

Department/Unit: Environmental Health and Safety/Facilities Management and Services
Year: 2018
Contact Name: Marjorie Markopoulos, Ph.D.
Contact Title: Director, Environmental Health and Safety

UNIT OVERVIEW/MISSION/PURPOSE

Protecting People. Protecting our Community. Protecting our Planet.

The Department of Environmental Health and Safety (EHS) serves to ensure a safe and healthy environment for all students, employees, and visitors to Wright State University in support of the university's overall mission.

- EHS works to protect human health and, to the greatest extent possible, reduce the university's impact on the environment and surrounding ecosystem.
- EHS develops programs and policies designed to meet or exceed compliance with all applicable federal, state, and local laws, regulations and guidelines.
- EHS provides unparalleled customer service to the university and surrounding community.
- EHS accomplishes these goals through development and implementation of a comprehensive environmental health and safety management system that consists of a review of programs and policies, tracking performance metrics, information exchange, training, inspections, and continuous feedback.

MISSION

To provide our customers assurance that our safety and environmental programs will identify and mitigate hazards to promote healthier lives and a sustainable future.

VISION

Be a leader in providing a safe and healthy university community while preserving our natural resources and protecting our environment.

EHS BUDGET AND STAFFING LEVELS

The budget and staffing levels for FY16 through FY19 are listed in Table 1. The level of full-time EHS professional staff has decreased by 55% from 9 to 4. The total adjusted budget had a corresponding decrease of 51%. Both EHS staffing and budget levels may be estimated by a tool developed by another university safety professional, which compared multiple variables for the model equations. Three (3) relationships are used for these predictors, including:

1. Staffing model using non-lab square footage, lab square footage, presence of a medical or veterinary school, and presence of a BSL3 laboratory.
$$\#EHS\ FTE = e^{[(0.516 * School) + (0.357 * \ln(Lab\ NASF)) + (0.398 * \ln(Nonlab\ NASF)) + (0.371 * BSL)]} - 8.618]$$
2. EHS budget as related to campus square footage.
3. Proportion of extramural research expenditures.

The model indicates Wright State's EHS staff should be approximately 7.3, which is 82% higher than EHS's current staffing levels of 4 professionals.

The other models assist EHS budget targets by using campus net assignable square footage (NASF) or the proportion of extramural research expenditures. When NASF is used as a budget predictor, lab densities are used. Low lab density is defined as \$0.20 per total square foot with 5-15% of lab area to NASF and high lab density is defined as \$0.40 per total square feet with

approximately 20-35% lab area to NASF. In 2018, Wright State’s lab density was approximately 19%. When an index of \$0.29 per NASF is used, the budget model predicts \$697,786, which is 100% of FY17 budget of \$697,175. This remarkable target indicates our current budget may be reasonable when compared to other similar universities. However, the budget model by research expenditures yields \$288,400, which is only 41.3% of the FY17 budget. Changes in lab density, NASF, or research expenditures would have a direct effect on these budget models and targets.

Table 1. EHS Budget and Staffing Levels (FY16-FY19)

	FY16	FY17	FY18	FY19
# Full Time Staff	9	8	4	4
# Student Employee	1	1	0	2

SUCCESS OUTCOME 1: EHS

Minimizing exposure to health risks and protect the well-being of our Wright State University community.

EHS Total Spend, Adjusted Budget, Model Budget (based on Research), Model Budget (based on sq ft)

■ Total Spend
 ■ Total Adjusted Budget
 ■ Model EHS Budget by Research
 ■ Model EHS Budget by \$/sq ft
 ■ Number of Employees
 ■ \$ per NASF

Losses to Personnel

Reported accidents, incidents, and near-misses are lagging indicators used as a high-level benchmark. The reportable injuries are required to be reported annually to the state. Effectively reporting near-misses and reviewing the mitigating strategies are used to prevent potential serious accidents. Reporting near-misses also encourages employee participation.

KPI 1.1 NUMBERS OF ILLNESSES AND INJURIES SUBMITTED BY EMPLOYEES, RESIDENTS, STUDENTS COLLECTED BY INCIDENT REPORT SUBMISSIONS TO EHS

Result

The total number of Incident Reports submitted to EHS has decreased from a maximum of 154 in calendar year 2016 to 66 in calendar year 2018 (to December 9, 2018) for an overall decrease of 42%. According to the data, the number of incident reports for student employees is significantly lower than the number of incident reports filed by all other employees (faculty, adjunct faculty, and staff) ($p < 0.001$) for all years. The percent distribution of the incident reports by population type does not significantly vary year to year, but a 50% decrease of report submissions was observed between calendar years 2016 and 2017 from (156 to 77).

