

January 2015

Safety Climate And Healthcare Worker Injury Rates

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Safety Climate and Healthcare Worker Injury Rates

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May 1, 2015

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ABSTRACT:

BACKGROUND: Safety climates that support safety-related behavior are associated with a fewer work-related injuries, and prior research in industry suggests that safety knowledge and motivation are strongly related to safety performance behaviors; this relationship is not well studied in healthcare settings. **METHODS:** We performed analyses of survey results from a Veterans Health Administration (VHA) Safety Barometer employee perception survey, conducted among VHA employees in 2012. The employee perception survey assessed six safety program categories, including management participation, supervisor participation, employee participation, safety support activities, safety support climate, and organizational climate. We examined the impact of safety climate from the survey results on VHA employee injury and illness rates.

RESULTS: Of the six safety program categories, VHA work-related injury and illness rates were significantly and inversely related to employee perception of supervisor participation and safety support climate. Among VHA facilities in The VA New England Healthcare System, work-related injury rate was significantly and inversely related to overall employee perception of safety climate, and all six safety program categories, including employee perception of employee participation, management participation, organizational climate, supervisor participation, safety support activities, and safety support climate.

CONCLUSIONS: Employee perceptions of superior safety climates in VHA facilities are associated with lower work-related injury and illness rates. Of the safety culture determinants analyzed, VHA supervisor participation and safety support climate were identified as the elements most strongly associated with work-related injury rates. Future implications may include improving supervisor participation and safety support climate in the VA healthcare system to reduce employee injury rates.

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BODY OF THESIS:

INTRODUCTION:

1.1 Objectives of Investigation:

While previous research has demonstrated positive patient safety outcomes associated with improved hospital and healthcare safety culture, the association between safety climate in healthcare settings and employee injury outcomes is less clear¹. We describe the relationship between employee perceptions of healthcare safety climate and employee injuries and illnesses at the Veterans Health Administration, and we identify safety climate factors that are most predictive of employee injuries and illnesses. Because evidence suggests that safety climate is associated with safety-related behaviors, improving safety climate through leadership and organizational policies may provide an avenue for injury and illness prevention in healthcare.

1.2 Safety Culture and Safety Climate

Safety culture encompasses “the shared values, beliefs, norms, and procedures related to safety among members of an organization”², while safety climate refers to the perceptions and behaviors of a workforce with respect to relative importance of safety within the organization³. Organizations with robust safety climates prioritize safety-related behaviors and incorporate these behaviors into the daily operations among individuals, units, and teams within an organization⁴⁻⁶. Superior safety climates that emphasize safety-related behaviors and safety performance are associated with fewer occupational injuries⁷⁻⁹. Safety climate is believed to not only be predictive of workplace injuries, but conversely, workplace injuries also gauge the safety climate of an organization^{8,10}. In effect, employees’ awareness of workplace injuries and illnesses will direct adherence to and appreciation for safety-related policies, procedures, and

practices in an institution⁸. The relationships between safety climate and employee injury can therefore be regarded as recursive.

1.3 Review of Studies Relevant to Current Problem

Existing research concentrating on safety climate in healthcare settings is limited. Studies that have focused on employee injury outcomes in healthcare suggest that poor organizational climate and high workloads are associated with increases in healthcare worker injuries, including needlestick injuries and near-misses to hospital nurses^{11,12}. Nevertheless, much of the emphasis on hospital and healthcare safety climate to date has concentrated on patient safety-related outcomes and strategies to improve patient safety rather than employee safety^{2,13}. Previous studies investigating hospital and healthcare safety climate demonstrate fewer patient-related adverse events and patient mortality associated with superior hospital safety climates^{1,14}.

1.4 Anticipated Growth and Work-Related Injuries within the Healthcare Industry

The healthcare and social assistance industry is currently the largest employer in the United States, and in April 2015, healthcare was estimated to provide 18.3 million jobs for wage and salary workers nationwide¹⁵. As patient technology advances, and the population continues to age, healthcare employment will continue to increase. The Bureau of Labor Statistics (BLS) estimates that the healthcare industry will generate approximately 3 million new wage and salary jobs between 2006 and 2016¹⁶. Yet, healthcare has concurrently become the industry with the leading incidence rate of Occupational Safety and Health Administration (OSHA)-recordable injuries and illnesses among all industries in the United States¹⁷. In 2013, the BLS estimates that there were 4.7 total OSHA recordable injury and illnesses per 100 full-time workers among the healthcare and social assistance industry¹⁸. Additionally, the healthcare and social assistance

industry reported the most nonfatal injuries and illnesses resulting in days away from work in 2011¹⁷. Although illness and injury incidence rates are largely declining among all industries in the United States, injuries among the healthcare and social assistance industry are declining at a slower rate than other leading hazardous industries¹⁷.

