

Tracking violence in Timor-Leste

A sample of emergency room data, 2006–08

Introduction

Accurate data on the incidence and characteristics of violent injuries can be a powerful tool for understanding and responding to armed violence. Record keeping by hospitals, clinics, and other health facilities on the nature of injuries can provide crucial information on who is being injured, how, where, and under what circumstances. Data is essential for gaining a better understanding of the risk factors for victimization among different segments of the population and for the design of interventions to reduce those risks.

To be most useful for guiding prevention activities, however, injury data should be standardized, detail rich, and collected systematically as part of a public health surveillance system. This in turn requires uniform information management systems, the commitment of personnel time and resources, and motivated stakeholders willing to provide sustained support.

Under an agreement with the Ministry of Health, the Timor-Leste Armed Violence Assessment (TLAVA) was given access to patient data from three hospitals for the years 2006–08. The objectives were to collect and analyse the data in order to identify incidents, trends, and risk factors for armed violence following the 2006 crisis and 2007 unrest, and to assess the state of violent injury surveillance in the country. This study, while subject to limitations and caveats, presents one of the first longitudinal looks at violent victimization as reflected by cases treated at Timorese hospital emergency rooms (ERs).

After manually abstracting patient data from ERs at Dili National Hospital, Maliana Hospital, and Baucau Hospital, and a critical review of hospital record keeping processes, TLAVA finds that:

- Almost half of the injuries (44 per cent) recorded at ERs in Dili and Baucau hospitals from 2006 to 2008 were the result of violence, while 53 per cent were due to traffic accidents.

- The portion of recorded injuries seen at Dili National Hospital attributable to violence fell from 59 per cent in 2006 to 36 per cent in 2008. Injuries caused by weapons associated with urban gang warfare—arrows, knives, and machetes—dropped from 17 per cent to 6 per cent in the same period, and injuries caused by fists, stones, and sticks dropped from 36 per cent to 24 per cent. The portion of recorded injuries attributable to traffic accidents rose from 41 per cent to 57 per cent.
- The portion of recorded injuries seen at Baucau Hospital attributable to violence rose from 34 per cent in 2006 to 48 per cent in 2008, but data coding problems make it difficult to elaborate—or even confirm—this finding. Traffic injuries reportedly dropped from 66 per cent of all cases to 52 per cent in the same period.
- Data from Maliana Hospital had to be excluded from the analysis due to the lack of ER records for 2006 and 2007: in only one-third of all cases could a cause of injury be determined.
- Almost one-fifth of all women presenting at ERs in Dili and Baucau hospitals were recorded as victims of domestic violence; the proportion rose to one-third for women aged 20–39 years.
- Men aged 15–34 years, and especially those aged 20–29 years, appeared to predominate in ER visits for violence, suggesting that this segment of the population is at greatest risk of violent injury.
- ER data is currently not sufficiently robust or systematically recorded to provide a reliable picture of interpersonal violence in Timor-Leste society.

This *Issue Brief* proceeds by providing an overview of the methods and objectives of hospital surveillance for understanding violent injury trends, and describes the current record keeping arrangements. It then reviews the data collected by TLAVA in three hospitals for the period 2006–08. TLAVA data is then compared to that of Dili

National Hospital's statistical unit and to data made available by the UN Integrated Mission in Timor-Leste (UNMIT), which is also conducting ongoing violent injury tracking. The *Issue Brief* concludes with a review of the problems encountered in conducting this research and with a consideration of current challenges to hospital-based surveillance in Timor-Leste, noting the obstacles still to be overcome to achieve consistent, reliable, and timely data collection and dissemination.

Hospital characteristics and procedures

There are six government-operated hospitals in Timor-Leste with a total bed capacity of approximately 500.¹ The Dili Hospital Nacional Guido Valadares (henceforth Dili Hospital), with 264 beds, is the best equipped. The five regional hospitals, each based in district headquarters—Baucau, Maliana, Oecussi, Suai, and Maubisse—feature smaller facilities. All are equipped to provide at least basic surgical care. Patients needing urgent care are admitted through the public patient registry or ambulance gate into the ER. ER staff and doctors called in from other departments often determine initial treatment and possible transfer to other units. For violent injuries, this generally means surgical wards.

Hospitals track departmental caseloads and procedures through their own statistical systems. These vary with the size and complexity of the hospitals. Dili Hospital has developed a differentiated statistical unit with four full-time staff members. In Baucau Hospital, the second-largest facility (114 beds), the medical records officer sees to statistical tasks. In Maliana Hospital (24 beds), statistical and reporting duties appear to be less clearly differentiated from other clerical work. The variability is problematic for data collection and comparison, and hampered TLAVA researchers' ability to draw conclusions from across hospitals.

Box 1 What is 'surveillance'?

The term 'surveillance', as applied in the field of public health, refers to the ongoing and systematic collection, analysis, and interpretation of health information.² The goal of injury surveillance—as it is with the surveillance of infectious disease—is to generate reliable data that can be used to inform rapid responses to emerging health crises ('early warning'), and to plan long-term public policy responses.

