNW data collection tool**



Source: Andrew Winnington

implementation process, supported by training manuals designed for clinical and hospital records staff. Ideally, a LAVO member would be nominated to oversee the implementation of the tool in hospitals and to provide relevant leadership and continuity.

Staff members who are treating patients for violence-related injuries and are interested in improving the tool are welcome to refer to the *Manual for Estimating the Economic Costs of Injuries Due to Interpersonal and Self-directed Violence* (Butchart et al., 2008). The authors of this Working Paper are open to suggestions from LAVO and hospital staff regarding the sticker design and use.

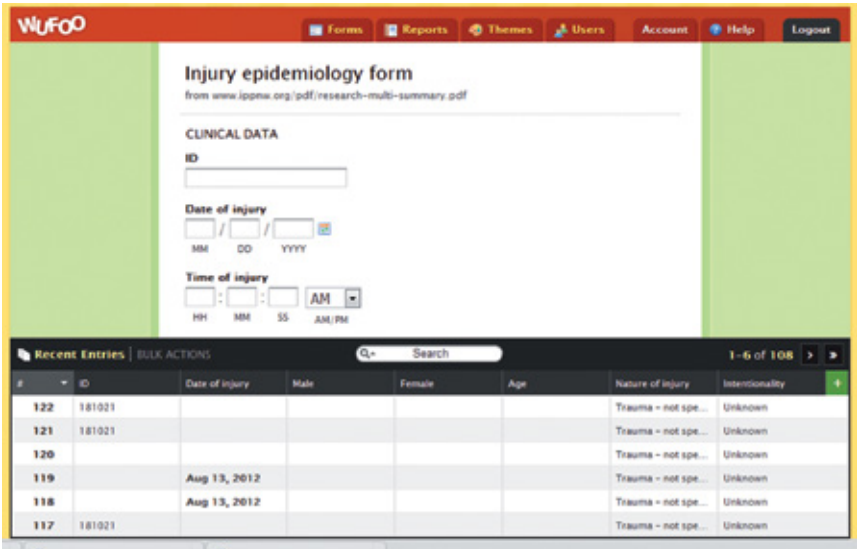
Electronic data collection tools. To enhance the organization of data on interpersonal injuries and facilitate its transfer to LAVO, hospital staff could make use of computers available in each hospital to collect and store data. This practice would also help in the production and dissemination of monthly statistics for the Ministry of Health and Social Welfare on all attendances. At this writing, only one hospital in Liberia reportedly had an electronic admissions form, while others recorded data manually (see Photo 6).

Photo 6 Medical record clerk's desk in the medical records room at Redemption.
Source: Lucie Collinson

Hospitals in Liberia could use an online survey developed by IPPNW to collect data on injuries (see Figure 12). Medical data can also be collected via handheld devices, including smart phones; such an approach could be explored as a low-cost way of integrating more comprehensive data collection practices.

Capacity building. An important objective of this research project was to build the capacity of health professionals and researchers in Liberia to measure and monitor levels of interpersonal and armed violence. Building

Figure 12 **First page of injury epidemiology data collection form developed by IPPNW staff for online use**



Source: IPPNW

networks and cultivating collaborations are key to the successful implementation of the data collection tools such as the sticker, as well as to gaining future access to other hospitals and maintaining access to Redemption and St. Joseph's.

The authors of this study developed the data collection tool and the two training manuals in 2011, while teaching both clinical and medical records staff how to use the tool. Subsequently, they ran a training session for LAVO staff on how to use the stickers and provided the Observatory with a large number of stickers. Upon returning to Monrovia in August 2012, the authors held further meetings with staff at LAVO, the Ministry of Health and Social Welfare, the University of Liberia, and the John F. Kennedy Memorial Medical Centre. They also provided each institution with copies of the study's ethics application, which describes the background to the project and preliminary

results from the initial visit in September 2011. The authors have discussed possibilities for future collaboration with hospital staff.[4]

Triage nurses and registration clerks—who are generally involved in keeping records on emergency cases—are candidates for advanced training in data collection methods. Other potential candidates include LAVO staff, staff and students at the medical and nursing schools, ED staff, and medical records officers.

WHO injury data collection course: TEACH-VIP. WHO provides a free online data collection course (WHO, n.d.). All the preparatory documents for the course are available on the website. LAVO staff members may find it beneficial to review the course contents and perhaps use parts of it to raise awareness on the importance of high-quality data collection by clinical staff in hospitals.

Using patient files as data sources. Should it be impossible to implement the data collection tool, LAVO staff could request hospital staff to submit data on interpersonal injuries from patient files as well as ED attendance registers. As described above, patient files provide significantly more information on injuries than do registers.