Musculoskeletal disorders constitute the majority of healthcare worker injuries that result in days away from work¹⁷. Such injuries commonly result from movements related to patient handling, including lifting, repositioning, and patient transfers¹⁹. According to the BLS statistics from 2013, more musculoskeletal injuries are suffered by orderlies, attendants, nurses and nursing aides than workers in any other industry²⁰. Administrative and engineering controls, including equipment to facilitate transfers, minimal-lift policies, and dedicated lift teams, have been developed to address the hazards inherent to patient handling¹⁷. Nonetheless, sound safety and health management is instrumental in promoting safety-related behaviors and implementing such controls to handle both the hazards of patient handling and those of other healthcare-related occupational hazards.

1.5 An Overview of the Veterans Health Administration

The United States Department of Veterans Affairs – Veterans Health Administration (VHA) is the largest, and one of the most technologically advanced integrated health care systems in the United States²¹. The Department of Veterans Affairs was estimated to have 312,841 full-time equivalent employees in 2013²², with the majority employed within the VHA²³. The VHA delivers health care to approximately 8.92 million veteran patients annually, with over 150 medical centers, and nearly 1,400 community-based outpatient clinics, community living centers, Vet Centers and Domiciliaries among its operations^{21,24}.

The VHA structure is regionally divided into 21 different health system networks, referred to as Veterans Integrated Service Networks (VISNs). VISNs are comprised of medical centers, community service programs, and community-based outpatient clinics, usually across multiple states within a geographic region²¹ (Appendix 1).

1.6 Hypothesis

We hypothesize that superior employee safety climates are associated with lower occupational illness and injury rates in healthcare.

RESEARCH DESIGN:

2.1 Safety Perception Survey Instrument:

The Safety Barometer was developed by the National Safety Council (NSC), a non-governmental, not-for-profit membership organization, to provide organizations a perspective on how their safety climate compares with those of other organizations in various industries²⁵.

The NSC Safety Barometer employee perception survey contained a total of 50 statements related to safety climate, incorporating six fundamental safety program categories: management participation, supervisor participation, employee participation, safety support activities, safety support climate, and organizational climate. Employees who participated in the Safety Barometer employee perception survey were asked to indicate their level of agreement or disagreement with the 50 safety and work-related statements. Each safety climate statement used a 5-point, neutral mid-point Likert scale (“strongly disagree”=-2 to “strongly agree”=+2), with both positively-phrased and negatively-phrased statements. The survey also contained three demographic questions, targeting employment category, VISN, and VHA facility within the VISN.

The NSC Safety Barometer employee perception survey was disseminated to participating facilities VHA-wide in the fall of 2012 to measure employee perception of safety climate in VHA facilities. VHA responses from the NSC Safety Barometer employee perception survey, conducted in the fall of 2012, were compared with responses from the 495 participating organizations in the NSC database to produce comparative percentile values. From the NSC Safety Barometer analysis of program components, “a percentile score expresses the percentage of [NSC database] companies with a lower average response score than VHA. Possible percentile scores range from 0 to 100, with 0 representing the lowest score in the [NSC database] and 100 representing the highest.” The survey was computer-based and was distributed via electronic mail to all VHA employees in the fall of 2012. Participation in the employee safety perception survey was voluntary for all employees, and all responses were anonymous.

We were provided percentile scores for each question and safety program category, in addition to an overall percentile score for all of the 21 VISNs. We were also supplied overall percentile scores for the 177 VHA facilities among the 21 VISNs. We were lastly provided percentile scores for each question and safety program category, in addition to an overall percentile score for all 10 VHA facilities among VISN1: The VA New England Healthcare System, which incorporates the VA Connecticut Healthcare System.

2.1 Study Sample:

Employees from the Department of Veterans Affairs – Veterans Health Administration facilities, representing 177 VHA facilities and 21 VISNs, completed the National Safety Council (NSC) Safety Barometer employee perception survey in the fall of 2012, to measure employee perception of safety climate in VHA facilities.