Critical to the value of surveillance is the standardized categorization and coding of medical conditions presented to health staff. Accurate, standardized coding not only allows comparisons of disease and injury (or death) seen at a particular hospital, but makes aggregation with data from other facilities possible, facilitating the analysis of the health situation of population groups. When collected in a timely and ongoing way and disseminated regularly, pooled data can be used to monitor the incidence of injury characteristics, such as weapons-related injuries, in the population at large. Epidemiological analysis can identify specific risk factors for certain types of injuries among particular segments of the population, such as knife injuries among young men aged 15–24 years.

The tenth update of the World Health Organization's (WHO) International Statistical Classification of Diseases, known as ICD-10, is the international standard diagnostic classification for recording health conditions in individuals who present at ERs, clinics, and other acute care facilities.³

The extent to which patient data in Timor-Leste is digitized varies from one hospital to another. In Dili National Hospital, computers are networked within the statistical unit, but not with other systems. Patient identifiers are manually created at the registration desk or in the ER and do not always travel the full length of an in-patient hospital stay, making it impossible to determine the total number of patients in the hospital system or to effectively track patient treatment. In Baucau Hospital, the individual identification system remains in its infancy. One reason for this is that trauma care is free for most patients and procedures. Without a universal patient billing system, hospitals have no incentive to maintain a complete information record for individual patients.

Some data on patients is contained in the daily reports that the departments create, with handwritten entries on



Baucau ER setting (staged). The attending physician records patient information in a diagnostic form. The ER register book, under the physician's left arm, was the exclusive data source for TLAVA's research.

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photocopied templates, which are sent to the statistical unit or records officer. The data is aggregated into summary statistics of caseloads, procedures, and—increasingly—diagnoses. This system has limited capacities to correlate individual patient data, and the data it generates is not normally recorded in a way that facilitates statistical analysis. Notably, TLAVA could find no evidence that hospital statistics even captured the length of patient stays.

The Dili Hospital statistical unit keeps its data in digital spreadsheets, but relational database programs are not yet used. The Baucau Hospital records officer has started transferring handwritten report information to digital spreadsheets, but TLAVA has no information on the progress of computerization in the remaining hospitals. This meant that the TLAVA data collectors had to extract data from the manual information bases—essentially the admissions book—of the ERs. The practical and conceptual challenges this presented are discussed on pages 5–6.

Data collected

To access data on injured patients treated by Timor-Leste hospitals, two TLAVA data collectors worked at three hospitals during the period September 2008 through June 2009. Their access to hospital documentation and patient data was initially negotiated with the Ministry of Health, the hospital management, and, in Dili National Hospital, with the statistical unit. Practically, the data collectors carried out most of their work in the ERs. To a lesser degree, they interacted with staff of the male surgical ward in Dili National Hospital.

TLAVA researchers transferred data on over 2,600 ER patients to spreadsheets. The initial objective was to analyse injury data for the entire 36-month period of January 2006 to December 2008. The team began by abstracting the data for the months of June, July, and August each year, in order to make rapid comparisons between the events surrounding the crisis of 2006 and the unrest of 2007—both of which took place in the summer months—and the relatively calm summer period of 2008. The data abstraction process was far more burdensome on TLAVA and hospital staff than anticipated, however, and plans to backfill the intervening months had to be abandoned.⁴

In addition, it quickly became clear that the statistical and records offices in the hospitals were either marginal (Baucau, Maliana), did not hold individual patient data (statistical unit in Dili), or did not do statistics at all (records office in Dili). As a result, TLAVA data collectors fell back on primary data sources, i.e. ER register entries. The TLAVA data thus consisted initially of 2,465 individual trauma patients seen in the ERs of Dili, Maliana, and Baucau hospitals in June–August 2006, 2007, and 2008, after excluding 135 non-injury-related complaints. Some patient files were also consulted, where possible, but this was rarely the case.⁵

As Table 1 indicates, Dili Hospital contributed the majority of the cases abstracted. This is partly due to the fact that Dili had a functioning records office, but also because of administrative challenges elsewhere. For example, Maliana Hospital kept few ER records from the years 2006 and 2007 that the TLAVA data collectors could locate and extract. Yet in January 2008 some staff members were sent for training

in patient record maintenance. The result is a crop of trauma patient records in Maliana for summer 2008 eight times the size of those in previous periods.

Table 1 ER trauma patients by hospital, June–August 2006–08

Hospital	June–August period of year:			
	2006	2007	2008	Total
Baucau	144	223	179	546
Dili	386	523	555	1,464
Maliana	40	46	369	455
Total	570	792	1,103	2,465

The trauma classification used by the TLAVA data collectors evolved over time, mirroring categories used by the Dili Hospital statistical unit and extrapolating from free-form diagnosis and cause-of-injury text elements. Early on, an irreversible choice was made of mixing cause of incident and weapons categories. After reclassifying some categories and collapsing rare ones into related categories, the TLAVA team settled on the categorization shown in Table 2.

It must be noted immediately that the mixing of incidents types and weapon types in a one-dimensional category set is analytically inappropriate. For example, a case of domestic violence in which a knife was used cannot be placed in both categories. In such cases, data collectors needed to choose one or the other—and in either case, valuable information is lost. Furthermore, categories varied greatly from hospital to hospital.

