Contaminated Sharps Injuries Among Healthcare Workers in Texas: 2012

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TEXAS Department of State Health Services

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Background

Public Health Significance

The transmission of bloodborne pathogens through contaminated sharps injuries represents a significant public health issue. It is estimated that close to 385,000 of these injuries occur annually in the United States (US) in hospitals alone, and medical services rendered outside of hospitals are thought to account for significantly more (CDC, 2008). Pathogens including hepatitis B virus (HBV), hepatitis C virus (HCV), and the human immunodeficiency virus (HIV) may be transmitted through blood and other potentially infectious materials in the healthcare setting. Costs associated with exposure incidents such as lab tests, evaluations, immediate and long-term treatments, employee time lost, and anxiety of exposed workers represent a mostly preventable burden on healthcare systems. An investigation of exposure costs in which four hospitals were presented with hypothetical exposure scenarios revealed costs as high as $3,042 per incident; even when the source individuals were determined to be free of infection, hospitals still spent $376 per incident on testing (O'Malley, 2007).

Regulation, Reporting, and Policy Implementation

With exposure associated expenses and the health risks to providers and patients in mind, federal and state regulators and professional organizations sought to reduce the rate of injuries involving contaminated sharps. Reduction efforts began with the release of Centers for Disease Control and Prevention (CDC) guidelines that urged caution when interacting with patients, regardless of if they harbored a transmissible disease. Shortly afterwards the Occupational Safety and Health Administration (OSHA) developed regulations that require employee education and training on bloodborne pathogen precautions, safety practices, compliance measures, and the implementation of safety engineered devices (OSHA, 2011). In 2001, following the enactment of the federal "Needlestick Prevention and Safety Act of 2000", OSHA updated its bloodborne pathogen regulations to include provisions mandating the reporting of contaminated sharps injuries and that employers maintain sharps injury records (OSHA, n.d.). Currently 25 states have implemented OSHA's safety regulations. Facilities that operate within these states are eligible for up to 50% of the costs associated with the implementation of their safety plans (OSHA, 2010). Texas has not subscribed to OSHA standards. This means governmental entities, such as publicly funded hospitals and clinics,

are not required to adhere to OSHA regulations. Texas has instead adopted, by statute, regulation to cover these facilities that mirrors OSHA's standard, notably implementation of safe workplace practices, use of safety engineered devices, exposure protocols, and reporting measures in the Texas Administrative Code (TAC) (25 TAC § 96, 2006; Texas Department of State Health Services, 2011).

Public health policy in Texas is carried out by local and regional health departments (Texas Department of State Health Services, 2011). Texas is divided into eleven public health regions and eight administrative regions. When a blood exposure incident occurs, the chief administrative officer of a covered facility is required to submit a "contaminated sharps injury report form" to the local health authority or the Department of State Health Services (DSHS) regional office if no local authority exists. After a review for completeness, the form is sent to the DSHS Infectious Disease Control Unit (IDCU) in Austin where it is compiled with other injury reports. Finally the reports are analyzed to better understand the factors surrounding sharps injuries and develop more effective prevention measures.

Culture Surrounding Sharps Injuries

Injury induced transmission of bloodborne pathogens in hospitals and clinics is a serious risk faced by healthcare professionals. Transmission of infections from patients to doctors, nurses, and technicians through accidental injuries is well documented (CDC, 2008). Reporting of the exposure circumstances not only provides valuable data to those concerned with improving healthcare safety through policy, but also is critical in settling insurance claims and workman's compensation. Reporting of exposures to potentially infectious materials is mandated both by OSHA's bloodborne pathogen standard and the analogous chapter of the Texas Administrative Code (25 TAC § 96, 2006; OSHA, 2011). Despite explicit regulations, the potential to contract serious diseases, and forfeiture of insurance and worker's compensations in the event of infection, many healthcare workers choose not to report contaminated sharps injuries and under reporting is well documented (Doebbeling, 2003; Elmiyeh, 2004). One survey of healthcare workers in a general hospital revealed that 49% of those that had experienced sharps injuries failed to report at least one incident (Elmiyeh, 2004). A statewide survey of Iowa's health care workers observed rates of non-reporting among physicians as high as 62% (Doebbeling, 2003). Another survey found that administrative data in two teaching hospitals only captured 36% of sharps injuries experienced by survey respondents (Boden, 2015). A perceived low

risk of transmission and being too busy to report were most often cited as the reason injuries were not formally reported (Elmiyeh, 2004). Physicians and those that experience frequent injuries were less likely to report than other healthcare personnel or those that experience injuries less frequently (Doebbeling, 2003).

Safety Engineered Devices

One approach to reducing the incidence of sharps injuries is the use of safety-engineered devices. Included among these are retractable hypodermic needles, single-use and pre-filled cartridge syringes, shielded needles, disposable scalpels, and blunt-tip suture needles. Implementation of these safer devices was encouraged by the enactment of the “Needlestick Safety and Prevention Act of 2000”, which mandated usage of safer sharps when appropriate and employee involvement in the selection of these devices (OSHA, n.d.). A study evaluating the incidence of needlestick injuries among healthcare workers found a significant reduction in injury rates after the implementation of passive safety engineered devices (Goris, 2014). Prior to the implementation of passive safety engineered devices, the incidence of needlestick injuries was 2.21 injuries per 100,000 employee productive hours; after implementation of these devices the incidence dropped to 0.42 injuries per 100,000 employee productive hours (Goris, 2014).