2.3 Employee Injury Incidence Rates:

Employee injury incidence rates were obtained using the Automated Safety Incident Surveillance and Tracking System (ASISTS), the safety incident management system for employees in the VHA. The ASISTS data repository includes all employee injuries and illnesses reported at VHA facilities, including both OSHA-recordable and nonrecordable injuries and illnesses. OSHA-recordable injuries and illnesses comprise those that result in death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, loss of consciousness, or a significant injury or illness diagnosed by a physician or other licensed healthcare professional. However, employee illnesses and injuries entered into the ASISTS database also include those that do not fulfill the aforementioned criteria, such as an injury that only requires first aid. This study reviewed ASISTS data for all employee injuries and illnesses during fiscal year 2012 (September 1, 2011 through August 31, 2012) and fiscal year 2013 (September 1, 2012 through August 31, 2013). All employee work-related injury and illness data were anonymous.

Employee injury information obtained from the ASISTS database included the number of injuries and illnesses for fiscal years 2012 and 2013 by VISN and by VHA medical center facility. The injury data were presented as standardized incident injury rates per 10,000 full-time equivalent workers, and were calculated as follows:

$$\text{Incident Rate} = \frac{N}{EH} \times 20,000,000,$$

where N = the number of injuries and illnesses, EH = the total hours worked during the calendar year, and 20,000,000 = the base for 10,000 full-time equivalent workers (working 40 hours per

week, 50 weeks per year). The Bureau of Labor Statistics similarly utilizes a similar formula to calculate annual injury and illness rates among other industries²⁶.

2.4 Methods of Statistical Analysis:

All analytical techniques were performed using SAS statistical software (SAS v9.3, SAS Institute Inc., Cary, North Carolina). Simple linear regression models were used to describe the association between employee injury rate, a continuous explanatory variable, and percentile score, a continuous response variable.

We analyzed unadjusted linear regression models of aggregate VISN percentile scores and standardized injury rates by VISN, first by examining the impact of overall VISN percentile score on VISN standardized injury rate, and then by stratifying by the VISN percentile scores for the six program categories of safety climate. After stratifying by the program categories of safety climate, we examined the impact of each VISN program category percentile score on VISN standardized injury rate.

Similarly, we next analyzed unadjusted linear regression models of individual employee safety perception survey results, averaged by VISN, and standardized injury rates by VISN, first by examining the impact of overall average VISN employee response (based on the Likert scale results) on VISN standardized injury rate. We then again stratified the survey results by the six program categories of safety climate and examined the impact of each on VISN standardized injury rate.

We subsequently analyzed unadjusted linear regression models of aggregate VHA facility percentile scores and standardized injury rates by facility, by examining the impact of overall VHA facility percentile score on VHA facility standardized injury rate. Lastly, we examined

unadjusted linear regression models of aggregate VHA facility percentile scores and standardized injury rates by facility within VISN1: The VA New England Healthcare System, first by examining the impact of overall VISN1 facility percentile score on VISN1 facility standardized injury rate, and then again stratifying by the percentile scores for the six program categories of safety climate, and examining the impact of each on VISN1 facility standardized injury rate.

A backward elimination selection method was then used to identify the employee safety survey questions in the full model that were most predictive of employee injury rates at an alpha level of 0.05.

PRESENTATION AND ANALYSIS OF FINDINGS:

3.1 Safety Survey Participants

In total, the NSC Safety Barometer employee perception survey was completed by 27,368 employees VHA-wide in the fall of 2012. It was estimated in 2008 that the Veterans Health Administration employed 247,113 workers²³, therefore this represents a response rate of approximately 11%. Of those who completed the survey and for whom employment category was recorded, 6.2% were from management (n = 1,683), 10.3% were supervisors (n = 2,770), 82.4% were employees (n = 22,259), and 0.1% were contractors (n = 298).

3.2 Safety Survey Results among All VHA Facilities and VISNs:

The NSC Safety Barometer was completed by employees at 177 VHA facilities. The overall percentile score nationwide across the VHA was 53. VHA-wide overall percentile scores for the 50 component statements ranged from 21 to 82. VHA-wide percentile scores for the six program

categories ranged from 44 for management participation to 60 for both supervisor participation and safety support activities.

3.3 Employee Injury Incident Rates among All VHA Facilities:

We further analyzed standardized injury rates for 140 VHA facilities nationwide. The average standardized injury rate among all VHA facilities was 947 recorded injuries and illnesses per 10,000 full-time equivalent workers (range 259-2,110). There were 7 VHA facilities for which standardized injury rate data was missing, and 30 facilities (including VISN headquarters) for which facility injury rate was not recorded.