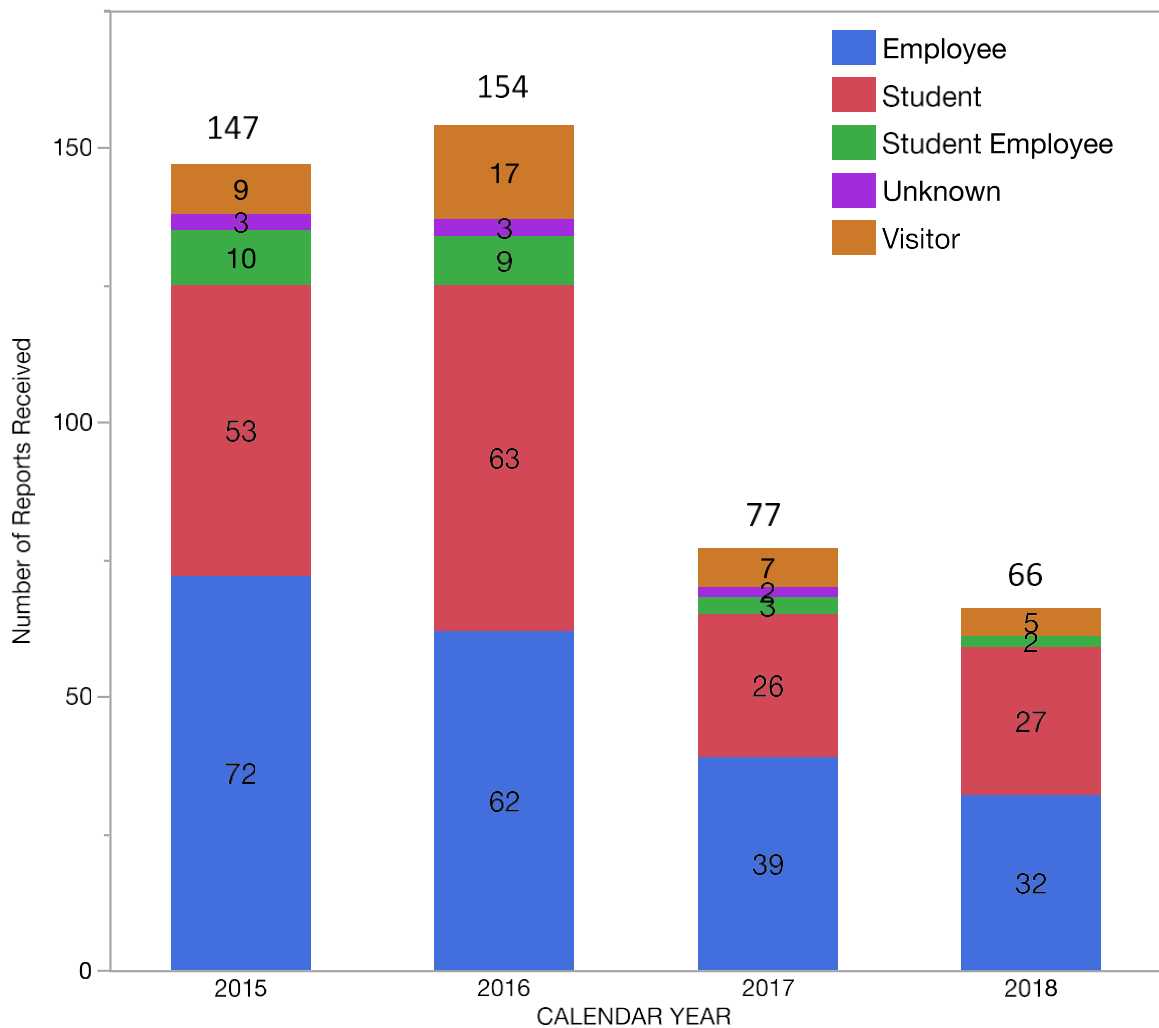


Figure 2. Annual number of Incident Reports submitted to EHS by population type (employee, student, student employee, visitor, or unknown). The number of incidents are included in the stacked bars by population type (blue-employee, red-student, green = student employee, purple – unknown or not recorded, and orange – visitor). The total number of incidents per year are indicated above each stacked bar.