Exposure Control Plans

While Texas has opted out of formal OSHA participation and regulation, Texas’ model exposure control plan is explicitly designed to be analogous to that set forth by OSHA. All of OSHA’s precaution standards and key elements are present in Texas’ plan (25 TAC § 96, 2006; Texas Department of State Health Services, 2011). OSHA regulations dictate implementation of an exposure control plan in any facility in which there is potential for exposures (OSHA, 2011). There is some flexibility within individual plans, but they are all required to adhere to certain standards and include specific elements. These include:

- Identification of occupations and activities that present risks of exposure
- Establishing work environments and practices that limit risks to exposure (i.e. availability of hand washing stations, sharps disposal bins, and appropriate labeling of specimens and containers)

- Provision of appropriate personal protective equipment to those at risk, at no cost
- Maintaining a clean work environment
- Disposing of wastes appropriately
- Laundering or disposing of soiled garments
- Making hepatitis B vaccine available to those at risk at no charge
- Having a post exposure protocol when occupational exposures do occur (OSHA, 2001; OSHA, 2003).

The post exposure protocol must include source testing when possible, drawing of blood from the exposed to act as a base line, a physician consultation to evaluate risk, a physician opinion, and post exposure prophylactics when appropriate (OSHA, 2011).

Bloodborne Pathogens of Concern

Bloodborne pathogens have been associated with occupationally acquired infections in healthcare personnel; of significance are HBV, HCV, and HIV.

HBV

The CDC estimates that there are 700,000 to 1,400,000 persons currently living with a chronic hepatitis B infection in the US (CDC, 2013). HBV is transmitted through activities that involve percutaneous (i.e., puncture through the skin) or mucosal contact with infectious blood or body fluids (TDSHS, 2015). There are two stages to hepatitis B: acute and chronic (TDSHS, 2015). At the time of infection, people with hepatitis B are considered to have acute hepatitis B. In most cases their hepatitis B will resolve, but about 5% of adults become chronically infected (TDSHS, 2015). Symptoms of acute HBV infection include fever, anorexia, nausea, jaundice, dark urine, and pale feces (TDSHS, 2015). Persons with chronic HBV infection might be asymptomatic, have no evidence of liver disease, or have a spectrum of disease ranging from chronic hepatitis to cirrhosis or hepatocellular carcinoma (TDSHS, 2015). In the event of an HBV exposure, persons are administered hyperimmunoglobulin (high titer, hepatitis B virus surface antigen antibody) and the HBV vaccine in order to confer passive and active immunity respectively. Currently, extremely effective Hepatitis B vaccines are available and both OSHA and Texas' Administrative Code mandate

that they be made available to healthcare workers at no cost throughout employment (25 TAC § 96, 2006; OSHA, 2011).

HCV

The CDC estimates that 3.2 million persons in the US live with chronic hepatitis C infections (CDC, 2013). People become infected with the Hepatitis C virus (HCV) by coming in contact with the blood or bodily fluids of an infected person. HCV infections are most commonly associated with sharing of needles, syringes, or other equipment to inject drugs, needlestick injuries in healthcare settings, and being born to a mother who has hepatitis C (TDSHS, 2015). Unlike HBV infection, HCV infection is much more likely to result in chronic hepatitis; HCV infection becomes chronic in approximately 75%–85% of cases (CDC, 2013). As with hepatitis B infections, if a person has been infected with hepatitis C for many years, his or her liver may be damaged. Symptoms of acute HCV infection are jaundice, fever, nausea, fatigue, and vomiting, though approximately 70%–80% of people with acute Hepatitis C do not have any symptoms (TDSHS, 2015). For those exposed to the virus, alpha interferon reduces the chances of developing chronic hepatitis. The initial two direct acting oral antiviral agents were approved in 2011 and since then a number of additional medications have been approved for treatment of chronic hepatitis C infection. There is however no effective HCV vaccine available.

HIV

In the US it is estimated that 1.2 million people are currently infected with HIV; 490,000 of those infected with HIV have been diagnosed with AIDS (CDC, 2011). The main routes of transmission for the virus are through sexual contact, injection drug use, and perinatally from mother to child (TDSHS, 2016). Acute HIV infection presents with a fever, lethargy, rash of the arms, legs, and trunk, and swollen lymph nodes (CDC, n.d.). Progression of HIV infection to AIDS results in compromised host immunity and frequent and severe secondary opportunistic infections. In occupational healthcare exposures, the rates of transmission in mucocutaneous, non-intact skin, and percutaneous exposures are 0.1%, <0.1%, and 0.3%, respectively (CDC, 2008). Combinations of antiretroviral drugs designed to inhibit viral replication are effective at reducing viral loads in the body, however there is no cure for AIDS. There is currently no vaccine for HIV.

Methods

Case Definition

An incident is considered reportable if a percutaneous injury occurred from a sharp that was contaminated or possibly contaminated with blood or other potentially infectious materials.

Study Population

The study population consisted of employees from governmental entities in Texas who reported the 1263 occupational sharps injuries that occurred in 2012. Uncontaminated sharps injuries that occurred before the sharp was used for its intended purpose were not included. Such an incident did not pose a bloodborne pathogen transmission risk. Texas law did not require reporting from private healthcare facilities and any sharps reported to the DSHS from private facilities were removed from the data (25 TAC § 96, 2006).

Diverse sharps were represented in this study including disposable syringes, suture needles, surgical scalpels, surgical drills, and glassware items such as capillary tubes, flasks, and laboratory slides. Individual occupations of the injured HCW included, but were not limited to registered nurses, attending physicians, housekeeping staff, school nurses, medical students, and various types of medical technicians.

Data Analysis

Descriptive statistics, counts and percentages, were used to characterize the responses to each question. Comprehensive denominator data were not available; therefore no rates could be calculated. Cross tabulations were used to examine relationships between responses to different questions. Variables examined included geographic, temporal, gender and age distributions in addition to the type of sharps Involved.