3.4 Percentile Scores and Aggregate Standardized Injury Rates by VISN

The overall Safety Barometer percentile scores among all 21 VISNs ranged from 14 to 73. Analyzing by VISN aggregate percentile scores, work-related injury rate was not significantly associated with employee perception of safety climate ($p=0.1168$). Work-related injury rate *was* however significantly and inversely related to employee perception of safety climate, when analyzing individual employee survey results by VISN ($\beta=-0.748$; $p < 0.0001$; $r^2 = 0.014$).

3.5 Safety Climate Program Categories and Aggregate Standardized Injury Rates by VISN

Upon evaluating the six program categories of safety climate, analyzing by VISN aggregate percentile scores (Table 1), work-related injury rate was significantly and inversely related to employee perception of supervisor participation ($\beta=-2.018$; $p=0.0002$; $r^2=0.065$) and safety support climate ($\beta=-0.762$; $p= 0.0478$, $r^2= 0.013$). An inverse, albeit nonsignificant, relationship between VHA work-related injury rates and employee participation, management participation, organizational climate, and safety support activities was observed.

Using individual employee survey results by VISN (Table 2), work-related injury rate was significantly and inversely related to employee perception of safety support climate ($\beta=-0.694$; $p=0.0022$; $r^2=0.0009$). Unexpectedly, work-related injury rate increased in relation to improvement in other safety program categories, such as organizational climate, and supervisor participation. An inverse, albeit nonsignificant, relationship between VHA work-related injury rates and employee participation, management participation, and safety support activities was observed.

3.6 Percentile Scores and Aggregate Standardized Injury Rates by VHA Medical Center Facility

The overall Safety Barometer percentile scores across the VHA medical center facilities ranged from 7 to 98. Work-related injury rate was not significantly associated with overall employee perception of safety climate, when analyzing by VHA facility overall percentile scores (Figure 1, $p=0.2225$).

3.7 Percentile Scores and Aggregate Standardized Injury Rates by VHA Medical Center Facility among VISN1: The VA New England Healthcare System

The overall Safety Barometer percentile scores among VISN1 medical center facilities ranged from 11 to 68. Analyzing VISN1 facility percentile scores (Figure 2), work-related injury rate was significantly and inversely related to overall employee perception of safety climate ($\beta=-13.613$; $p=0.0002$; $r^2=0.626$).

Upon further evaluation of VISN1 facility percentile scores (Table 3), work-related injury rate was significantly and inversely related all six safety program categories, including employee perception of employee participation ($\beta =-8.641$; $p <0.0001$; $r^2=0.244$), management participation ($\beta =-9.097$; $p <0.0001$; $r^2=0.270$), organizational climate ($\beta =-7.089$; $p=0.002$,

$r^2=0.190$), supervisor participation ($\beta = -10.015$; $p < 0.0001$, $r^2=0.293$), safety support activities ($\beta = -9.077$; $p < 0.0001$, $r^2=0.280$), and safety support climate ($\beta = -8.920$; $p < 0.0001$, $r^2=0.240$).

3.8 Percentile Scores and Aggregate Standardized Injury Rates by Employee Type and Safety Program

Lastly, among the safety program categories, work-related injury rate was significantly associated with organizational climate among supervisors ($p=0.0244$) and employees ($p=0.0012$). In both models however, the variability in work-related injuries explained by the model was low (supervisors $r^2=0.0064$, employees $r^2=0.0004$). Work-related injury rate was not associated with any of the safety program categories among any of the other employee types.

CONCLUSIONS:

4.1 Summary of Findings:

Findings from this study of employee perception of safety climate and employee injury rates suggest that employee perception of superior safety climates may be associated with lower occupational illness and injury rates in the healthcare setting; however, results from the analyses were conflicting. Work-related injury rate was not significantly associated with to employee perception of safety climate, when analyzing by aggregate VISN percentile scores, but *was* significantly and strongly inversely related to employee perception of safety climate, when analyzing compiled VISN individual employee survey results ($r^2=0.6255$). Evaluation of the model of safety climate and employee injury rate, using compiled individual employee survey results, demonstrated a significant inverse relationship between the two variables ($\beta = -0.748$, $p < 0.0001$). However, very little of the variability in employee injury experience across VISNs was explained by the individual employee survey results ($r^2=0.014$). Similarly, the models

among safety program categories and employee injury rate, using the compiled individual employee survey results, demonstrated a statistically significant inverse association between injury rate and safety support climate, but again, the low r^2 value ($r^2=0.0009$) indicated a poor model fit.