Maliana Hospital presented special, insurmountable problems: the data collectors found the ER records to be so sparse that they could make a determination of the incident type in only one-third of all cases. Here, no domestic violence case was recorded as such. While the data may not be representative because of poor record

keeping, the absence of other violence cases and the very low number of people injured with fists, stones, and sticks may suggest that Maliana Hospital did not systematically recognize low-level violence. In any event, the Maliana dataset—18 per cent of the data abstracted for this research—had to be excluded from the substantive findings reported below.

Findings

Of the abstracted injury cases from all three hospitals, almost one-quarter (596 of 2,465) were women and girls. The age distribution ranged from eight months to 95 years, with the median age being 24 years. Out-of-district residents made up nine per cent of the ER trauma cases. Surprisingly, the better-equipped Dili National Hospital saw fewer out-of-district trauma victims (10 per cent) than Baucau Hospital (12 per cent). This may reflect the fact that Baucau is the only hospital for the entire eastern region of Timor-Leste; stronger vehicular traffic growth and more intense political and gang violence in Dili may have also played a part. The Maliana Hospital ER did not tend to receive any trauma patients from outside Bobonaro District. One explanation for this may be that it is situated not far from Maubisse Hospital, which was not included in this study.

Injuries

The following findings are drawn exclusively from Dili and Baucau, as Maliana Hospital data had to be excluded for the reasons noted above. The majority of trauma patients recorded were victims of traffic accidents (53 per cent). Almost half (44 per cent) of the 2,010 cases presenting for trauma were as a result of violent incidents. The proportion of violence victims was only slightly higher in Dili (45 per cent) than in Baucau (42 per cent). Rounding

out the set of abstracted cases, about one per cent of the recorded cases featured individuals unintentionally injured in non-traffic settings. For about two per cent of all trauma patients, the cause of injury remained unknown or unrecorded.

The data collectors assigned the classification ‘domestic violence’ to six per cent of the trauma cases. Another four per cent suffered violence of an unspecified kind. Other violence cases were coded according to the weapon used. Thus, almost a quarter (23 per cent) of all admitted trauma cases had been injured in fights in which bare fists, stones, or sticks were used. Ten per cent of admissions were for wounds inflicted with arrows, knives, spears, and machetes (grouped together in codes). Firearm injuries were recorded for less than one per cent of the trauma patients, but some hospital staff have indicated that some firearm victims stay away from hospitals, resulting in under-reporting.⁶

Trends in violence and weapon use

The composition of the ER trauma patients changed significantly over the three observation periods (see Tables 3 and 4). In Dili National Hospital, the fraction of violence victims fell steadily, from 59 per cent in 2006 to 36 per cent in 2008. This is logical, given the violent political events of 2006, after which the political situation broadly stabilized—despite the March 2007 attacks on the president and prime minister. In parallel, Dili saw a rapid increase in the number of motor vehicles and, with them, an increase in traffic accidents.

Table 3 Violence as a percentage of all trauma cases

June–August	Hospital		
	Baucau	Dili	Combined
2006	34.0%	59.1%	52.3%
2007	41.7%	43.8%	43.1%
2008	48.0%	36.2%	39.1%
Total	41.8%	44.9%	44.1%

These developments cannot explain the evolution of the Baucau Hospital cases, however, where violence *increased* from about one-third to almost one-half the ER trauma load from 2006 to 2008. While the Baucau ER coordinator could note only that domestic violence cases—particularly wives injured with machetes—remained frequent, the data points to a worsening trend for violence generally. Teasing out the nature of the increase is challenging because of the conflation of injury- and weapons-type coding. While the proportion of female victims coded in either the ‘domestic violence’ or ‘arrows/knives/machetes’

Table 2 ER trauma patients by incident type and hospital (Baucau, Dili, Maliana), aggregate 2006–08

Type of incident	Hospital						Totals	
	Baucau		Dili		Maliana			
	N	%	N	%	N	%	N	%
Traffic accident	318	58	743	51	113	25	1,174	48
Other accidents	0	0	24	2	10	2	34	1
Domestic violence	30	5	95	6	0	0	125	5
Other violence	65	12	18	1	0	0	83	3
Fists/stones/sticks	64	12	400	27	3	<1	467	19
Arrows/knives/machetes	58	11	140	10	25	5	223	9
Firearms	11	2	5	<1	0	0	16	<1
Unknown	0	0	39	3	304	67	343	14
Total	546	100	1,464	100	455	100	2,465	100

Table 4 ER trauma patients by incident type and hospital, 2006–08 (Baucau and Dili)

TYPE OF INCIDENT		BAUCAU			DILI			TOTAL
		2006	2007	2008	2006	2007	2008	
Traffic accident	Cases	95	130	93	158	270	315	1,061
	%	66.0	58.3	52.0	40.9	51.6	56.8	52.8
Other accidents	Cases	0	0	0	0	6	18	24
	%	0.0	0.0	0.0	0.0	1.2	3.2	1.2
Domestic violence	Cases	8	12	10	21	43	31	125
	%	5.6	5.4	5.6	5.4	8.2	5.6	6.2
Other violence	Cases	17	24	24	1	10	7	83
	%	11.8	10.8	13.4	0.3	1.9	1.3	4.1
Fists/stones/sticks	Cases	4	32	28	137	131	132	464
	%	2.8	14.4	15.6	35.5	25.1	23.8	23.1
Arrows/knives/ machetes	Cases	19	21	18	67	42	31	198
	%	13.2	9.4	10.1	17.4	8.0	5.6	9.9
Firearms	Cases	1	4	6	2	3	0	16
	%	0.7	1.8	3.4	0.5	0.6	0.0	0.8
Unknown	Cases	0	0	0	0	18	21	39
	%	0.0	0.0	0.0	0.0	3.4	3.8	1.9
Total	Cases	144	223	179	386	523	555	2,010
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0