Data Highlights

Public Health Region and County where Injury Occurred. As seen in Figure 1, the number of reported contaminated sharps injuries in each Health Service Region is listed below the HSR number. Health Service Regions 6/5S and 2/3 had the most sharps injuries, each with more than 200 cases of sharps injuries.

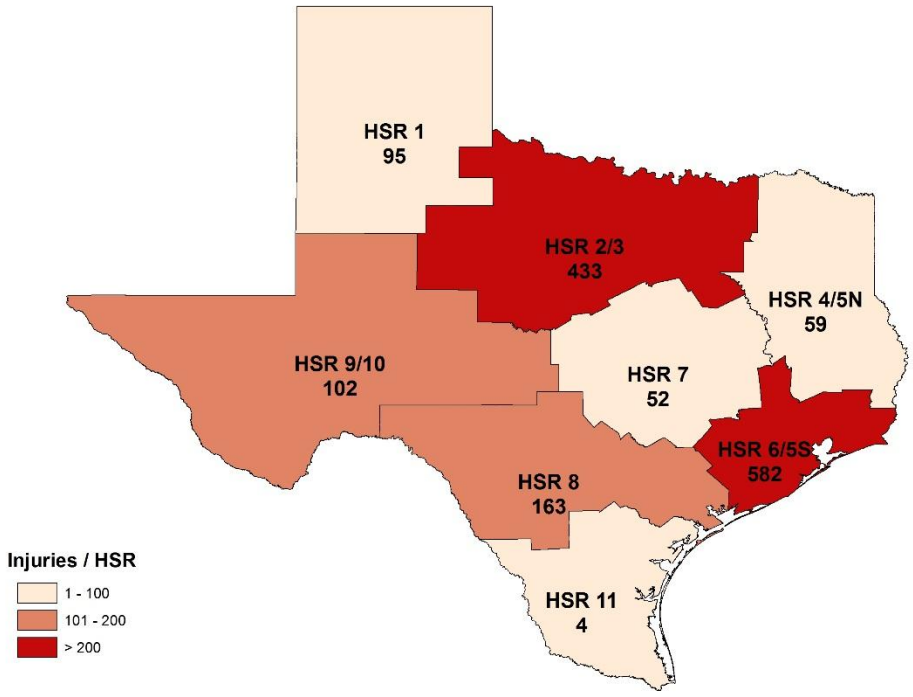

Figure 1, Reported injuries by Health Service Region

Facility where injury occurred. Out of 1263 reported injuries, 81.7% (1032) occurred in hospitals. Clinics reported the second highest number of injuries 7.6% (96) with school/college, emergency services, and correctional facilities accounting for a combined total of 3.9% (50) (Table 1).

Facility	Number	Percent
Hospital	1032	81.7%
Clinic	96	7.6%
Correctional Facility	19	1.5%
School/College	17	1.3%
EMS/Fire/Police	14	1.1%
All Others	71	5.6%
Unknown	14	1.1%
Total	1263	100.0%

Table 1, Injuries by facility type

Occupation of the Injured Healthcare Worker. Table 2 shows the five occupations that sustained the most injuries in 2012. Interns/Residents sustained more injuries than any other single occupation, accounting for 23.1% of all reported incidents. Registered Nurses and attending physicians received 21.5% and 13.6% of reported injuries, respectively.

Job Type	Number	Percent
Intern/Resident	292	23.1%
Registered Nurse	271	21.5%
Attending Physician	172	13.6%
Student	72	5.7%
OR/Surgical Technician	64	5.1%
All Others	379	30.0%
Unknown	13	1.0%
Total	1263	100.0%

Table 2, Top five occupations injured

Injury by Work Shift. Figure 2 shows the time of day, by shift, when the injuries occurred. The majority of injuries, 55.4%, occurred after 7am and before 3pm.

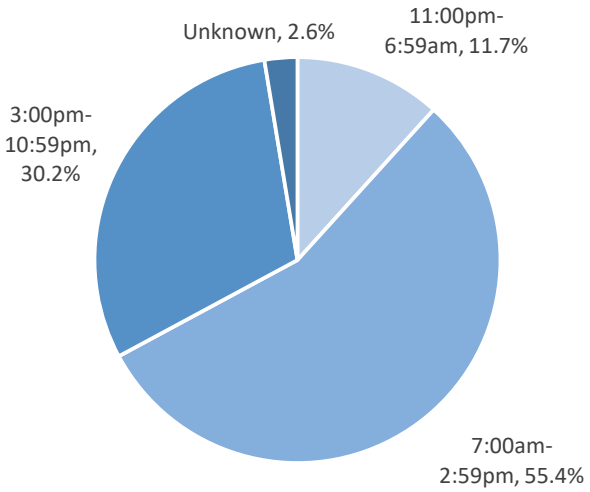

Figure 2, Time of day when reported injuries occurred

Gender and Injury. Almost two-thirds of the injuries occurred in females – 59.5% (Figure 3). The gender of the person who sustained the sharps injury is unknown in 2.6% of reported sharps injuries.

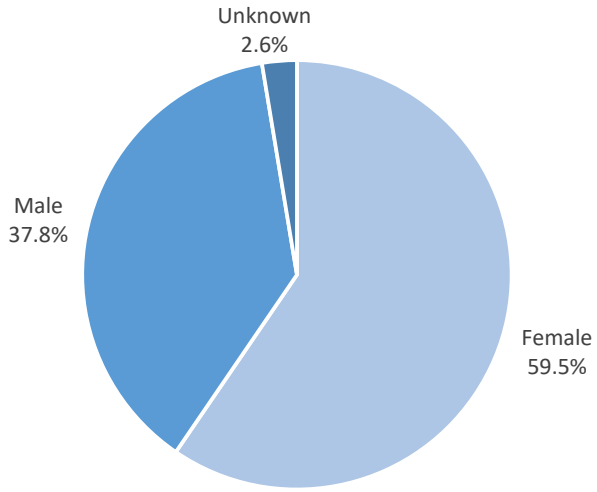

Figure 3, Sharp injuries by gender

Age Distribution. The distribution of injury reports by age is presented in Figure 4. Twenty six to thirty five year olds reported more injuries than any other age group, with 46.2% of injuries.

