

EXPO-S.T.O.P. 2016 and 2017 Report

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Background. Since 2011 the annual Exposure Survey of Trends in Occupational Practice (EXPO-S.T.O.P.),¹⁻⁴ conducted on behalf of the Association of Occupational Health professionals in Healthcare (AOHP), has served as a national overview of exposure incidence and supplements the detailed surveys of the International Safety Center (EPINet)⁵ and Massachusetts Sharps Injury Surveillance System (MSISS).⁶

This report, for AOHP members and EXPO-S.T.O.P. participants, presents the results of the EXPO-S.T.O.P. 2016 and 2017 surveys (6th and 7th). A formal publication will appear in 2019.

Overview of Surveys. EXPO-S.T.O.P. 2016, with 37 states participating (Fig 1), is geographically our most extensive, and EXPO-S.T.O.P. 2017, with 224 hospitals participating, is our largest to date (Table 1), and we heartedly thank all the participants. Non-hospital facilities are excluded from this report and will be the subject of a separate paper. Table 1 shows that hospital sizes, measured by Average Daily Inpatient Census (ADC), ranged from very small to very large. Teaching status is associated with higher exposure incidence and Table 1 shows almost 50% of EXPO-S.T.O.P.'s hospitals were teaching facilities however, of the nation's 6200 hospitals,⁷ 1,100 (18%) are teaching,⁸ thus, with a high bias towards teaching facilities, the surveys' exposure rates are likely to be higher than the true national incidence (NB. Readers may find Fig 2 helpful in benchmarking by size).

Table 1. Overview of Survey

Year	Total Responses	Non-hospitals	Hospitals	Hospital size-range (ADC)	Number US states	% Teaching hospitals
2011	116	0	125	6 - 975	29	38.3%
2012	125	14	157	5 - 985	32	39.8%
2013	100	12	94	1 - 984	28	53.3%
2014	100	12	94	1 - 984	28	53.4%
2015	182	41	182	1 - 924	38	39.8%
2016	159	11	170	1 - 898	37	46.5%
2017	174*	37	224*	2 - 950	33	49.6%

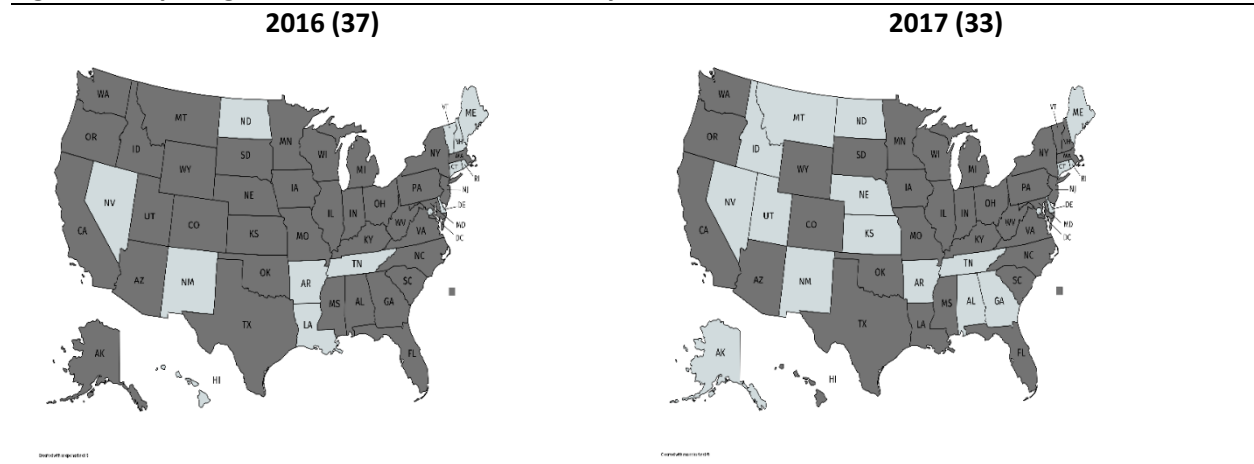
ADC average daily census (overnight occupied beds).

* Data on multiple hospitals submitted by several responders.

Exposure incidence. The 2016 and 2017 overall results for all hospitals (Table 2), like the 2015 results, show a significant increase in incidence over the 2011 results, irrespective of the denominator used. We believe FTE to be a more accurate indicator of workloads than ADC⁴ and as such, a superior denominator, and it is alarming that the last three surveys have shown a

year on year significant increase in SI incidence per 100 FTE (Table 2). Also disturbing is that, in each incidence parameter, the median (mid value) is lower than the average, indicating that high incidences are occurring in more than 50% of hospitals surveyed. The wide range of results in each parameter reflects this – with 17/202 (8.4%) of hospitals in 2017 having an incidence more than double the median SI/100 FTE value.