Upon analyzing the safety program categories using VISN aggregate percentile scores, work-related injury rate was significantly and inversely related to employee perception of supervisor participation and safety support climate. Findings of an inverse relationship between work-related injuries and employee perception of supervisor participation and safety support climate are consistent with prior literature in other industries²⁷. In agreement with earlier research, supervisor behaviors related to accident prevention and involvement in promoting workgroup safety aids in the creation of a robust safety climate^{27,28}. Prior studies also suggest that a safety climate with higher climate perception of supervisor involvement is associated with fewer injuries²⁹. Moreover, during our analysis of VHA facilities within VISN1, work-related injury rate remained significantly and inversely associated with supervisor participation and safety support climate, thus providing further support for the importance of such factors in the development of a strong safety climate.

Not only did supervisor participation and safety support climate demonstrate a significant inverse association to employee injury rates among VHA facilities within VISN1, but the remainder of the categories, including employee participation, management participation, organizational climate, and safety support activities were also significantly and inversely associated with work-related injury rates. Again, several of these factors, notably management commitment to safety and organizational climate, are associated with improved accident and injury outcomes in current literature^{29,30}.

Interestingly, among the safety program components and employment categories, work-related injury rate was significantly and inversely associated with organizational climate among both supervisors and employees. Although very little of the variability in injury experience was explained by organizational climate among different employment categories in our models, the results again are consistent with prior findings in other industries. Specifically, worker perception of supportive organizational management has been associated with improved safety outcomes and declining work-related injuries. When employees perceive that management is flexible and involved in developing safety-related procedures and programs, work-related injury rates decline³¹.

4.2 Limitations:

This study does have many limitations. First, we can only define and describe associations between safety climate percentile scores and employee injury rates. Because of the ecologic nature of this study design, the data obtained are representative of a group, and characterize data from only one point in time. We therefore recognize that a temporal, and ultimately a cause and effect relationship, cannot be inferred from the results. Moreover, utilizing aggregate data from VHA facilities and VISNs subjects our findings to the ecological fallacy, by which associations between safety climate and employee injury rate at the aggregate VHA facility or VISN level do not necessarily apply at the individual level. In essence, we indeed identified that statistically significant associations between percentile scores among safety program categories and employee injury rates at the aggregate level many times did not persist when analyzed at the individual VHA facility level.

Another limitation of this study is the low overall employee response rate. As of September 2008, the Veterans Health Administration employed 247,113 workers, and that number continues to increase²³. Given that 27,368 individuals completed the survey, this represents a response rate of no more than 11%. In this instance, nonresponse bias may be introduced if those who responded to the survey experienced different injury and illness patterns than those who did not respond.

In addition, safety climate questionnaires that have been developed for the healthcare industry focus on various dimensions of safety climate, without consensus on the number of factors needed to assess safety climate or the scales upon which these variables are assessed³². Although many of the safety climate surveys available from the literature or websites target similar safety climate factors, such as management participation, the components measured in each survey are left to the discretion of the researcher. Furthermore, most safety climate surveys in general industry have not been tested for structure, reliability and validity³. Future research in the field of safety climate in healthcare should concentrate on validated and reliable questionnaire metrics.

4.3 Strengths:

Despite its limitations, the study design presented has several strengths. The study sample included employees among the largest integrated healthcare network from all regions of the nation with varying safety climate perception and employee injury experiences. In addition, the survey sample was large, and encompassed workers from all employment categories at all types of VHA facilities (e.g. VISN headquarters and tertiary care medical centers).

Furthermore, the safety perception instrument used in this study evaluates six fundamental safety program categories of safety climate, including management participation, supervisor

participation, employee participation, safety support activities, safety support climate, and organizational climate. Prevailing safety climate literature has focused on measuring several common factors inherent to safety climate, including management commitment to safety, safety systems, risk, work pressure, and competence⁸. A number of those variables that assess safety climate, including management commitment to safety and safety systems, were utilized in the NSC Safety Barometer employee perception survey.

4.4 Conclusions:

This study suggests that employee perception of superior safety climates in healthcare may be associated with lower occupational illness and injury rates. The outcomes of this study suggest that supervisor participation, including leadership commitment to safety, and safety support climate are important features of a solid safety climate, and may be associated with fewer work-related injuries in healthcare workers.