categories increased slightly from 2006 to 2008, much more significant was the sevenfold increase in cases of lightly armed fighting ('fists/stones/sticks'). There is at least one observation that may suggest that the 2006 data for this category for Baucau Hospital is an anomaly: the portion of patients seen for arrow, knife, and machete injuries in 2006 was about the same in both Baucau (13 per cent) and Dili (17 per cent). Thus, the causes of a trend in Baucau—if it is real—remain unexplained.

Trends in weapon use are more readily discernable in the data from Dili Hospital (see Figure 1). Lightly armed violence cases remained the major category and remained almost steady (137 in 2006; 132 two years later). The use of arrows, knives, and machetes—the stock-in-trade weapons of urban gangs—dropped considerably, from 67 to 31 patients. No firearms victims were recorded in Dili Hospital in 2006. Gunshot wound victims may have died or avoided hospitals and received treatment elsewhere

Age as a risk factor for men and women

Given problems of data coding, identifying risk factors for the population is challenging. One exception is for specific age groups for men and women. Figure 2 presents violent injuries for males by five-year age cohort. It shows that from age 15 to 39 years, males are highly over-represented in trauma hospitals—especially in the 20–24 age group—compared to other age groups within the population. Similarly, males aged 20–34 years are at increased risk of accident-related trauma (not shown here). Population data comes from the 2004 national census.⁷

The age distribution of female violence victims examined is somewhat flatter than that for males, but with elevated risk in the 20–29 years age group. This group includes newly married women—potential primary victims of domestic violence—and young women who were possible victims of sexual violence. The absolute number of female violence victims is about one-third that

of men (211 females vs 675 males). For accident-related trauma patients (most due to motor vehicle accidents) and those of unknown cause, females aged 15–24 years represent the most elevated risk.

Almost one-fifth (19 per cent) of all women visiting ERs in Dili and Baucau were coded as domestic violence victims (87 of 453 cases). The highest risk age groups were 20–24 and 25–39 years, in which the percentages of injuries attributable to domestic violence were 29 per cent and 32 per cent, respectively. The number of cases of domestic violence increases in 2007, slightly in Baucau and more dramatically in Dili, before dropping again in 2008.

Comparisons with other data sources

Dili Hospital statistical unit

In 2006 and 2007 the statistical unit of Dili Hospital produced, as part of its monthly reports, tables of accident- and violence-related trauma patients. The counts were disaggregated according to gender and cause (see Figure 3). The data for the second half of 2007 was unfortunately lost due to a computer virus attack at the hospital statistical unit. Since 2008 some violence statistics have been appended in a less systematic way in monthly spreadsheets of patient flow data.

While informative, the data presents a number of questions. The violence associated with the 2006 crisis is documented to have taken place between the end of April and the end of June. But according to Dili Hospital data, after an initial surge in trauma load in May, the number of trauma cases—both violence and traffic related—dropped by 50 per cent.

The chaos and fear surrounding the crisis may partly explain this. Many victims did not give their real names, or gave different names at different points of treatment, and sometimes self-discharged in the middle of the night. Anecdotally, many violence victims claimed to have been accident victims. Furthermore, access to the hospital may have been dangerous until autumn, and many of the injured are said to have sought emergency treatment in local clinics that did not require them to cross lines of hostilities. In 2006 the hospital staff learned not to ask too many questions of injured patients and their anxious entourages. As a result, data on patients' residence is less complete for the Dili records than elsewhere.

The erratic oscillations in the gender ratio of victims are also suspicious. If accurate, the low representation of male victims from

Figure 1 Intentional injuries vs traffic accident injuries, Dili Hospital, 2006–08

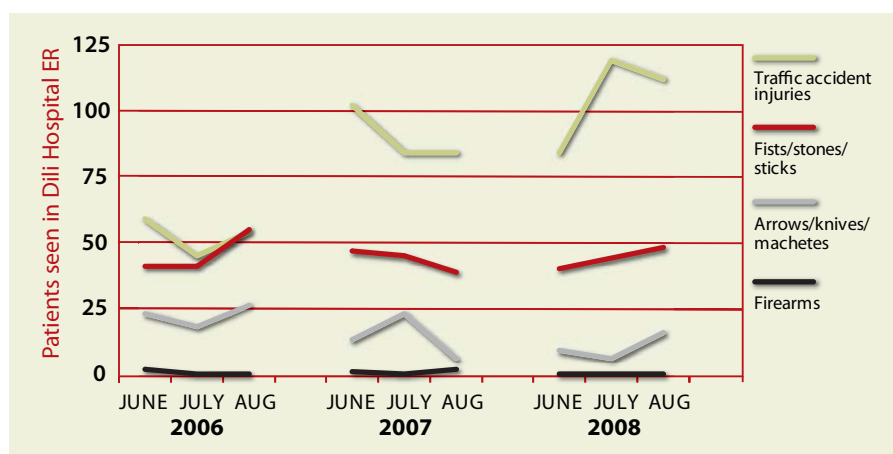


Figure 2 Age distribution of male violence victims, 2006–08, and 2004 male population distributions