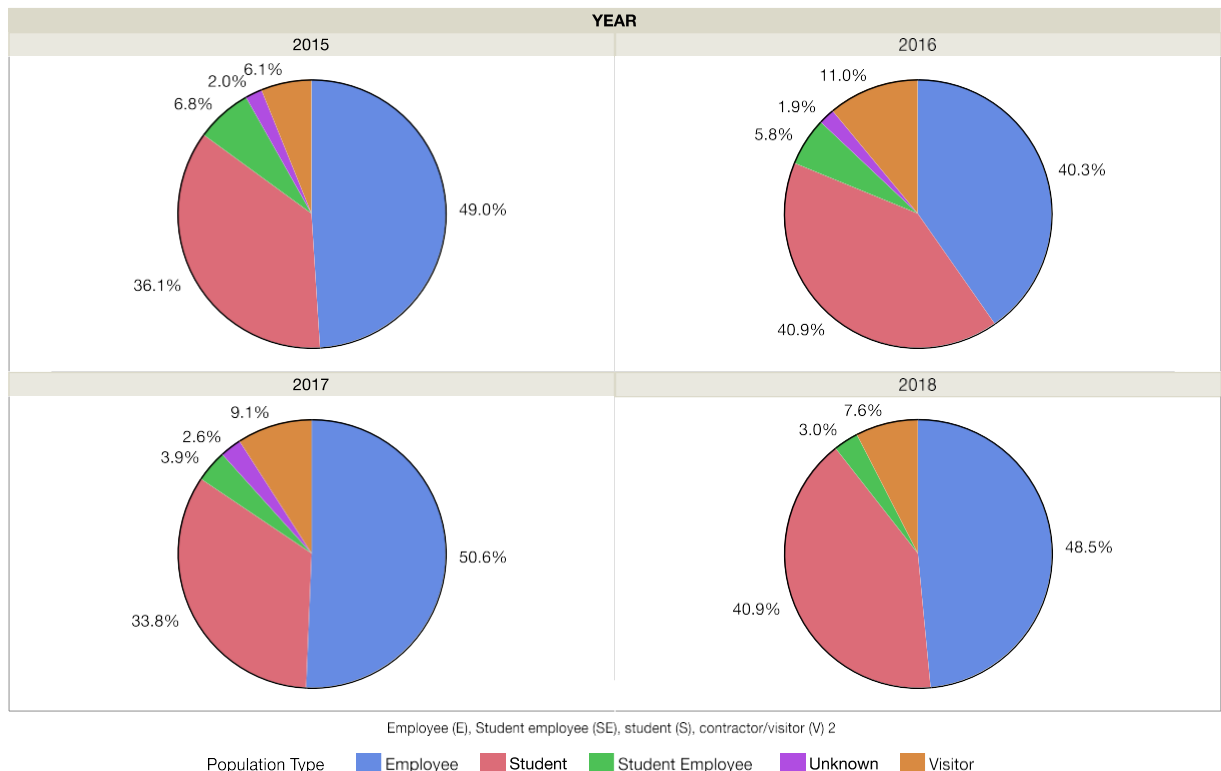


Figure 3. Percentage of incident reports submitted by each population type by year. The population types are indicated by color (blue – employee, red – student, green – student employee, purple – unknown or not recorded, and orange – visitor or contractor). Top left: Incident reports by % population type for 2015. Top right: Incident reports by % population type for 2016. Bottom left: Incident reports by % population type for 2017. Bottom right. Incident reports by % population type for 2018 (ending 12/8/2018). The population type with the largest percentage of submitted incident reports is for paid employees, including student employees and regular employees.

Response/Action Plan

The data suggests that the largest percentage of submitted incident reports are filed by employees and not students. This trend indicates that additional preventative measures should be geared to these paid populations and/or the type of incidents be evaluated to possibly identify trends in similar type injuries or job tasks.

KPI 1.2 OSHA RECORDABLE RATE VERSUS DART¹ RATE

The OSHA Recordable (Incident) Rate and DART rates are used to provide a snapshot of safety performance while using the actual hours worked as a base. This information is required by law to be reported and posted each year. The rates can be used to compare to others in similar industries. The Bureau of Labor Statistics (BLS) compiles average incident rates per industry for reference purposes.

Result

Incidence rates shows a count of reportable injury and illness cases and a summary of lost work days or days with restricted work related to those cases. Incident rates are an indicator of past performance (lagging indicators) and are not indicators of future performance (leading indicators). They are used throughout many sectors since they are standardized and can be effectively compared to other industries and agencies. Wright State out-performed both the BLS private industry and the universities NAICS sectors in nearly all injury/illness rates. These results

¹ Days Away Restricted or Transferred (DART) rate represents required days away from work or restricted duty/job transfer

indicate that when Wright State is compared to other universities, the incident rates are lower or not as many incidents occur for every 100 employees. In 2016, the DART was over the DART for other universities (0.3 vs. 0.458). The following year, the DART rate for Wright State decreased to zero.