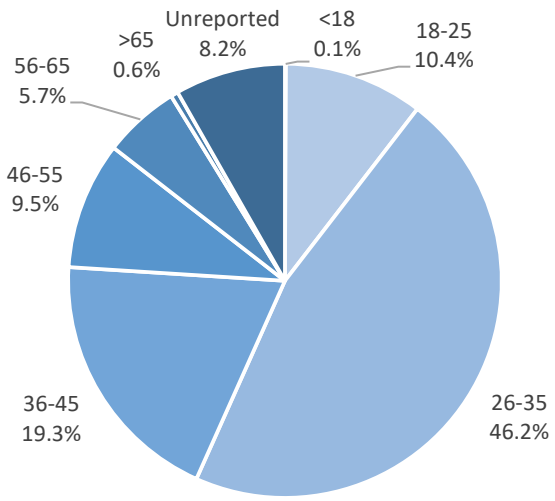

Figure 4, Age distribution of sharps injuries

Injury by Device Type. The data were categorized into the top five instrument types that caused injuries. Needles involving syringes accounted for 40.7% of all injuries (Table 3). Other types of sharps that were not included in the top five accounted for a combined total of 11.3% of injuries. These included surgical drills, nails, teeth, forceps and other devices. A more detailed list of devices that caused injury can be found in the appendix.

Type of Sharp	Number	Percent
Needle/Syringe	514	40.7%
Suture Needle	338	26.8%
IV Catheter/Needle	100	7.9%
Scalpel	72	5.7%
Winged Steel Needle	62	4.9%
All Others	143	11.3%
Unknown	34	2.7%
Total	1263	100.0%

Table 3, Injuries by type of sharp device

Intended Sharps Use. The intended use of the device provides another perspective on the injuries and their prevention. Suturing and injections accounted for the largest proportions of injuries, 24.4% and 21.3% respectively (Table 4). Drawing blood or taking tissue samples accounted for an additional 12.4% of the injuries. For 21.2% of devices, the intended use of device was unreported or unknown.

Original Intended Use	Number	Percent
Suturing	308	24.4%
Injection, SC/ID/IM	269	21.3%
Draw Blood/Body Fluid/Tissue Sample	157	12.4%
IV/Central Line Use	94	7.4%
All Others	167	13.2%
Unknown	268	21.2%
Total	1263	100.0%

Table 4, Injuries by intended use of device

Safety Engineering Status. Table 5 breaks down injuries by whether or not the device had safety engineering protection. Nearly half (48.3%) of all devices involved in injuries did not have safety engineered protection. 19.1% of reporters indicated they did not know if the device that caused the injury was safety engineered.

Was Device Safety-Engineered?	Number	Percent
Yes	366	29.0%
No	610	48.3%
Don't know	241	19.1%
Unreported	46	3.6%
Total	1263	100.0%

Table 5, Safety engineered status of device causing injury

Table 6 shows the activation status of sharps' safety mechanism at the time of injury. 28.4% reported that the mechanism was fully activated at the time of injury; and 60.7% reported that the safety mechanisms on their devices were not activated.

Was the Safety Mechanism Activated?	Number	Percent
Yes	104	28.4%
No	222	60.7%
Don't know	26	7.1%
Unreported	14	3.8%
Total	366	100.0%

Table 6, Status of safety mechanism at time of injury

Adherence to bloodborne pathogen precautions. Table 7 breaks down the occurrence of sharps injuries by the adherence to bloodborne pathogen precautions at the time of injury. These precautions have been adopted as the minimum standard by Texas law and listed in the exposure control plan developed by the DSHS (25 TAC § 96, 2006). Utilization of bloodborne pathogen precautions was high meaning that they were wearing gloves (92.3%), vaccinated for HBV (91.6%), trained in BBP in the past 12 months (81.9%) and there was a sharps container available (93.9%).

	Wearing Gloves at Time of Injury?		HBV Vaccinated?		BBP Training in Past 12 mo.?		Sharps Container Available?	
	Count	%	Count	%	Count	%	Count	%
Yes	1166	92.3%	1157	91.6%	1034	81.9%	1186	93.9%
No	59	4.7%	29	2.3%	104	8.2%	27	2.1%
Don't Know	9	0.7%	58	4.6%	0	0	0	0
Unreported	29	2.3%	19	1.5%	125	9.9%	50	4.0%
Total	1263	100.0%	1263	100.0%	1263	100.0%	1263	100.0%

Table 7, Adherence to bloodborne pathogen precautions.

Sharps injury reports over the years. From 2005 to 2012 the number of contaminated sharps reports received by DSHS has fluctuated, but showed an overall downward trend. Reported sharps injury data from 2011 were unavailable and are not included in the following line graphs (Figure 5).