Figure 3 Trauma patient data compiled by Dili Hospital, January 2006–June 2007

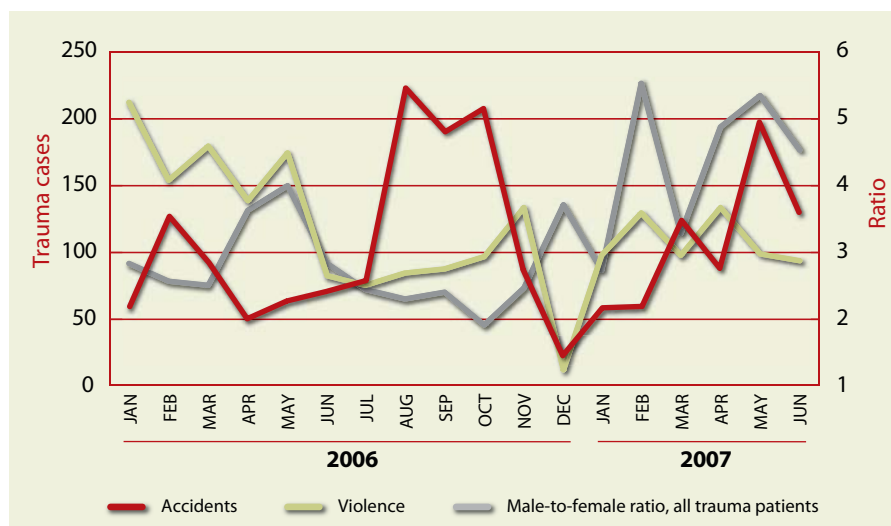
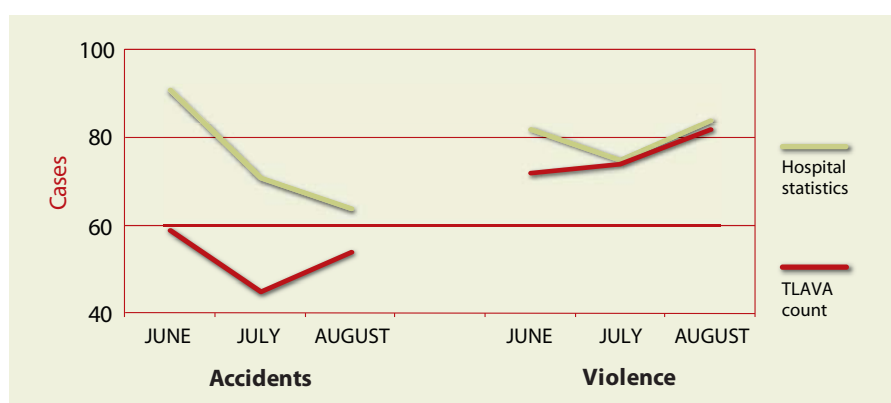


Figure 4 Comparison between Dili National Hospital statistics and TLAVA data, June–August 2006



April through July 2006 could be because they feared being intercepted by hostile groups en route to the hospital, followed by a pent-up demand for trauma services once tension in Dili abated. However, starting in December 2006, the pattern of anomalies appears to be more closely related to data management issues. The statistical unit did not report a single violence victim for

that month. The peak in reported accident victims in February 2007 may be the result of incorrect accounting of January or March cases. Again, the gender ratio changes dramatically during the six months for which data is available in 2007.

The hospital's efforts to put a statistical stamp on the fast-changing realities

illustrate some of the difficulties of hospital-based surveillance. They also limit the usefulness of comparisons with the TLAVA data. In retrospect, the decision to select the period June through August in each year is less than ideal, given the known dynamics of the 2006 and 2007 political events. For 2006, where a comparison is possible, TLAVA violence counts closely matched the hospital figures. For accidents, TLAVA extracted significantly fewer cases (see Figure 4).

UNMIT

In response to the crisis of 2006, UNMIT launched its own national violent incident monitoring system in late 2007, based on incidents recorded by police and armed forces. UNMIT staff considered the weekly incident tallies to be somewhat complete from March 2008 onward.⁸ Although TLAVA was unable to access the basic incident records, UNMIT gave a public presentation detailing monthly incident totals for the period January 2007 through October 2008, which TLAVA obtained.

UNMIT's reported trends do not match TLAVA's counts of violence victims seen in the Dili and Baucau hospitals during 2007 and 2008. In 2007 a wave of arson attacks, following elections in July and the announcement of a new government on 6 August, sent the UNMIT count soaring. Assaults increased slightly. Although civil unrest engulfed both Dili and Baucau, ER patient counts from these hospitals do not reflect this. During 2008 the increase in UNMIT-reported incidents was much slower. The TLAVA count of violence victims treated in the hospitals only notes a small increase for August 2008.

As was true of the Dili National Hospital statistical unit and of the TLAVA data collection, UNMIT too made changes to its category set during the period of shared data. For example, domestic assault became a distinct category in October 2007. It was used in the last quarter, but then was suspended between January and April 2008. Disorderly behaviour had been included as an incident type since the system was created, but instances were not effectively counted until May 2008. The fluid nature of category systems among TLAVA, UNMIT, and the hospitals alike complicated surveillance.