4.5 Recommendations for Future Research:

Future studies should include further exploration of the VHA ASISTS database, including relationships between safety climate and OSHA-recordable illnesses and data identifying employee injury type. Results from VISN1 are encouraging and reflect an inverse association between safety climate and injury rate. It would therefore also be beneficial to obtain additional safety survey results for VISNs other than VISN1, to identify whether such a relationship persists among other regions. Moreover, as noted above, the survey involved workers at all types of VHA facilities, both of high and low complexity and acuity. Understanding that sites of high acuity are inherently more hazardous, it would be valuable to identify how safety climate and injury rates compare across sites of varying complexity and acuity. Finally, a principal limitation

of this investigation was our inability to infer a temporal relationship between safety climate and injury experience given our survey results from one time point. The NSC Safety Barometer employee perception survey was again conducted in the fall of 2014, and while the results from that survey are still pending, future endeavors might compare 2012 and 2014 data. Comparing the survey data from 2012 and 2014 allows for identification of patterns in both employee safety perception and injury experience over two years rather than at just one point of data collection.

Table 1. Unadjusted Linear Regression Analyses of Work-Related Injury and Illness Rates by Overall Percentile Score and by Safety Program Category, Using Aggregate VISN Survey Results (n=21)

Covariate	β	<i>p</i>
Overall Score*	-2.81903	0.1168
Employee Participation (EP)	-0.401162	0.1509
Management Participation (MP)	-0.8117474	0.0729
Organizational Climate (OC)	-1.3620267	0.0630
Supervisor Participation (SP)	-2.018294	0.0002
Safety Support Activities (SSA)	-0.5254964	0.1121
Safety Support Climate (SSC)	-0.7618225	0.0478

*Overall Score = $f(EP, MP, OC, SP, SSA, SSC)$

Table 2. Unadjusted Linear Regression Analyses of Work-Related Injury and Illness Rates by Average Score and by Safety Program Category, Using Compiled VISN Individual Employee Survey Results

	Covariate	β	<i>p</i>
	Average Score*	-0.748	<0.0001
Safety Category	Employee Participation (EP)	-0.10997	0.3367
	Management Participation (MP)	0.42798	0.0997
	Organizational Climate (OC)	0.61115	0.0161
	Supervisor Participation (SP)	0.54315	0.0035
	Safety Support Activities (SSA)	-0.06794	0.3901
	Safety Support Climate (SSC)	-0.69395	0.0022

* Average Score = $f(EP, MP, OC, SP, SSA, SSC)$

Table 3. Unadjusted Linear Regression Analysis of Work-Related Injury and Illness Rates by Overall Percentile Score and by Safety Program Category, among All VHA Facilities in VISN1 (n=10)

	Covariate	β	<i>p</i>
	Overall Score*	-13.613	0.0002
Safety Category	Employee Participation (EP)	-8.641	<0.0001
	Management Participation (MP)	-9.097	<0.0001
	Organizational Climate (OC)	-7.089	0.002
	Supervisor Participation (SP)	-10.015	<0.0001
	Safety Support Activities (SSA)	-9.077	<0.0001
	Safety Support Climate (SSC)	-8.92	<0.0001

*Overall Score = $f(EP, MP, OC, SP, SSA, SSC)$

Figure 1. Work-Related Injury and Illness Rate and Overall Percentile Score among All VHA Facilities (n=140)