The recordable incident rate is calculated by multiplying the number of recordable cases by 200,000, and then by dividing that number by the number of labor hours. The 200,000 number equates to 100 employees who work 40 hours per week, and who work 50 weeks per year. The rates for days away from work or cases with restrictions are similar calculations, using the number of number of days for the corresponding desired rate.

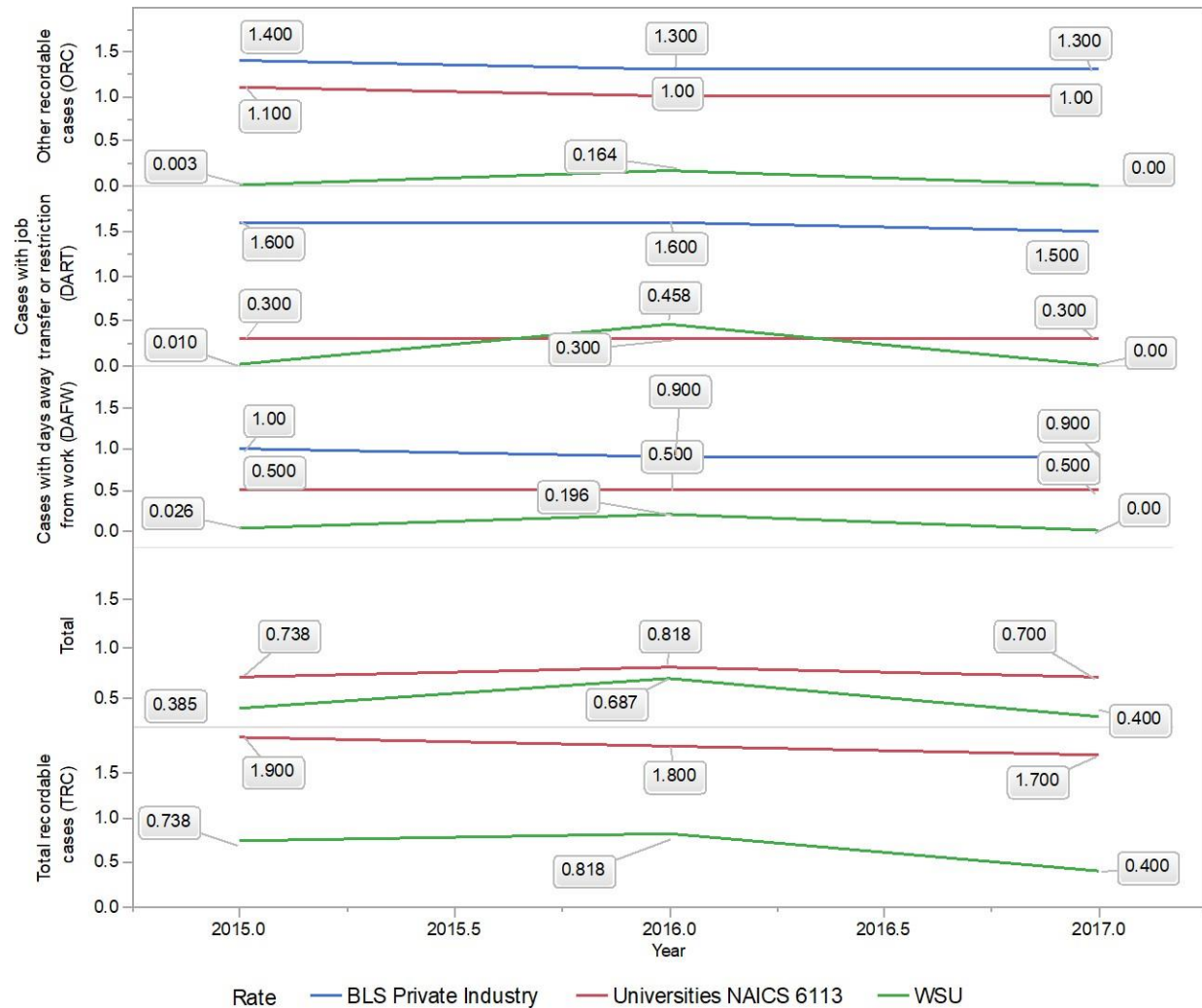


Figure 4, Annual Reported Injury/Illness Rates per 100 Full-Time Workers Compared to University Rates (NAICS 6113). Bottom Panel: Total recordable cases (TRC) compares Wright State (green) to other universities (red). Wright State's TRC have been lower each year from 2015 to 2018. The middle three panels show cases with days away from work, job restriction, or transfer. The panel labeled total shows the total cases with days away from work. The panel labeled Cases with days away from work (DAFW) includes data from BLS Private Industry (blue), Universities NAICS 6113 (red), and Wright State (green). Wright State's DAFW was lower each year when compared to the private industries and other universities. The panel labeled Cases with job transfer or restriction (DART) includes data from BLS Private Industry (blue), Universities NAICS 6113 (red), and Wright State (green). In year 2016, Wright State's DART was higher than other universities, but was lowered again in 2017. Top panel: Other recordable cases (ORC) show cases where no days away from work were required. Data included for ORC are from BLS Private Industry (blue), Universities NAICS 6113 (red), and Wright State (green). Wright State's ORC is lower each year when compared to BLS private industry and other universities.

Cases with days away from work, job restriction, or transfer

Response/Action Plan