Expanding the scope of data collection. Observatories could usefully expand data collection to include all types of interpersonal and self-directed violence, rather than armed violence alone. In this way, they would be able to capture data on violence that is perpetrated without weapons, including some sexual assaults and unarmed assaults. Observatories could also expand their data collection to allow for economic analyses of the direct and indirect costs of interpersonal injuries.

Medical ethics approval. LAVO could apply for ethics approval to collect and use medical data from John F. Kennedy Memorial Medical Centre and the other hospitals in Liberia.

Augment monthly data collection. LAVO could request space to record intentional injuries—both interpersonal and self-inflicted—and injuries from armed violence as separate entities alongside 'all injuries' on the data collection sheets that are prepared for the monthly hospital reports to the Ministry of Health and Social Welfare.

Hospital liaison for injury surveillance. A member of LAVO's staff could be designated as a hospital liaison to build sustainable relationships with hospital staff, act as a point of contact, and provide continuity. The liaison could encourage the use of tools and raise awareness of their importance as well as the value of providing data to LAVO.

Future research. Future studies could use the capture–recapture method to quantify levels of armed violence in Liberia, as outlined by Hook and Regal (1995). This approach could serve as a way to investigate discrepancies between different sources that provide LAVO with data on interpersonal injuries.

Glossary

Note to the reader

Each hospital collects data and records things slightly differently in Monrovia. Redemption and St. Joseph's do not have matching terminology for their records.

Redemption has five types of medical records: ED attendance registers, patient files, admissions registers, inpatient notes, and monthly patient attendance records for the Ministry of Health and Social Welfare.

Redemption documents initial demographic details and reasons for attendance of patients attending the emergency department (ED) on an **ED attendance register.** More detailed clinical information for those attending ED is then recorded in **patient files.** Basic demographic details of patients admitted to hospital for a minimum of an overnight stay are recorded on **admissions registers** and then more detailed clinical information in **inpatient notes.** Redemption also prepares **monthly patient attendance records** for the Ministry of Health and Social Welfare containing information on the types of hospital attendances and admissions (see 'Research methods', pp. 31-34).

St. Joseph's has four types of medical records: ED attendance patient notes, admissions registers, inpatient files, and monthly patient attendance records for the Ministry of Health and Social Welfare. (Note: St. Joseph's does not have patient files; it does have patient notes.)

St. Joseph's records initial demographic details and reasons for attendance of patients attending the emergency department as well as more detailed clinical information in **ED attendance patient notes.** Basic demographic details of patients admitted to hospital for a minimum of an overnight stay are recorded on **admissions registers** and then more detailed clinical information for these admissions in **inpatient files.** St. Joseph's also prepares **monthly patient attendance records** for the Ministry of Health

and Social Welfare containing information on types of hospital attendances and admissions (see 'Research methods', pp. 31-34).

In other words, St. Joseph's did not have an ED attendance register like Redemption's. Instead St. Joseph's had books of ED notes recording more detail on each patient attending ED than a register would. These ED notes are not dissimilar to inpatient files in terms of the data they collect.

Glossary entries

admissions registers

These records are completed by medical records staff to document which patients attending the hospital are admitted to a ward for at least one night's stay.

Redemption

Admissions registers list the date of admission and length of stay as an inpatient; the patient's sex, age, and type of injury; and the patient ID number assigned by the hospital.

St. Joseph's

Admissions registers list the date of admission and length of stay as an inpatient; the patient's sex and age; and diagnoses as well as the means of injury, if applicable.

armed violence

'The intentional use of illegitimate force (actual or threatened) with arms or explosives, against a person, group, community, or state, that undermines people-centred security or sustainable development' (Geneva Declaration Secretariat, 2008, p. 2). (It can be argued, however, that certain armed violence is not intentional, if a weapon is fired or detonates accidentally, for example.)

attendance

Interaction with the patient when he or she visits the hospital, but is not yet formally admitted. The patient in attendance is termed outpatient. In certain circumstances (such as a late-night emergency visit), the patient may be kept overnight and observed, but not admitted formally as an inpatient. Depending on this observation, if the patient is then formally admitted (rather than discharged from the hospital), his or her status would then change from outpatient to inpatient.

ED attendance registers/notes

Redemption

ED attendance registers contain information such as the date of attendance; the patient's sex, age, and injury; and a patient ID number, assigned by the hospital at admission.