Challenges encountered

The data collected and presented here, while subject to limitations and caveats, presents one of the first longitudinal looks at violent victimization in Timorese ERs. It represents a sustained process of cooperation between government and civil society, with resources and time committed by both the public and

private sectors. The project demonstrated that quick mobilization, flexible tasking, and reasonably priced manpower can enable partnerships to define and pursue important research goals that otherwise would be unlikely to find sponsors. But it also struggled with the challenges of staff capacities, language, cultural divisions, and other obstacles.

One challenge became clear at the outset, which was that data was not available in a form that could be readily utilized in the project. As a result, TLAVA staff was made responsible for coding ER cases. Because hospital records were unexpectedly incomplete or presented conflicting data, the data collectors were forced to make decisions for which their experience and training did not prepare them. TLAVA staff and hospital statistical workers also changed trauma categories on an ad hoc basis, compromising the utility of the dataset. Some categories, such as traffic accidents, were gradually or suddenly refined, while violence was left undifferentiated. Loss of data and formatting changes in the statistical units frustrated the ability to cross-validate TLAVA results with hospital reports.

TLAVA and hospital statistical workers also had to overcome major language issues. Both sides were made to use templates in English and Portuguese, not the first languages of either the hospital or TLAVA staff, while daily ward reports and register entries were written in an even greater variety of languages. The data collectors' command of English was weak and translation slowed down the collection process. The struggle to translate probably compromised the reliability of some data to an unknown degree. In fact, case determinations, amid conceptual and language ambiguities, absorbed a considerable part of the time and energy of TLAVA workers—and apparently also of their hospital counterparts—for some time before any statistics were produced.

Compounding this was a lack of systematic professional oversight and supervision of the staff, and of integration with other information management projects. For example, TLAVA staff had difficulty getting accepted in Baucau and Maliana hospitals, and they were not able to benefit from improvements in coding and spreadsheet design being implemented in hospital statistics. The latter innovations were geared towards the production of timely and accurate reports on patient flows, procedures, and diagnoses. Neither near-real-time surveillance nor violence was a central concern in the hospitals' routine work.

Overview of hospital data management in Timor-Leste

The cornerstone of injury surveillance is individual record keeping. Unfortunately, none of the three hospitals examined maintains individual-level data. This is lost in the organizational memory, except for painstaking reconstruction from hardcopy records kept, if at all, outside the statistical unit. The major product of the Dili National Hospital statistical unit (and of the Baucau records officer's statistical work) is a monthly report addressed to the hospital director and the Ministry of Health. The report comprises some fifty pages of tables, each the result of a different spreadsheet in which the unit manually compiles data from departmental sources.

The management value of the monthly reports is not immediately clear; in one hospital, staff volunteered that since this reporting was resumed after Timor's independence, they had never received any feedback on it. In fact, as far as TLAVA was able to determine, little comparative use is made of the statistics. We could not discover whether there was more to an annual report than the collection, in one Excel workbook, of monthly and quarterly reports.

Thus, knowledge resides primarily with individual staff rather than in transferable systems. For example, the records officer in Baucau Hospital is locally recognized for his long institutional memory. In Dili, the head of the statistical unit was transferred out of the hospital, and with him left the understanding of some of the codes that he had developed. As a result, his successor could not make sense of the data from that period. Overall, the general appreciation for data collection systems and their utility appeared modest among hospital staff.

This is not for lack of interest. At all levels, from the statistical workers to the director general of the ministry, there is an awareness that the current hospital patient information systems, while basically functional, can and should be improved. However, with a plethora of recovery and development projects straining coordination in the health sector, a number of poorly connected initiatives militate against a unified approach. The statistical workers were anxious primarily to improve their personal computer skills and to support colleagues in other units recently equipped with computers (e.g. the pharmacy), but felt that they were too marginal to be heard on the larger questions of systems design and development. Dili National Hospital was talking with a foreign embassy about

hardware donations, a dialogue of which the hospital support unit in the ministry was not aware. The information specialists in this unit approached information management from a data quality angle and from the necessity of supporting the statistical staff and other information producers with a coherent skills development programme.⁹ In this evolving institutional environment, it was not always clear who was responsible for surveillance-related activities. The statistical and ER staff expressed no explicit surveillance concept.

Coordination and training challenges abound. For example, in spring 2009 the statistical unit in Dili and the records officer in Baucau started coding diagnoses according to WHO's ICD-10 (see Box 1).¹⁰ A significant portion of the cases could not be coded using the coding sheets provided by the ministry, apparently because the options were too limited or in part were not understood. The coders had no personal contact with the authors of the codes or with the consumers of their statistics. Eventually, the director general and the WHO representative put hospital information management reform on hold, pending the arrival of a WHO specialist.¹¹

It should be noted that the Ministry of Health does practice active surveillance for infectious diseases. The line runs almost completely outside the hospital system, from polyclinics through district health coordination offices to the Centre for Communicable Diseases in the ministry. In May 2009 TLAVA learned that districts reported daily on new cases of H1N1, Dengue fever, and the human immunodeficiency virus (HIV). The Baucau Hospital ER coordinator made similar reports if and when such cases presented at the hospital.¹² Horizontal coordination with the district office, in the case of the Baucau ER coordinator at least, was chiefly about Dengue fever cases, which would prompt residential spraying.