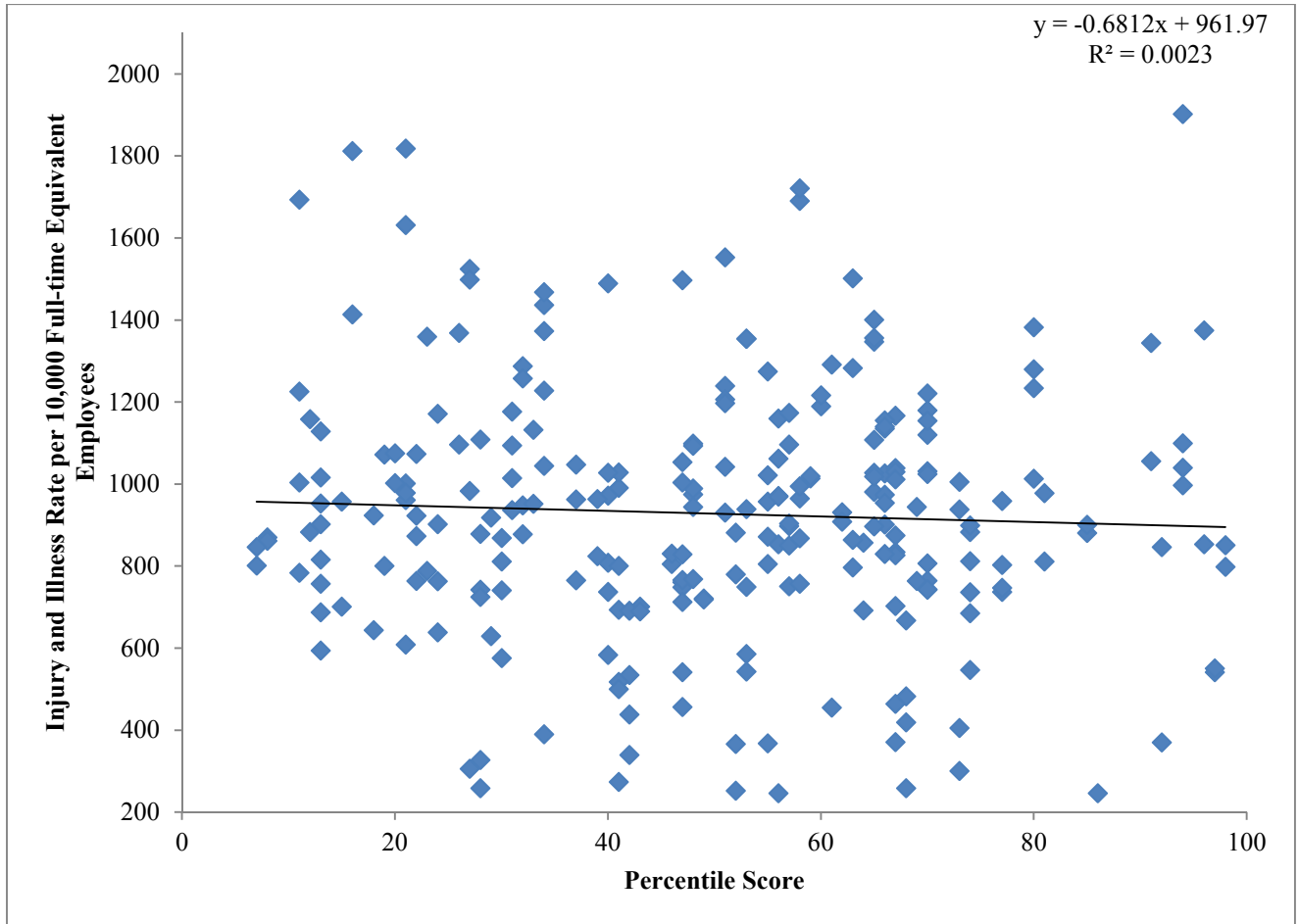
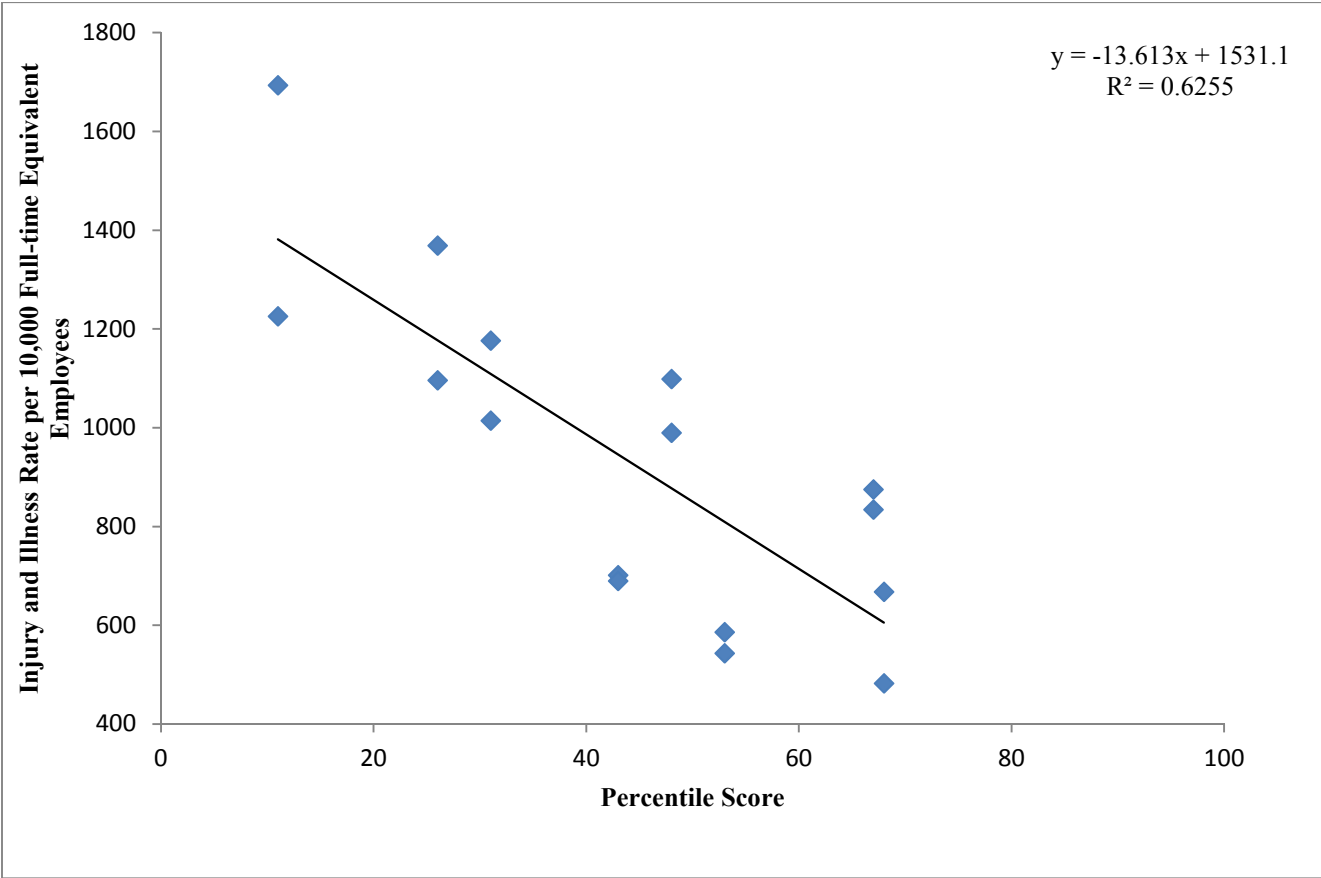