St. Joseph's

The St. Joseph's ED patient attendance notes contain information such as the date and time of attendance (details as to whether the patient was admitted); the patient's sex, age, occupation, and location of incident; diagnoses, treatment, test results, imaging, and associated costs; and information about the injury, such as its anatomical location, intentionality, and the means of injury; perpetrator details; and follow-up needed or investigations.

injury

The physical damage that results when a human body is suddenly or briefly subjected to intolerable levels of energy. The energy that causes an injury may be mechanical, such as the impact with a moving or stationary object, including a surface, knife, or vehicle; radiant, such as blinding light or a shock wave from an explosion; thermal, such as air or water that is too hot or too cold; electrical; or chemical, such as a poison or an intoxicating or mind-altering substance, including alcohol or a drug (Holder et al., 2001, p. 5).

inpatient

A patient who is admitted to stay in a hospital until they have completed their medical treatment.

inpatient notes/files

Redemption

Inpatient notes (for patients admitted to hospital for at least one night) include the patient ID; dates of admission and discharge; the patient's sex, age, occupation, and location of incident; diagnoses, treatment, test results, imaging, information about the injury, such as its anatomical location, severity, intentionality, the circumstances and means of injury; perpetrator details; the type of weapon used to inflict the injury, if applicable; and information about the incident, such as whether alcohol was involved and the relationship of the perpetrator to the victim.

St. Joseph's

Inpatient files (for patients admitted to hospital for at least one night) include the patient ID; dates of admission and discharge; the patient's sex, age, occupation, and location of incident; diagnoses, treatment, test results, imaging, and associated costs; information about the injury, such as its anatomical location, severity, intentionality, and the circumstances and means of injury; perpetrator details; the type of weapon used to inflict the injury, if applicable; and information about the incident, such as whether alcohol was involved and the relationship of the perpetrator to the victim. A distinguishing feature of inpatient files at St. Joseph's is that they provide costing information regarding treatment, the number of procedures and medication, and the length of stay, although such details were not available for every patient.

intentional injury

Any physical injury that does not result from an accident and which can be self-directed (committed against oneself) or against another person or other people. The term can be used interchangeably with assault, implying a physical attack (upon oneself or another) has taken place.

interpersonal injury

Any physical injury committed by one or more persons against another person or more than one person. Interpersonal injury can be intentional or accidental. It does not include self-directed injury.

monthly patient attendance records

Redemption and St. Joseph's

For both hospitals, monthly patient attendance records are prepared for the Ministry of Health and Social Welfare. They include information on both outpatient attendances and patients admitted as inpatients.

non-transport-related injury

Any injury recorded that does not involve vehicles, traffic, or a road accident. It does not indicate intentionality of injury, as some non-transport-related injuries can be accidental.

outpatient

A patient who receives treatment at a hospital, as in an emergency room or clinic, but is not admitted as an inpatient to receive their medical treatment. (Inpatients, by contrast, are usually kept in for a minimum of one night.)

patient files

Redemption

Patient files include the date of admission; the patient's sex and age; the patient ID; details on the injury, such as its anatomical location, severity, and intentionality; the type of weapon used to inflict the injury, if applicable; and information about the incident, such as whether alcohol was involved and the relationship of the perpetrator to the victim. Patient files at Redemption are for patients attending ED.

St. Joseph's

St. Joseph's does not have patient files.

transport-related injury

The injury involved a vehicle made and used for conveying persons and goods. It can also be referred to as a motor-vehicle injury, and encompasses many types of injury situations, such as involving more than one vehicle or different types of vehicles. The person involved can be a driver, a passenger, a pedestrian, a cyclist, a motorcyclist, or a passer-by.

violence

'The intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, which either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation.' This definition encompasses interpersonal violence, as well as suicidal behaviour and armed conflict (WHO, 2002, p. 4).

Endnotes

1 Author interview with a staff member and review of medical records submitted to the Ministry of Health and Social Welfare, Redemption Hospital, August 2012.

2 Author interview with a staff member, St. Joseph's Catholic Hospital, August 2012.

3 In the absence of evidence, this apparent trend could be linked to the impact of Liberia's disarmament, demobilization, rehabilitation, and reintegration programme, which saw the collection of more than 20,000 weapons and more than 5 million rounds of small arms ammunition in 2004 (UNDP, n.d.).

4 Future cooperation has been discussed with Vuyu Golakai, dean of the School of Medicine; Wede Elliot-Brownell, vice president for academic affairs and provost, University of Liberia; and Billy Johnson, chief medical officer at the John F. Kennedy Memorial Medical Centre. Golakai, who specializes in surgery and epidemiology, expressed interest in implementing the use of data collection stickers in each hospital.

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