Reporting of near misses and incidents should be encouraged by all employees, visitors, and students. Reporting is necessary to make more meaningful and appropriate conclusions from the data. The collected data suggests that Wright State continues to out-perform other universities and BLS private industries (as reported to BLS). Continued efforts to identify, eliminate, and mitigate hazards will assist in making Wright State a safe and healthy campus.

KPI 2.3 TYPES OF INJURIES

Result

The cause of the incidents for each calendar year (2015 through 2018) are shown in Figure 5. Slips, trips, and falls has the most number and percentage for the incident cause.

Wright State's causes of incidents can be compared to the top five events or exposure for 2017 for colleges and universities, according to BLS. These top five causes are listed below:

1. Overexertion and bodily reaction (32.0%)
2. Falls, slips, trips (25.7%)
3. Contact with object, equipment (23.1%)
4. Violence and other injuries by persons or animal (7.1%)
5. Transportation incidents (5.4%)

The percentage of incidents contributed to falls, slips, and trips ranges between 27-34%, which is slightly higher than the 25.7% incident rate for universities for 2017. Wright State did not report any incidents for overexertion and bodily reaction. This is likely due to the options available on the Excel spreadsheet used to compile the data.

The departments with greater than five incidents in the calendar years 2015 to 2018 are shown in Figure 6. Six out of the sixteen departments listed are Physical Plant or Facilities Operations units. The leading departments with the most incidents were Physical Plant, Intramurals, Nursing, and Theatre. The efforts to determine the increased number of incidents should target these departments and the corresponding causes to impart preventative measures. The leading causes for these identified departments show slips, trips, and falls, kinetic hazard, and obstruction (Figure 7).