Interpersonal violence is not subject to the same surveillance systems in Timor-Leste. While domestic violence may be a growing cause of concern within some government agencies, this has not yet affected observable data collecting and reporting activities. In fact, the ability of researchers and officials to review domestic violence incidents has been blocked by recent changes to the monthly report template, which between 2007 and 2009 shifted from recording the causes of trauma to recording departmental caseloads.

Linguistic and professional fractures that run through the healthcare system complicate matters further. Document

templates are mostly in Bahasa Indonesian or Portuguese. Entries come in several more languages, including, in descending order of prominence, Bahasa, Portuguese, English, Tetun, and Spanish. In addition, international doctors and administrators working in the Timor-Leste healthcare system use their own languages conversationally, including Chinese, Filipino, and Spanish. During the original admission of a patient to hospital, the cause of injury may be stated in the ER register, but this information is not carried through to reports made by ward physicians (who may focus on, for example, a deep cut wound, but not the domestic violence that may have caused the injury). This makes it impossible for the statistical unit to code cases. It is fair to say that, even without consistent patient IDs, departmental caseload statistics are presumably reliable. But nobody can know how many different individuals are cared for by the hospital in total.¹³ This ignorance extends to trauma cases, and thus to our research.

Reflections

Injury surveillance is a public health tool with great potential for informing violence prevention activities. If properly recorded, collated, and analysed, surveillance data can help identify risk factors for specific groups and trends over time, and even monitor the health impacts of public policy initiatives. In countries where public health infrastructure is weak or overburdened, however, the ability of health professionals to record and make use of injury surveillance may be challenging.

TLAVA's analysis of trauma patients appears to confirm a common perception that violence in Dili decreased between 2006 and 2008. The same research, however, suggests that violence in Baucau increased over the same period. Because of problems related to data recording and collection, it is not known if this is reflective of actual violence. Meanwhile, data from Maliana Hospital was insufficiently recorded for substantive results to be drawn. This, at most, is a hint that the smaller provincial hospitals are in the very early stages of building up their patient information capacity.

In fact, in none of the three hospitals examined is public health surveillance properly understood. The process was too slow, with these results coming out almost one year after the end of the last observation period (August 2008). Even if it had been available almost instantly, hospital-based trauma data would not meet the early warning function expected of public health surveillance. As we have seen, in periods

of intense violence, the trauma caseload borne by the hospitals may actually fall. This happens when the people caring for the injured decide against taking them to hospitals, or when service capacity plummets.

Moreover, trauma statistics are a minor by-product of hospital information management in Timor-Leste. Capacity development efforts are being pursued by a number of groups scattered across hospitals, the Ministry of Health, and the WHO country office, but these groups are weakly coordinated among themselves. TLAVA, during its engagement, was able to build significant rapport only with one of the less influential groups, the statistical unit in Dili Hospital. Nothing indicated that efforts at stronger information management had a surveillance focus, let alone one on violence. The public health surveillance lines that the ministry has set up are largely running outside the hospitals. In addition, community-based surveillance of conflict and violence is being promoted in a partnership between the government and the national NGO Belun.¹⁴ This arrangement is supposed to respond to risks of armed violence much more rapidly than hospitals are equipped to do.

Timor-Leste earned plaudits for the speedy and effective way in which health system leadership was transferred, soon after independence, from international NGOs to the government. Improved health information systems have been on the agenda of the Ministry of Health continuously since then.¹⁵ Despite this progress, the needs in this area are still vast. Whatever the intent and shape of information systems created or reformed in the hospitals, there is a need to reinforce elementary data management skills, as well as design and implement the kinds of formats, tools, and procedures that the available workforce will understand.

Moving public health surveillance for trauma forward in Timor-Leste will require investment in common conceptual and operational foundations. At a minimum, the patient identifiers need to be standardized across contexts—e.g. from police reports to ER records to court documents—as a precondition for relating attributes from one context to those of others. Equally, basic data entry and software skills are needed at several nodes of collaboration if the information produced is to be valid and reliable.

Surveillance must be driven by a strong stakeholder coalition, and making the surveillance system sustainable will require attracting and engaging these stakeholders. Given how few firearm victims are treated in

the hospitals, TLAVA's concern with armed violence is unlikely to supply a unique focus. Other related social problems may generate stronger and more continuous collaboration with the hospitals, as well as more coherent attention to the data produced there. A case may be made to have the hospitals participate not in one, but in several thematically distinct surveillance networks. Hospitals are already connected, although apparently on the margins, to contagious disease surveillance. Another candidate focus is domestic and sexual violence, which has a strong network of concerned organizations, including, but not limited to, hospitals.¹⁶ While each prominent focus may benefit from one driving organization coordinating its kindred network partners, the technical side of surveillance will require patient and humble work on the basics. The natural leader for this is the Ministry of Health, assisted by the partners that it considers appropriate for the task.

In the final analysis, TLAVA partnered with organizations that provide vital services to victims of armed violence, but do not yet fill a prominent role in violence surveillance. Moreover, selective admissions during peak periods of political unrest suggest that trauma caseloads, viewed in isolation, are not sufficient instruments of surveillance.

