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Are Incident Rates Reliable and Representative Measures of Safety Program Performance?

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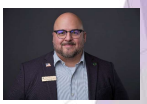

University of Wisconsin Whitewater
College of Business and Economics

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ABET Applied and Natural Science Accreditation Commission

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Agenda

- Why do we need performance measures?
- Where did incidence rates come from?
- Breaking down the incidence rate equation
- Limitations of OSHA recordkeeping and BLS Annual SOII data
- OSHA ITA Data Study
- Looking forward to metrics that drive performance

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What measures do you use?

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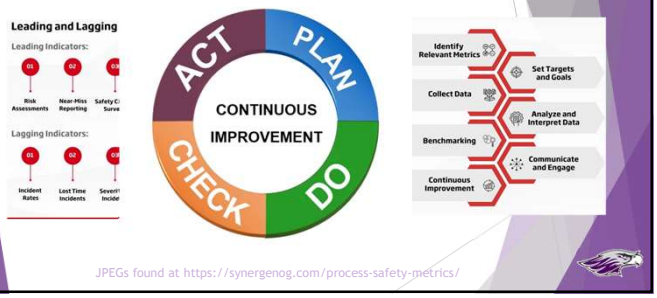
Why do we need safety metrics?



JPEGs found at https://synergenog.com/process-safety-metrics/

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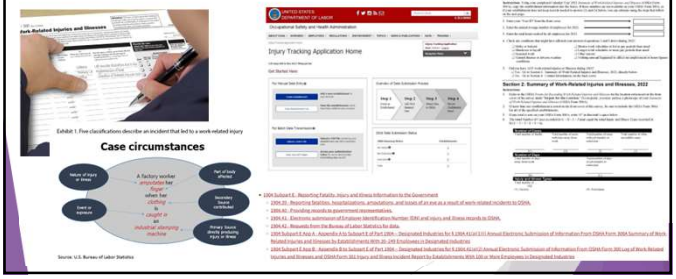
Source for Incidence Rates



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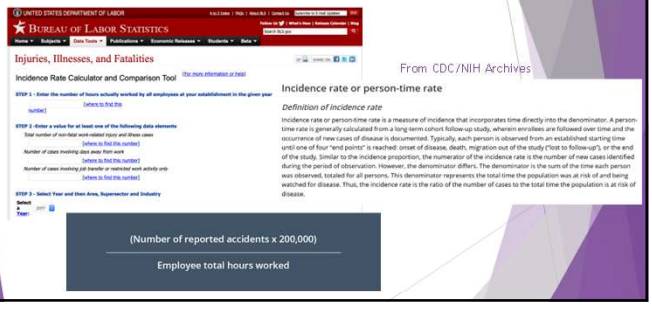
Incidence Rate Equations



From CDC/NIH Archives

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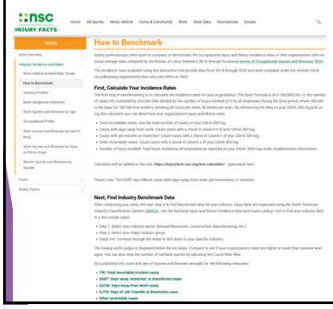
TRIR and DART Applications



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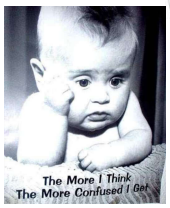
Limitations & Concerns



Garbage In = Garbage Out

Not providing effective insights or understanding to make improvements

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Issues with OSHA's Recordkeeping

- **No attempt to promote Root Cause Analysis** (RCA) with 301 or 300 log
  - Promotes "blaming" or identifying a superficial cause, and under-reporting
  - For analysis purposes, GI -> GO (garbage in, garbage out)
- **Column F** of 300 log contains three important case variables
- **No standardization** to entries, making data analysis difficult
- Overall, RK **rules promote "Under-recording"**
  - Working with HCP, "labels" for nature of injury or restrictions can reduce recordables
- **No continuous improvement**: track mitigation/corrective action, time for completion, responsible parties, or verification of effectiveness

Chapter 13: Progressive Injury and Illness Recordkeeping
Todd William Loushine

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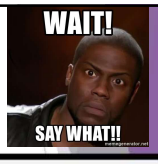
Issues with Incidence Rates