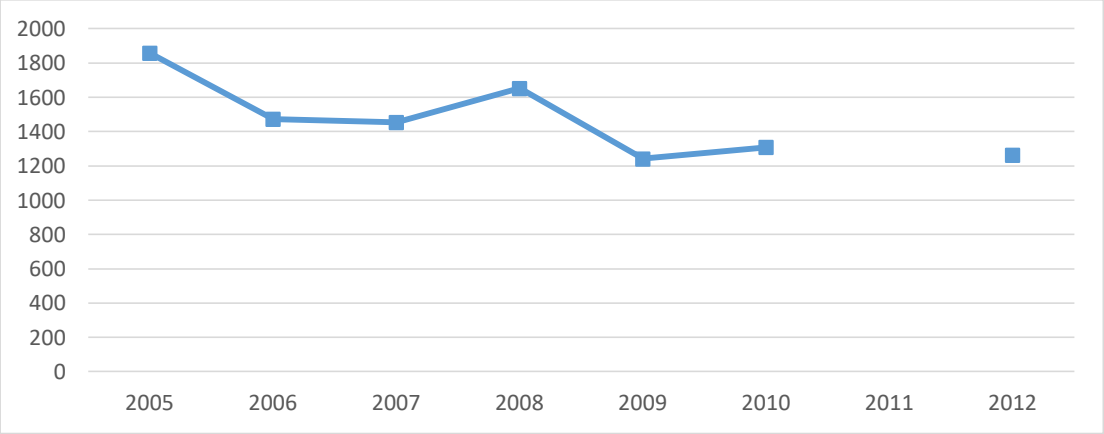

Figure 5, Number of sharps injuries reported: 2005-2012

Figure 6 shows the top five facility types in which sharps injuries were reported to have occurred over the same 7-year period. Hospitals reported approximately 80% of injuries every year. No other facility type accounted for more than 10% of injuries over this time period.

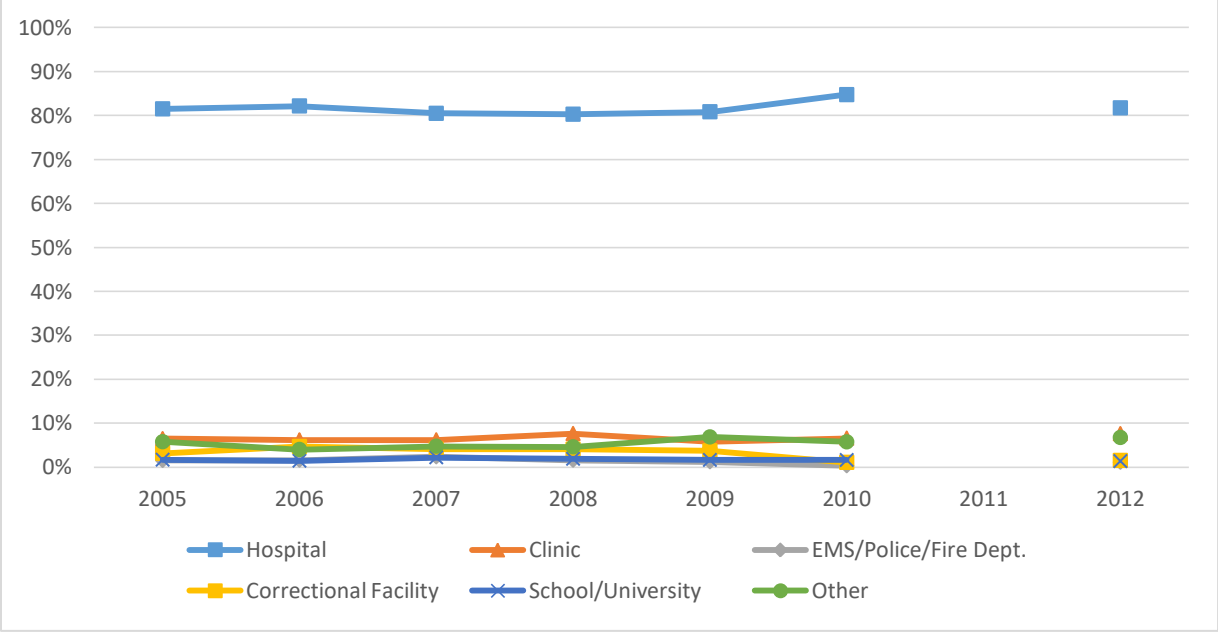

Figure 6, Distribution of sharps injuries by facility type: 2005-2012

Figure 7 presents the distribution of reported sharps injuries among the top reporting occupations. Registered nurses accounted for less than 25% of injuries reported from 2005 to 2008, but surpassed the 25% mark in 2009. In 2012, interns and residents accounted for the majority of sharps injuries for the first time since reporting started in 2005.

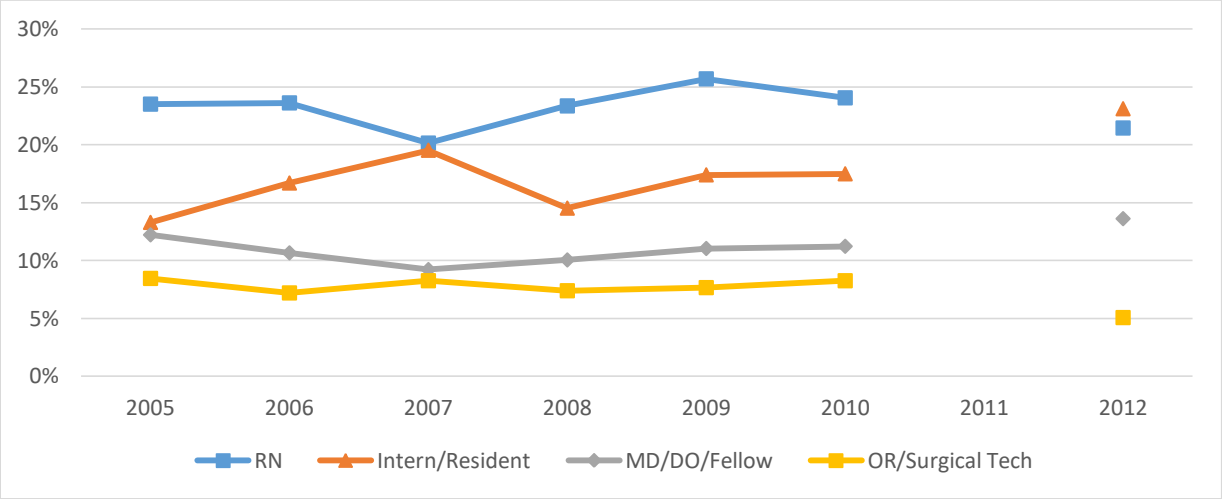

Figure 7, Occupations reporting the greatest proportion of sharps injuries: 2005-2012