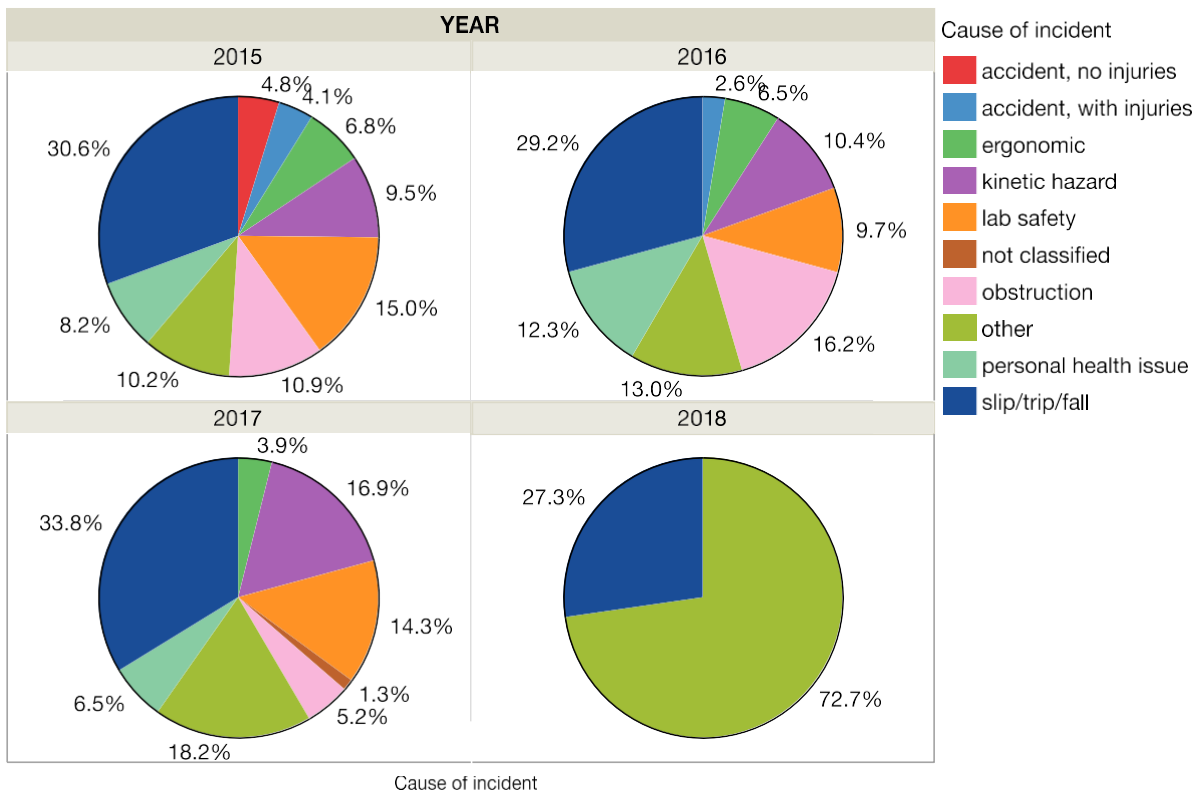
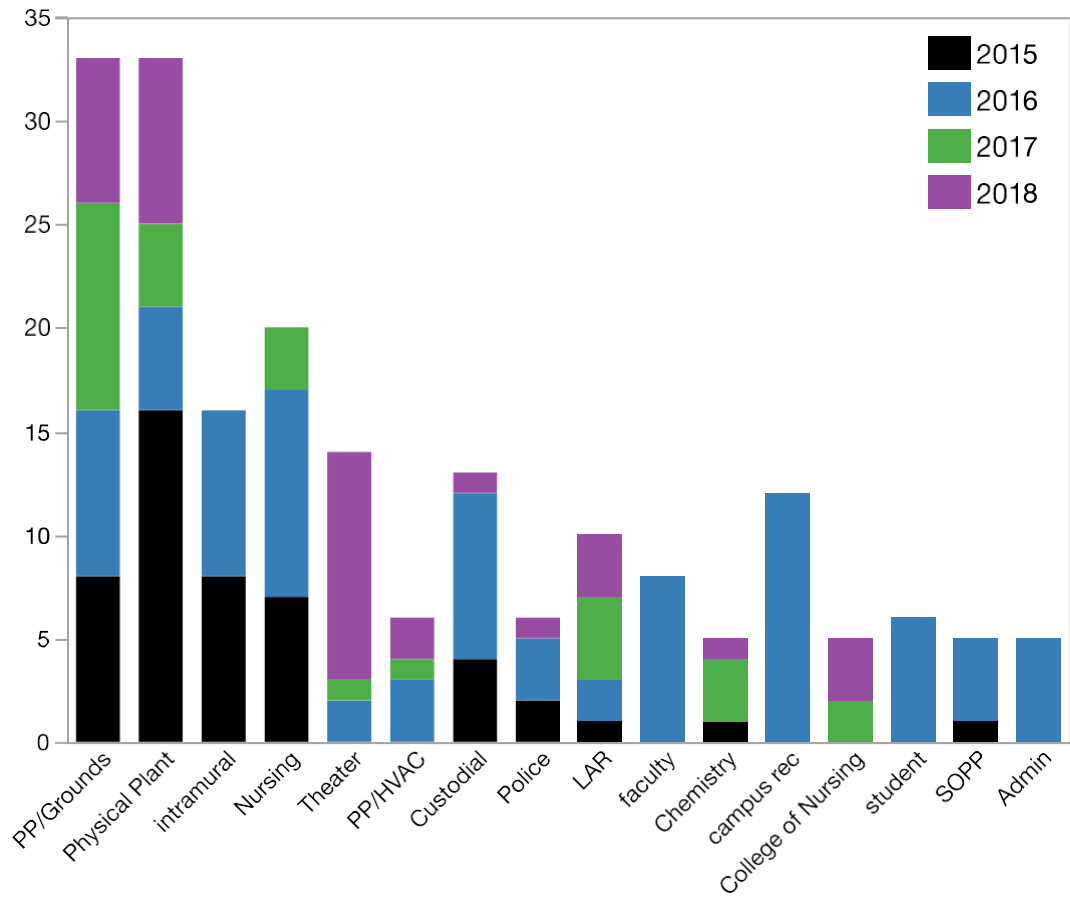