Figure 2. Work-Related Injury and Illness Rates and Overall Percentile Score among VHA Facilities in VISN1 (n=10)



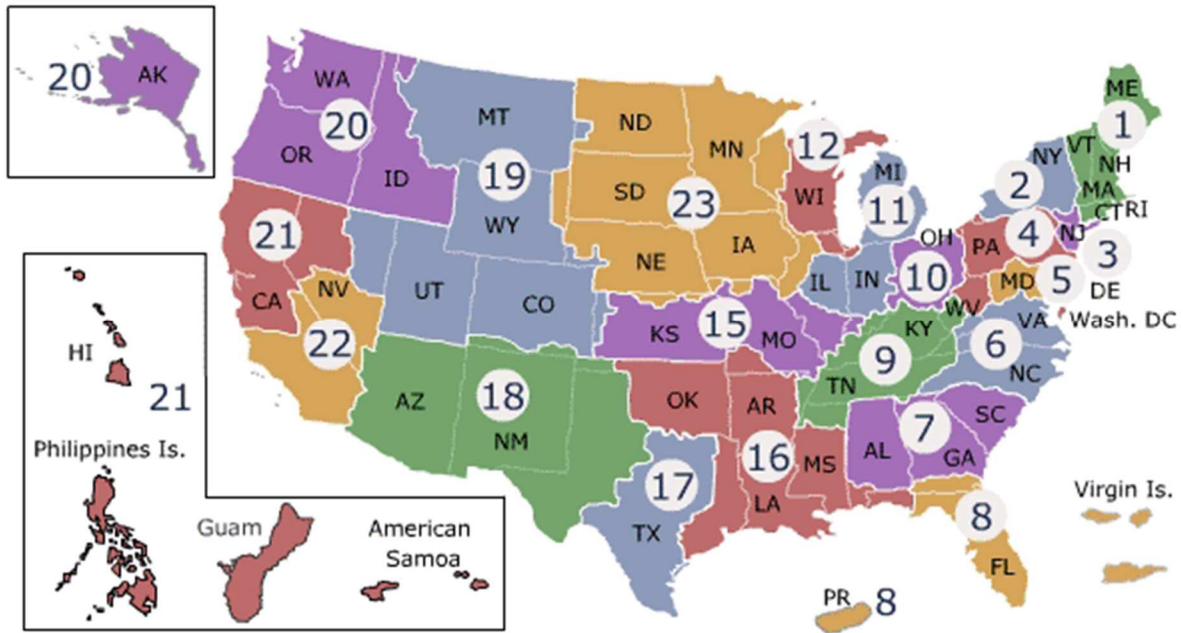
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APPENDICES:

Appendix 1: Map of Veterans Integrated Service Networks (VISNs)



Adapted from U.S. Department of Veterans Affairs. Locations: Veterans Health Administration. Available at <http://www.va.gov/directory/guide/division.asp?dnum=1>.