Fig 1. Participating states in 2016 and 2017 Surveys



Nurse SI/100 FTE (Table 2) is an excellent index of SI reduction-strategy effectiveness as: it examines SI incidence in a specific sharps-user cohort; and, given that the majority of OR SI to staff are sustained by doctors,⁹ can reflect SI incidence, and use of safety engineered devices (SED), in non-OR clinical units. It is pleasing to note the reduction in SI to nurses in the last 3 surveys, particularly in teaching facilities, and this may indicate more frequent and/or more correct use of SED.¹⁰

Table 2. Sharps Injury incidence by year

	2011	2015	2016	2017	2017 Median; Range
SI/100 ADC (All hospitals)	24.0	25.2*	27.0*	27.7	21.3; 0 – 160.3
• Non-teaching hospitals	17.8	17.5	17.5	16.5	17.1; 1.1 – 160.4
• Teaching hospitals	27.4	30.4*	33.3*	32.4	25.5; 0 – 125.0
SI/100 FTE (All hospitals)	1.9	2.1*	2.3*	2.5*	2.0; 0 – 7.7
• Non-teaching hospitals	1.3	1.7*	2.0*	2.0	1.9; 0.2 – 5.2
• Teaching hospitals	2.0	2.4*	2.5	2.7*	2.3; 0 – 7.7
Nurse SI/100 Nurse FTE (All hospitals)	N/Av	3.2	2.8*	2.7	2.6; 0 – 13.3
• Non-teaching hospitals	N/Av	2.7	3.1*	2.7*	2.5; 0 – 8.9
• Teaching hospitals	N/Av	3.4	2.7*	2.7	3.0; 0 – 13.3

SI sharps injury; ADC average daily census (overnight occupied beds); FTE full time equivalent staff.

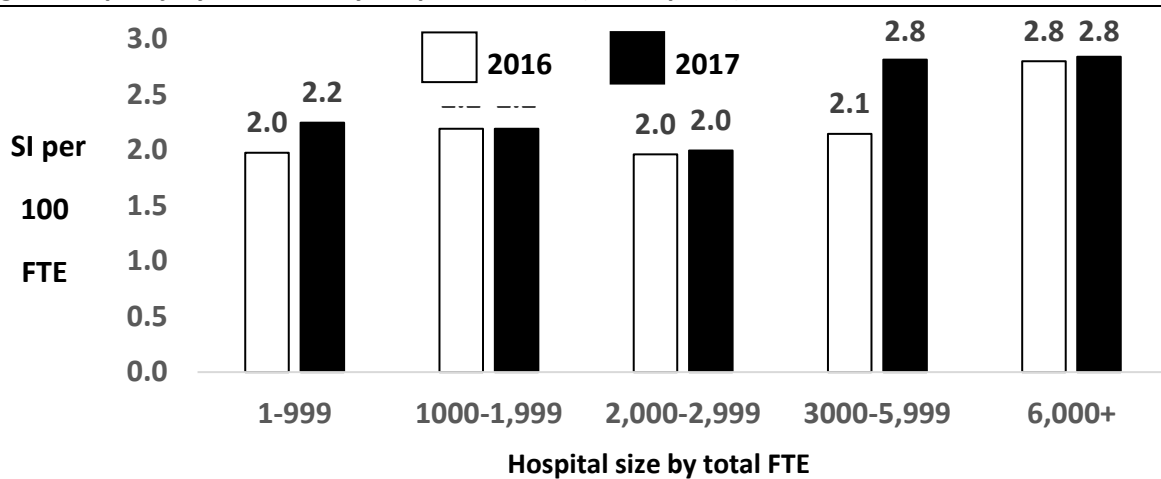
* Significant difference from value in immediate column to left

SI Incidence by hospital size. Many EXPO-S.T.O.P. participants express a desire to benchmark their rates against rates of hospitals of similar size to theirs. Rates by five hospital sizes are

shown in Fig 2. As in previous surveys,⁴ the effect of size is not linear – in 2017 the rates in mid-size hospitals (2,000-2,999 FTE) were significantly different from smaller and larger hospitals (in 2016 a significant difference was found only between mid-size and larger hospitals). We suggest the “high-low-higher” trend is likely due to the greater intensity of sharps use in larger hospitals and a “no blame”, higher reporting in smaller hospitals.⁴