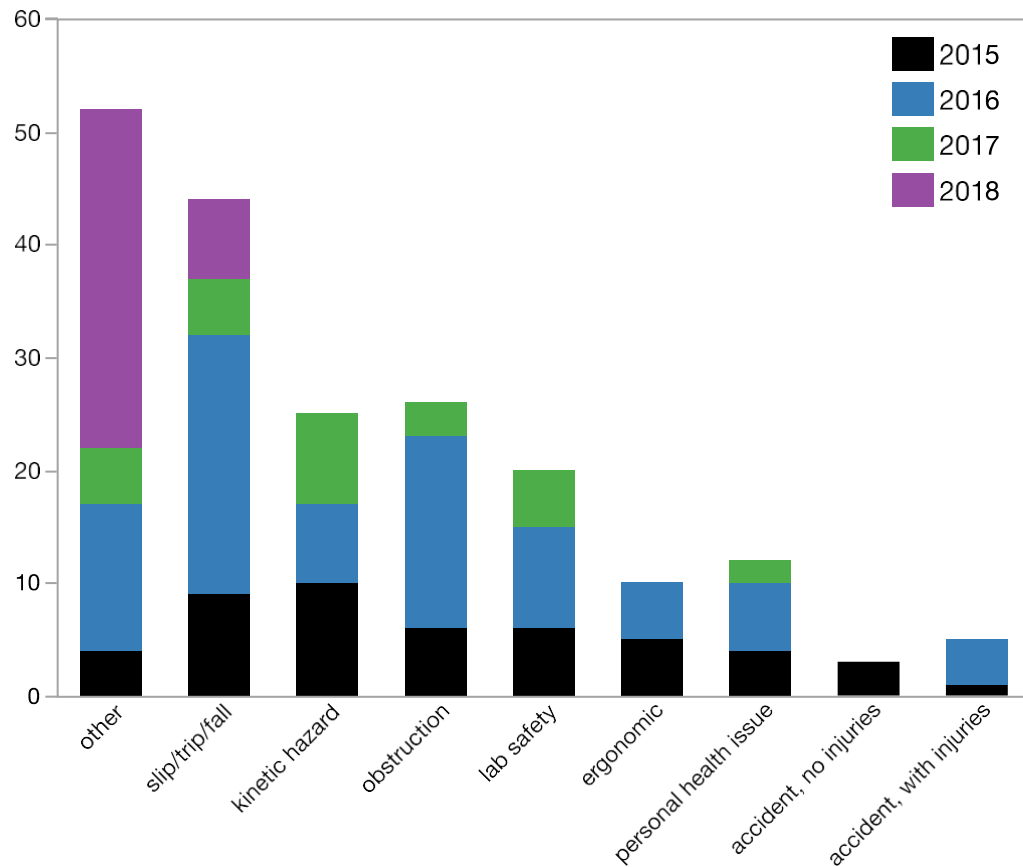