As with the distribution of injuries across facility types, the breakdown of injuries by the type of device remained fairly stable over the years (Figure 8). Syringes and suture needles were the devices that healthcare workers injured themselves with most often and were involved in about half of all injuries every year.

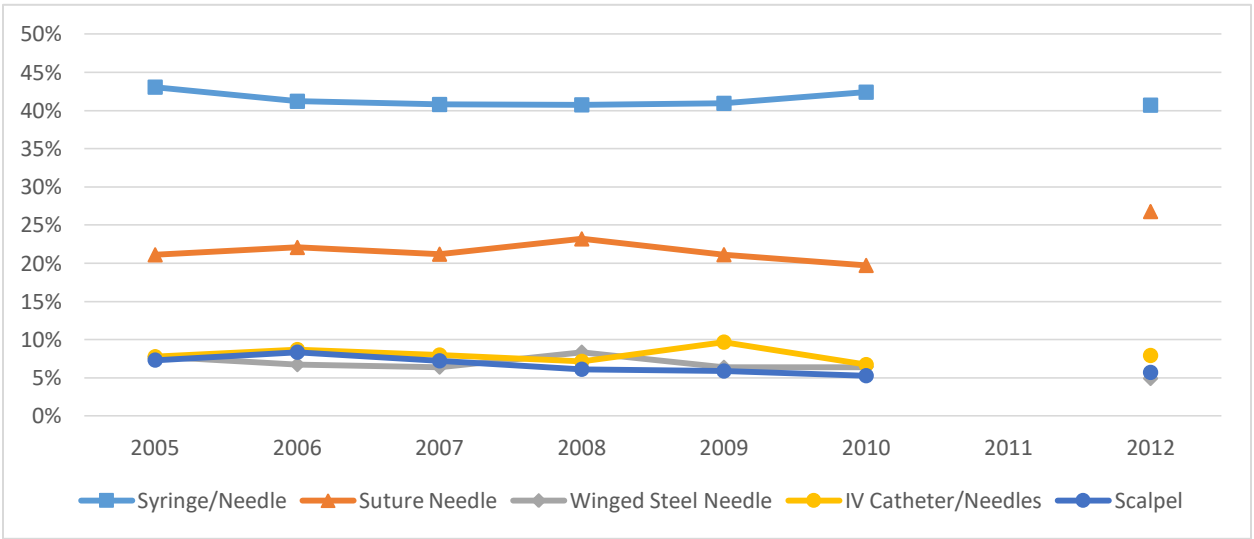

Figure 8, Injury by sharp type: 2005-2012

Figure 9 depicts injury trends by safety-engineered status. A linear decrease in the proportion of injuries from non-safety engineered devices was found with a corresponding increase in the proportion of injuries from safety engineered and unknown devices until 2010, but data from 2012 shows the opposite.

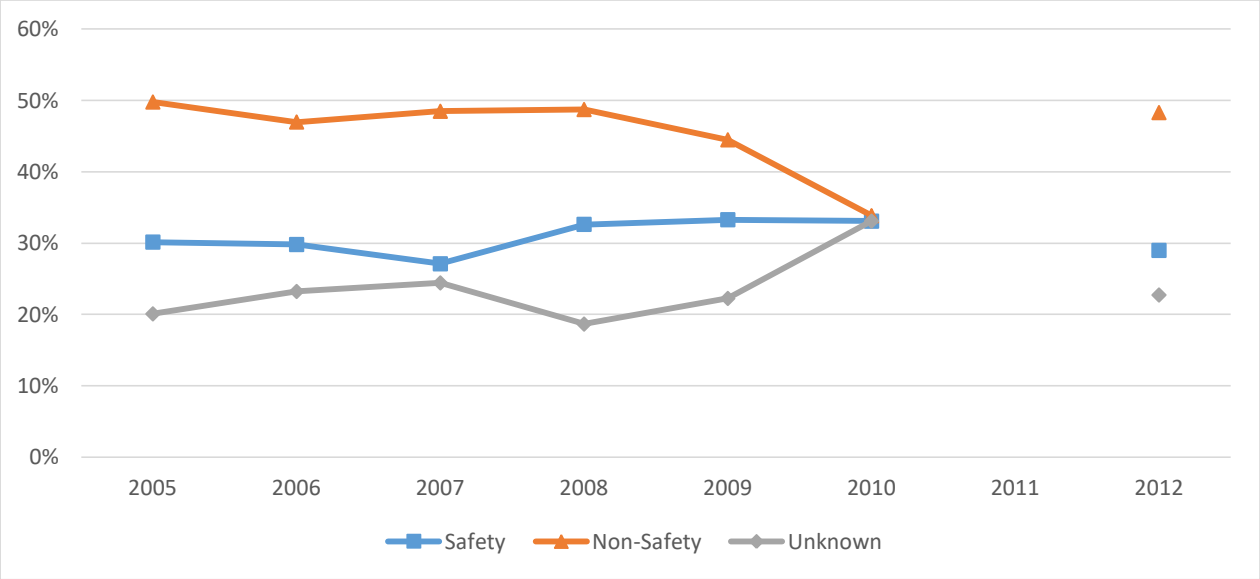

Figure 9, Injury by safety engineered status: 2005-2012

Limitations

This report has five important limitations:

1. There were few denominator data to compute injury rates and therefore denominator data were not included. Good examples of denominator data would be:
    a. The number of total sharps related procedures, broken out by type of sharps used, carried out by facilities in Texas each year within in each region
    b. The number, occupation and gender of healthcare workers at risk for sharps injuries each year.
2. Sharps injuries are known to be under-reported. Therefore, this report likely underestimates the total number of sharps injuries that occurred in government entities during 2012.
3. Many of the reporting forms were incomplete. Therefore, the report does not fully characterize the reported injuries.