- Calculated as a company-wide metric
  - Hides issues within a company
- The rates can be calculated for any sample with a shared demographic variable
  - E.g. Department, Job title. Cause
- Primarily used as a *lagging indicator*, used for benchmarking/comparison to industry average
  - BLS data is misleading, reported as Industry, not individual company; and distribution is **NOT NORMAL**

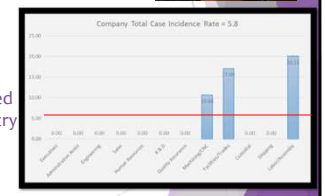


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TABLE 1. Incidence rates[1] of nonfatal occupational injuries and illnesses by industry and case types, 2018

Industry[2]	NAICS code[3]	Total recordable cases (Col. H+I+J)	Cases with days away from work, job restriction, or transfer: Total (Col. H+I)	Cases with days away from work[4] (Col. H)	Cases with days of job transfer or restriction (Col. I)	Other recordable cases (Col. J)
All industries including private, state and local government[3]		3.1	1.7	1.0	0.7	1.4
Private industry[5]		2.8	1.6	0.9	0.7	1.3
Goods-producing[5]		3.3	2.0	1.0	0.9	1.3
Natural resources and mining[5][6]		3.7	2.3	1.2	1.0	1.4
State and local government[5]		4.8	2.3	1.6	0.7	2.5
State government[5]		3.6	1.9	1.4	0.5	1.7
Local government[5]		5.3	2.4	1.6	0.8	2.8

Total Case Incidence Rate = (H+I+J)x200,000/(Hrs Worked)
DART Incidence Rate = (H+I)x200,000/(Hrs Worked)
No Lost Time: Lost Time Ratio = (col J) : (col H+I)
Col J "Other Recordable Cases" is No Lost Time
Col H+I "Days Away + Restr/Trans" is Lost Time

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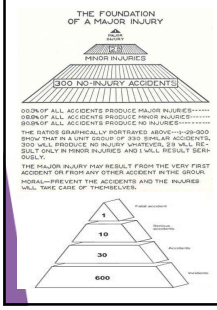
H.W. Heinrich & F.E. Bird Accident Triangle



- Myth that near miss corrections prevent major accidents - That's not what they said!
- Truth is that gaining worker trust to report near misses and engaging with those reports leads to better insights and communication!
- Truth "exposures" need to be investigated and mitigated, or accidents will continue
- Equal ratios per 600 near misses
  - Heinrich: 2 major injures + 58 minor injuries
  - Bird: 1 major injury + 10 minor injuries
- More engage and work-level insight if near miss collected and analyzed!
  - Heinrich: 2 major injuries to 58 minor injuries
  - Bird: 1 major injury to 10 minor injuries

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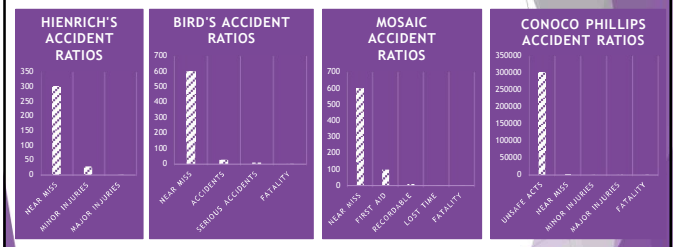
Convert Triangles to Distribution Charts



- A distribution represents the ratio of outcomes, given a consistent or assumed occurrence of exposures. What's the probability of a severe outcome?

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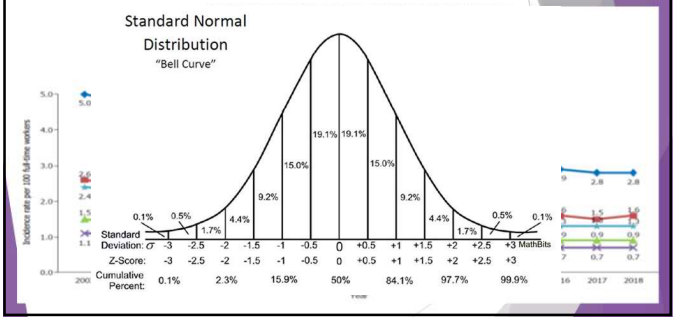
Do you compare your rates to BLS peers?