Incidence of mucocutaneous exposures. Table 3 depicts the incidence of mucocutaneous exposures (MCE) for 2016 and 2017 and two previous surveys. As a proportion of total potential blood and body fluid exposures (BBFE), MCE in 2016 and 2017 accounted for 26% of potential BBFE, with little change in 7 surveys.¹⁻⁴ The median MCE proportion of 22.2% for 2017 was due to 30 hospitals (mostly small) reporting zero MCE exposures. Using ADC as the denominator, MCE incidence shows no linear trend from 2011 to 2017, however the All-hospital and Teaching-hospital MCE rates in 2017 were significantly higher than in 2011. In 2017, using FTE as denominator, the three MCE indices were significantly higher than those in 2011. This increase in MCE exposures may indicate staff are conducting more MCE-prone exposures, and/or are using PPE less frequently or less effectively.

Fig 2. Sharps injury incidence by hospital FTE size (all hospitals)



SI sharps injury; FTE full time equivalent staff

Table 3. Mucocutaneous exposure incidence by year

	2011	2015	2016	2017	2017 Median; Range
MCE/100 ADC (All hospitals)	9.0	10.5	11.2	9.6**	7.3; 0 – 33.1
• Non-teaching hospitals	7.1	8.6	6.5	6.0**	4.2; 0 – 27.7
• Teaching hospitals	10.1	11.7	13.9	10.9**	9.1; 0 – 33.1
MCE/100 FTE (All hospitals)	0.69	0.86*	0.82	0.87***	0.68; 0 – 3.0
• Non-teaching hospitals	0.59	0.85*	0.58*	0.72***	0.58; 0 – 3.0
• Teaching hospitals	0.71	0.86*	0.92	0.93**	0.83; 0 – 3.0
MCE as % of total BBFE	26.8%	28.6%	27.1%	25.6%	22.2%; 0 – 66.7%

MCE Mucocutaneous exposure; ADC average daily census (overnight occupied beds); FTE full time equivalent staff.

* Significant difference from value in immediate column to left; ** significantly different from 2011

Proportions of staff work-groups reporting SI. In previous EXPO-S.T.O.P. hospitals,¹⁻⁴ nurses reported a higher proportion of total reported SI than doctors, however in 2016 and 2017, nurse-reported SI, for the first time, fell below 40% of total SI. (Table 4). SI reported by doctors have steadily increased since 2011 but have been consistently less than that reported by nurses (including the 2016 and 2017 surveys). However, EPINet 2016 and 2017 surveys show doctors now exceed nurses in number of reported SI.⁵ This may indicate doctors are reporting more SI or that nurses are experiencing less SI (with greater SED use in clinical areas over that in surgical procedures). This finding is supported by the rising proportion of SI reported during surgical procedures in EXPO-S.T.O.P. hospitals (Table 4).

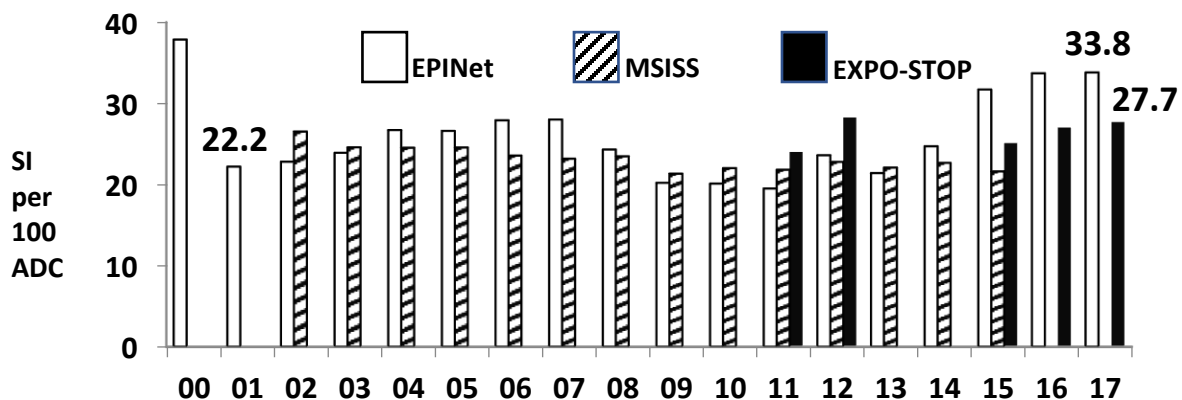
Table 4. Sharps Injuries: proportions among Nurses, Doctors and Surgery staff