4. This report also does not include data reported by private entities to the DSHS which are not required by statute to report. Therefore, this report is only representative for injuries occuring in governmental entities and not all entities.
5. Data from 2011 were unavailable and therefore analysis of trends were incomplete.

Additionally, illogical responses to questions resulted in records being removed from the analysis. For example, a report indicating that the device in use did not have safety engineering protection and in a subsequent response indicating that the safety feature was fully activated.

Discussion

The two occupations that incurred the most sharps injuries are interns/residents and registered nurses. This is consistent with national data (Jagger, 2008; Sharma, 2009). The gender disparity within the nursing profession may explain why about 2 females were injured for every 1 male. The high percentage (56.6%) of younger healthcare workers (between the ages of 18-35) who reported a contaminated sharps injury may be explained by the high number of interns and residents who experienced a sharps injury. In addition, a survey conducted among medical school graduates indicated that underdeveloped manual skills and a stressful work environment contribute to injuries (Sharma, 2009). Providing additional training and practice to these two risk groups may be an effective way to reduce injuries.

Injection and suturing were most often cited as the intended uses of the sharps that caused injury. Combined these procedures were involved in about 45.8% of all injuries. The two devices most commonly involved in the reported sharps injuries also happened to be syringes (40.7%) and suture needles (26.8%). While progress has been made in the engineering of safer syringes, such as syringes with auto-retracting needles, they remain as the top cause of injuries. Suture needles' design simplicity, essentially a curved hook with a loop for suture, limits its potential for safety- engineering. One approach is to blunt suture needlepoints and other safety-engineered sharps which have been proven by multiple studies to be effective at reducing injury rates (CDC, 2008; Goris, 2014; Jagger, 2008).

Despite the emphasis on engineered safety solutions, 67.4% of injury reports indicated safety-engineering status was either absent or unknown. When devices did possess safety features, 28.4%

of the injured healthcare workers were likely injured while attempting to activate safety mechanisms or after activation. This may be due to the healthcare workers' stressful work environment, lack of proper training on devices or defective design. Ongoing diligence in evaluation of devices and staff training in use by healthcare facilities would be an important step.

A more positive finding was that, despite being injured, healthcare professionals by and large adhered to the bloodborne pathogen precautions such as hepatitis B vaccination, recent exposure risk training and the use of gloves with about 90% compliance reported. Another positive finding is that trends over the years (excluding 2011) show that fewer sharps injuries are being reported. Ultimately, it's a facility's embrace of the culture of safety that will lead to the lowest rates of sharps injuries. To facilitate that, the culture of safety must be part of the education of all future healthcare practitioners. Such a program would de-stigmatize accidental occupational injury and promote reporting and the correct use of safety devices.

Appendix

Table 1. Injuries by Facility Type	Number	Percent
Hospital	1032	81.7%
Clinic	96	7.6%
Correctional Facility	19	1.5%
School/College	17	1.3%
EMS/Fire/Police	14	1.1%
All Others		
Reported as Other	34	2.7%
Dental Facility	19	1.5%
Laboratory (freestanding)	7	0.6%
Outpatient treatment (dialysis, infusion)	4	0.3%
Medical examiner office/morgue	3	0.2%
Residential Facility (eg MHMR, shelter)	2	0.2%
Home Health	2	0.2%
Unreported	14	1.1%
Total	1263	100.0%

Table 2. Injuries by Work Area	Number	Percent
Surgery/Operating Room	396	31.4%
Patient/Resident Room	181	14.3%
Other	118	9.3%
Emergency department	99	7.8%
Critical Care Unit	70	5.5%
Medical/Outpatient Clinic	56	4.4%
Procedure Room	53	4.2%
Laboratory	47	3.7%
Dental Clinic	37	2.9%
Medical/Surgical Unit	37	2.9%

L & D/Gynecology Unit	36	2.9%
Radiology Department	28	2.2%
Pre-op or PACU	14	1.1%
Jail Unit	13	1.0%
(blank)	13	1.0%
Infirmary	11	0.9%
Autopsy/Pathology	10	0.8%
Ambulance	9	0.7%
Pediatrics	9	0.7%
Floor (not patient room)	7	0.6%
Home	6	0.5%
Nursery	3	0.2%
Seclusion Room/Psychiatric Unit	2	0.2%
Service/Utility Area	2	0.2%
central supply	1	0.1%
Dialysis Room/Center	1	0.1%
L & D Gynecology unit	1	0.1%
Procedure Room	1	0.1%
Endoscopy/Bronchoscopy/Cystoscopy	1	0.1%
Field (non EMS)	1	0.1%
Total	1263	100.0%

Table 3. Injuries by Occupation	Number	Percent
Intern/resident	292	23.1%
Registered Nurse	271	21.5%
Attending Physician (MD/DO)	125	9.9%
Other	90	7.1%
OR/Surgical Technician	64	5.1%
Fellow	47	3.7%
Licensed Vocational Nurse	46	3.6%
Medical Student	46	3.6%