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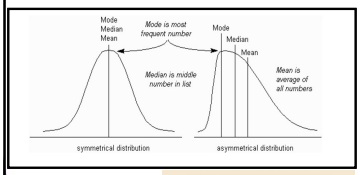
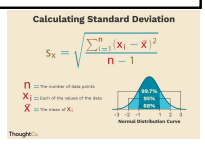
Assumption of Normality





- When we calculate an "average" we naturally assume normality, or mean=mode
- If that assumption is violated, we need to be honest about each descriptive statistic and only perform analyses that are possible given a non-normal distribution
- If we attempt to calculate risk, the outliers will have major influence, and we need to compare the outliers to the more frequent data

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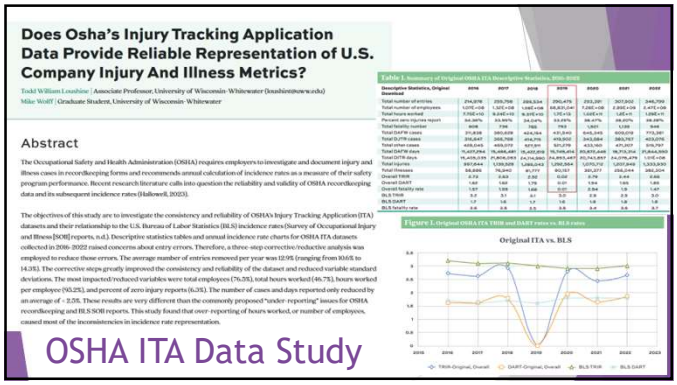
Does Osha's Injury Tracking Application Data Provide Reliable Representation of U.S. Company Injury And Illness Metrics?
Abstract
OSHA ITA Data Study

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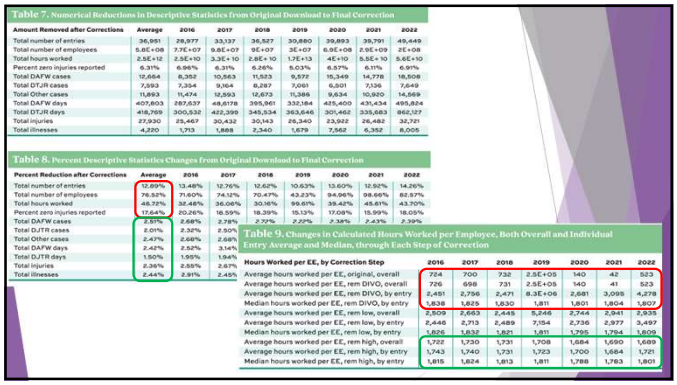
Table 7. Numerical Reductions in Descriptive Statistics from Original Download to Final Correction
Table 8. Percent Descriptive Statistics Changes from Original Download to Final Correction
Table 9. Changes in Calculated Hours Worked per Employee, Both Overall and Individual Entry Average and Median, through Each Step of Correction

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Final Results - No relationship to BLS
Rates different Avg by overall, entry, median
Table 11. TRIR and DART at Each Step of Correction, Overall vs. Individual Entry, and BLS
Final Correction TRIR // DART Overall vs AVG and MED by Entry, vs. BLS

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Group Activity

Efforts and Attributes to Improve

Reduce Vehicle Crash Risk

- What behaviors or conditions lead to vehicle crashes?
- How can you reduce or eliminate those behaviors and conditions that lead to vehicle crashes?

Improve Driver Safety & Enjoyment

- What behaviors or conditions lead to safer driving experience?
- What behaviors or conditions lead to more enjoyable driving experience?
- How can you promote/acknowledge behaviors/conditions that lead to safety and more enjoyable driving experience?

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Group Activity

Efforts and Attributes to Improve

Lose Weight

- Eat less or Diet foods
- Exercise more
- Track weight
- Track caloric intake

Improve Healthy Behaviors

- Assess current health status for medical determinations
- Identify support system for lifestyle changes
- Create realistic (SMART) goals
- Make incremental changes to meal-planning/prep
- Engage in activities you enjoy that get you moving (get heart rate up)

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Looking Forward – Safety Metrics

- Customized and specific to the company's current safety program and threats to effectiveness
- Compare data only to self and track change performance
- Measure positive observations and efforts to improve behaviors and conditions
- Acknowledge success, and learn from failures
- Safety is an attribute of work

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