Figure 5. Pie charts for percentages causes of reported incidents by year. The causes of incident are identified by colors (red – accident, no injuries, light blue – accident, with injuries, bright green – ergonomic, purple – kinetic hazard, orange lab safety, brown – not classified, pink – obstruction, green – other, aqua – personal health issue, and dark blue – slip/trip/fall). Top left: 2015 causes of incidents. Top right 2016 causes of incidents. Bottom left: 2017 causes of incidents. Bottom right: 2018 causes of incidents.



Department ordered by Count (descending)

Figure 6. Departments with greater than 5 incidents during calendar years 2015 to 2018. The bar graphs are stacked by year (2015-black, 2016-blue, 2017-green, and 2018-purple). The Department axis is ordered by the descending number of incidents reported by department. Physical Plant (Facilities Operations) has reported the most incidents each year.



Cause of incident ordered by Count (descending)

Figure 7. Causes of incidents for the departments with greater than 5 incidents during 2015 to 2018. The graph displays the causes of incidents by descending numbers of incidents reported. The bars are stacked by year (2015-black, 2016-blue, 2017-green, and 2018-purple). The overall cause of incidents was listed as “other” followed by slip/trip/fall.

Response/Action Plan

The data suggests that Physical Plant or Facilities Operations employees are more likely to report or experience an incident and the slips, trips, and falls, is the most likely type of incident. Efforts to continue to identify hazards will help prevent occupational injuries and illnesses. Reporting of near misses and incidents should be encouraged by all employees, visitors, and students. More reporting makes data more meaningful and can assist making appropriate conclusions from the data. The methods for evaluating and classifying the information should be standardized and defined to ensure data reporting is consistent.

CONCLUDING REMARKS

Environmental Health and Safety (EHS) serves to protect the university’s resources, including its community, facilities, and the environments. The department’s professional staff of four provides over 100 years of expertise to over 60 different legal and regulatory requirements. Examples of these requirements include the following: air emissions, stormwater discharge, hazardous and universal wastes, emergency planning and community-right-to-know reporting and release information, spill reporting, health and safety, water quality, and public health. In general, EHS departments utilize many key performance metrics for both regulatory and performance

activities. For regulatory purposes, key indicators include frequency and severity of reported illnesses and injuries, regulatory compliance, finances, and customer satisfaction. Examples of these metrics include pounds of hazardous waste, if a person was trained, or if a person was hurt. For performance metrics, the number of pick-ups, the effectiveness of training, and root cause analysis of accidents and injuries. Currently, EHS tracks many of these metrics manually, without the aid of automated software or technologies. Future implementation of appropriate EHS management system tools would enable the collection, analysis, and reporting of many of these metrics. The key indicators for success for personnel losses in this report showed the well-training, limited staff provided a level of service to meet or exceed the safety and compliance requirements of the university.

RESOURCES

Backus, B., Patlovich, S. (2018). Key EH&S Performance Indicators and Metrics for Senior Management in Higher Education [PowerPoint slides]. Retrieved from https://www.mhec.org/sites/default/files/resources/20180309_EMS6_EHS_Program_Performance_Indicators.pdf. (visited 12/9/2018).

Bureau of Labor Statistics, U.S. Department of Labor, Industry and Illness Data – 2017 Summary Table. Retrieved from https://www.bls.gov/iif/oshwc/osh/os/summ1_00_2017.xlsx. (visited 12/9/2018).

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APPENDIX

KPI 1.1 Data

The data used to determine the effect of losses to personnel is outlined in Table 2 – Data collected for Injury and Illness Reporting.

Table 2. Data Collected for Injury and Illness Reporting

Who	What	When	How	Operational Definitions
EHS	Incident reports	January 1 to December 31	Sum total of EHS Incident Reports	Any incident reported to EHS
Human Resources	Estimated total population	January 1 to December 31	PERRP Employee Count Report provided by Human Resources	Faculty FT, Faculty PT, Faculty Adjunct, Staff FT, Staff PT, Student
Human Resources	Number of Staff	January 1 to December 31	PERRP Employee Count Report provided by Human Resources	Faculty FT, Faculty PT, Faculty Adjunct, Staff FT, Staff PT, Student
Human Resources	Number of Students	January 1 to December 31	PERRP Employee Count Report provided by Human Resources	Faculty FT, Faculty PT, Faculty Adjunct, Staff FT, Staff PT, Student
Human Resources	Number of Faculty	January 1 to December 31	PERRP Employee Count Report provided by Human Resources	Faculty FT, Faculty PT, Faculty Adjunct, Staff FT, Staff PT, Student

KPI 1.2 Data

Description of data collected (e.g., who, what, when, how, any operational definitions)

Table 3. Description of data required to determine incidence rates.

Who	What	When	How	Operational Definitions
EHS	OSHA Recordable Incident	Annual January 1 to December 31	Review of EHS incident reports	Any work-related fatalities, amputations, loss of consciousness, injury and/or illness resulting in lost time or restricted days from work. Also, any work-related injuries

				or illnesses that result in treatment more than first aid.
Human Resources	Hours worked per year	Annual January 1 to December 31	Email to request annual PERRP Hours Report	Faculty FT, Faculty PT, Faculty Adj, Staff FT, Staff PT, Student
EHS	Best in class rates	Annual January 1 to December 31	Bureau of Labor Statistics	Bureau of Labor Statistics Universities NAICS 6113. Other industry leaders include Corning, DuPont, and Dow.

KPI 1.3 Data

Description of data collected (e.g., who, what, when, how, any operational definitions)

Table 4. Data collection to determine types of occupational incidents and illness

Who	What	When	How	Operational Definitions
EHS	OSHA Recordable	Annual January 1 to December 31	Review of EHS incident reports	Recordable cases per 200,000 hours worked
EHS	Injury metric	Annual January 1 to December 31	Review of EHS incident reports	Type, location, department, employee classification