	2012	2015	2016	2017
Nurse SI as % of Total SI	41.8%	45.6%	36.4%	37.6%
Doctor SI as % of Total SI	28.0%	32.3%	35.6%	32.7%
Surgery SI as % of Total SI	38.6%	38.3%	39.0%	39.9%

SI sharps injury

Trends in SI since OSHA Needlestick Safety and Prevention Act. Fig 3 shows the incidence per 100 ADC of EXPO-S.T.O.P., EPINet and MSISS databases (MSISS data converted to SI per 100 ADC). MSISS surveys show a slight fall then, from 2009 to 2015, a plateau (2016 and 2017 data yet to be released). EPINet and EXPO-S.T.O.P. surveys mirror each other and, alarmingly show a significant rise since the low rates of 2009-11. As stated earlier, we believe FTE to be a more accurate workload indicator, and, although SI/ 100 FTE rate are not available for all years, Fig 4 depicts the early EPINet FTE rates and the recent, rising EXPO-S.T.O.P. FTE rates. No matter which of EPINet, MSISS or EXPO-S.T.O.P. databases is used, all show that the significant decrease in SI in the immediate years following OSHA’s Needlestick Safety and Prevention Act (NSPA) in 2001,¹¹ has not been sustained.

Fig 3. SI incidence trends 2000 – 2017 (ADC as denominator)

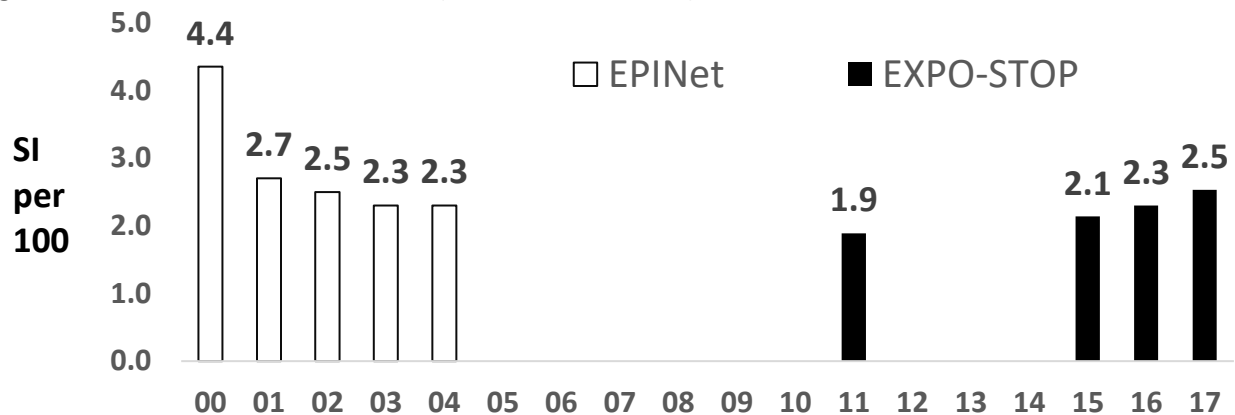


ADC average daily census (overnight occupied beds); SI sharps injury; EPINet Exposure Information Network; MSISS Massachusetts Sharps Injury Surveillance System; EXPO-S.T.O.P. Exposure Survey of Trends in Occupational Practice.

The recent rise in SI incidence is of urgent concern. The OSHA law is clear: employers and employees must strive to reduce exposures with the use of SED and staff training and must

review their exposure control plan annually in pursuit of exposure reductions.¹² But the 2016 and 2017 EXPO-S.T.O.P. surveys show, for many hospitals, that a renewed vigor is required. Workload, ineffective SED, low use of SED, and inadequate training are possible barriers,¹⁰ yet determined managers have shown that it is possible to bring about significant reductions in exposure incidence.^{13,14}

Fig 4. SI incidence trends 2000 – 2017 (FTE as denominator)



SI sharps injuries; FTE full time equivalent staff; EPINet Exposure Information Network; EXPO-S.T.O.P. Exposure Survey of Trends in Occupational Practice.

Conclusions.

- The significant rise in SI incidence with the 2016 and 2017 EXPO-S.T.O.P. surveys indicates that current national strategies have not been successful in reducing national SI rates.
- There is an urgent need to adopt more aggressive exposure-reduction strategies
- Large exposure databases, detailed databases of SI mechanisms, and research on SI mechanisms, SED effectiveness and effective training are required, as well as continued publication of strategies proven to reduce exposure incidence.

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