Phlebotomist/Venipuncture/IV Team	34	2.7%
Physician Assistant	33	2.6%
Housekeeper/Laundry	30	2.4%
Aide (eg CAN, HHA, orderly)	26	2.1%
Clinical lab technician	20	1.6%
Dental Student	18	1.4%
EMT/Paramedic	16	1.3%
(blank)	14	1.1%
CRNA/NP	12	1.0%
Radiologic Technician	11	0.9%
Dental assistant/technician	9	0.7%
Respiratory Therapist/Technician	8	0.6%
Researcher	7	0.6%
Nursing Student	7	0.6%
Dentist	6	0.5%
School Personnel (not a nurse)	6	0.5%
Law Enforcement Officer	4	0.3%
Firefighter	4	0.3%
Physical Therapist	4	0.3%
Morgue tech/autopsy tech	3	0.2%
Food Service	2	0.2%
Student	1	0.1%
Central supply	1	0.1%
Safety/Security	1	0.1%
Public Health Worker	1	0.1%
Psychiatric Technician	1	0.1%
Nurse Midwife	1	0.1%
medical Assistant	1	0.1%
Clerical/Administrative	1	0.1%
Total	1263	100.0%

Table 5. Area of the Body Injured	Number	Percent
Hand	1174	93.0%
Arm	62	4.9%
Leg/Foot	10	0.8%
Face/head/neck	4	0.3%
Torso (front or back)	2	0.2%
(blank)	11	0.9%
Total	1263	100.0%

Table 6. Injuries by Sharp Type	Number	Percent
Needle/Syringe	514	40.7%
Suture Needle	338	26.8%
IV Catheter/Needle	100	7.9%
Other	75	5.9%
Scalpel	72	5.7%
Winged Steel Needle	62	4.9%
Unknown	34	2.7%
Glass	20	1.6%
Lancet (Finger/Heel Stick)	14	1.1%
Nail/Tooth	11	0.9%
Scissors	9	0.7%
Trocar	7	0.6%
Other Blade	7	0.6%
(blank)		0.0%
Total	1263	100.0%

Table 7. Injuries by Original Intended Use of Sharp	Number	Percent
Injection, Intra-Muscular/Subcutaneous/Intra-dermal (syringe)	269	21.3%
Other	217	17.2%
Suturing, Skin	172	13.6%

Draw Venous Blood Sample	94	7.4%
Suturing, Deep	76	6.0%
Unknown/Not Applicable	65	5.1%
Start IV or set up Heparin lock (IV catheter or winged set-type needle)	64	5.1%
Cutting	61	4.8%
Suturing	60	4.8%
Obtain body Fluid/tissue sample	45	3.6%
Dental	26	2.1%
Draw arterial sample	18	1.4%
Finger stick/heel stick	18	1.4%
Wiring	13	1.0%
Remove Central Line/Porta Catheter	12	1.0%
(blank)	12	1.0%
Drilling	9	0.7%
Other Injection into (or aspiration from) IV Injection Site or IV Port (syringe)	8	0.6%
Electrocautery	6	0.5%
Contain a Specimen or Pharmaceutical (glass Item)	6	0.5%
Connect IV line (intermittent IV/ piggyback/IV infusion/other IV line connection)	5	0.4%
Heparin or Saline Flush	4	0.3%
Dialysis	1	0.1%
Debridement	1	0.1%
Surgery	1	0.1%
Total	1263	100.0%

Table 8. When and How the Injury Occurred	Number	Percent
Other	294	23.3%
Between steps of a multistep procedure	283	22.4%
Suturing	126	10.0%
Patient moved during procedure	76	6.0%

Activating safety device	73	5.8%
(blank)	68	5.4%
Unsafe Practice	66	5.2%
Found in an inappropriate place (eg. Table, bed, floor, trash)	49	3.9%
Interaction with another person	48	3.8%
Use of Sharps Container	40	3.2%
Recapping	36	2.9%
Disassembling device or equipment	29	2.3%
Device Malfunction	26	2.1%
Laboratory Procedure/Process	24	1.9%
Use of IV/Central Line	15	1.2%
Preparation for reuse of instrument (cleaning, sorting, disinfecting, sterlizing, etc.)	6	0.5%
Unknown	3	0.2%
While disassembling	1	0.1%
Total	1263	100.0%

Table 9. Safety Engineered Protection	Number	Percent
Yes	366	29.0%
No	610	48.3%
Don't know	241	19.1%
Unreported	46	3.6%
Total	1263	100.0%

Table 10. Protective Mechanism Activation	Number	Percent
Yes	104	28.4%
No	222	60.7%
Don't know	26	7.1%
Unreported	14	3.8%
Total	366	100.0%

Table 11. When During Device Activation Did Injury Occur	Number	Percent
After	66	18.0%
Before	168	45.9%
During	98	26.8%
(blank)	34	9.3%
Total	366	100.0%

Table 12. Was the injured person wearing gloves	Number	Percentage
Yes	1166	92.32%
No	59	4.67%
Don't Know	9	0.71%
(blank)	29	2.30%
Total	1263	100.00%

Table 13. Was the injured person vaccinated against Hepatitis B	Number	Percentage
Yes	1157	91.61%
No	29	2.30%
Don't Know	58	4.59%
(blank)	19	1.5%
Total	1263	100.00%

Table 14. Was a sharps container available for disposal	Number	Percentage
Yes	1186	93.9%
No	27	2.1%
(blank)	50	4.0%
Total	1263	100.00%

Table 15. Injured person receive exposure control training within last 12 months	Number	Percentage
Yes	1034	81.87%
No	104	8.23%
(blank)	125	9.90%
Total	1263	100.00%

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