Yet violence research in hospitals has value for effective health information management. If hospital statistical workers can be helped to piece together the trajectories of trauma patients through the health system, their data management controls should be able to handle individual patient-based data for the entire hospital population. As TLAVA came to understand during nearly nine months of working in hospitals, a more sophisticated system will require progress on two fronts: skills and systems to integrate data across hospital units, and a viable coalition of concerned partners wanting to use this information in addressing important societal issues.

Notes

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- 1 A study of five out of the six hospitals calculated the total beds at 450 in 2007 (Ministry of Health and Netherlands Royal Tropical Institute, 2008, p. iv). Data for the sixth hospital (Maubisse) was not reported.
- 2 WHO (2001), p. 11. The full WHO definition reads: 'Surveillance is the ongoing, systematic collection, analysis and interpretation of health data essential to the planning, implementation, and evaluation of health practice, closely integrated with the timely dissemination of these data to those who need to know. The

final link of the surveillance chain is in the application of these data to prevention and control. A surveillance system includes a functional capacity for data collection, analysis and dissemination linked to public health programs.'

- 3 WHO (2003).
- 4 A planned violent injury costing exercise also had to be abandoned when it became clear that it was not feasible to correlate surgical ward patient data with ER records. The labour-intensive work succeeded in correlating only 41 cases.
- 5 Locating and in some cases reviewing patient files required the cooperation of busy hospital workers, which could not be sustained over the period of the study. As a result, data was increasingly abstracted from registers only.
- 6 TLAVA interview with ER head, Dili Hospital, Dili, 18 May 2009.
- 7 As a national distribution, the value of the national census data is limited: due to the migration of young men to urban centres, the Dili and Baucau populations must have a higher proportion of this group than the national average. Regardless of the (unknown) adjustments for migration, the age distribution of the male violence patients clearly shows a high concentration in the age range 15–34 years. Exposure to violence is the strongest for this age group.
- 8 TLAVA interviews conducted at UNMIT Joint Mission Analysis Centre, Dili, 15 May 2009.
- 9 TLAVA interviews with Ministry of Health personnel, Dili, 26 May 2008.
- 10 WHO (2003).
- 11 TLAVA interviews with the director general of the Ministry of Health and the acting director of the WHO in Timor-Leste, Dili, 26 May 2009.
- 12 TLAVA interview with ER head, Baucau Hospital, Baucau, 25 May 2009.
- 13 A problem often encountered in healthcare information systems; e.g. see Padiani et al. (2002).
- 14 TLAVA interview with Belun Policy and Research Associated, Dili, 19 May 2009.
- 15 Alonso and Brugha (2006), p. 212.

16 The Office of the Secretary of State for the Promotion of Equality, previously known as the Office for the Promotion of Equality, takes a strong interest in domestic violence. It promotes the expansion of hospital-based safe spaces for victims, not only in Dili, but also in the regions. With a seat on the Council of Ministers, this body wields considerable power and could well spearhead domestic violence-focused surveillance (AusAID, 2008, p. 25). Since 2002, one such shelter facility has been operated within Dili Hospital by the NGO PRADET.

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Briefing Papers

Parker, Sarah. 2008. 'Commentary on the Draft Arms Law in Timor-Leste.' *East Timor Law Journal*. Available online in English, Tetum, Indonesian, and Portuguese. <<http://www.easttimorlawjournal.org/Articles/Index.html>>

Issue Briefs

- Number 1, October 2008
Dealing with the kilat: an historical overview of small arms availability and arms control in Timor-Leste
- Number 2, April 2009
Groups, gangs, and armed violence in Timor-Leste
- Number 3, June 2009
Electoral violence in Timor-Leste: mapping incidents and responses

TLAVA project summary

The Timor-Leste Armed Violence Assessment (TLAVA) is an independent research project overseen by ActionAid Australia (formerly Austcare) and the Small Arms Survey. Designed in consultation with public and non-governmental partners, the project seeks to identify and disseminate concrete entry points to prevent and reduce real and perceived armed violence in Timor-Leste. The project functions as a Dili-based repository of international and domestic data on violence trends. From 2008 to 2010, the TLAVA is to serve as a clearinghouse for information and analysis with specific focus on:

- the risk factors, impacts, and socioeconomic costs of armed violence in relation to population health—particularly women, children and male youth, and internally displaced people;
- the dynamics of armed violence associated with 'high-risk' groups such as gangs, specific communities in affected districts, petitioners, veterans, state institutions, and potential triggers such as elections; and
- the availability and misuse of arms (e.g. bladed, home-made, or 'craft' manufactured) as a factor contributing to armed violence and routine insecurity.

The project's objective is to provide valid evidence-based policy options to reduce armed violence for the Timorese government, civil society, and their partners. The project draws on a combination of methods—from public health surveillance to focus group and interview-based research—to identify appropriate priorities and practical strategies. Findings are released in Tetum and English. TLAVA *Issue Briefs* provide timely reports on important aspects of armed violence in Timor-Leste, including the availability and distribution of small arms and craft weapons and election-related violence.



The project is supported by Australian Agency for International Development (AusAID).

Credits

Design: Go Media Design
Editorial support: Emile LeBrun, Robert Muggah, Celia Paoloni, and Lyn Wan

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