Measuring Up

"*Meaningful*" Health Metrics

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“If you don't know where you are going, any road will get you there.” Lewis Carroll

“Meaningful” Metrics

Why collect data

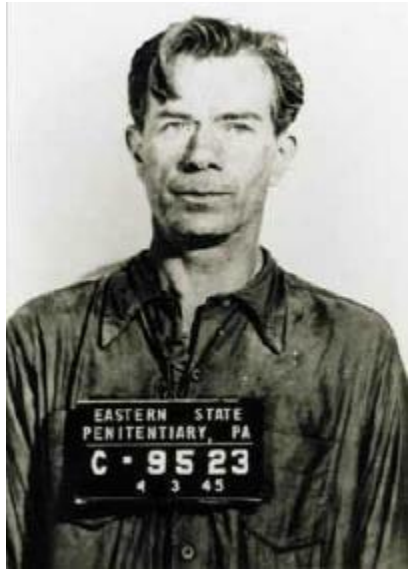
- ❖To assist in decision-making
  - Assess potential impacts
  - Identify trends
  - Choose between options

Why not (potentially)

- ❖When path forward has already been decided
- ❖When there is no potential impact
- ❖When costs for measurement exceed control expense

Measurable, Transparent and Standardized

Why Use Metrics?



Someone once asked Slick Willie Sutton, the bank robber, why he robbed banks. The question might have uncovered a tale of injustice and lifelong revenge. Maybe a banker foreclosed on the old homestead, maybe a banker's daughter spurned Sutton for another.

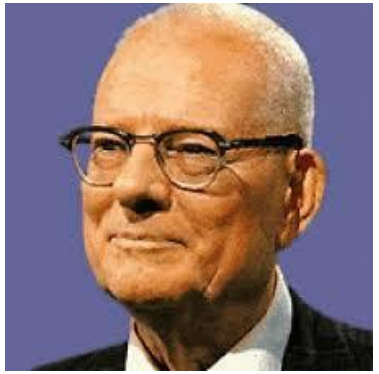
Sutton looked a little surprised, as if he had been asked "Why does a smoker light a cigarette?"

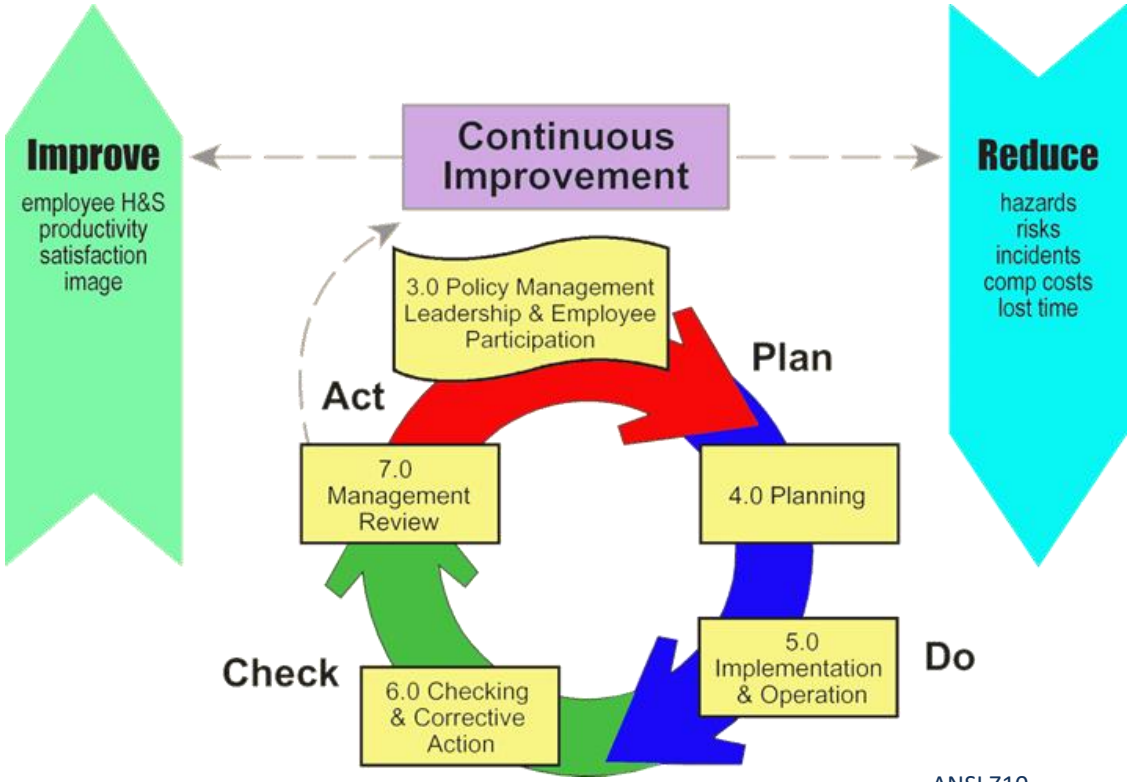
"I rob banks because that's where the money is," he said

The Saturday Evening Post in January 1951

Because That's Where the Money (Leadership Attention) Is

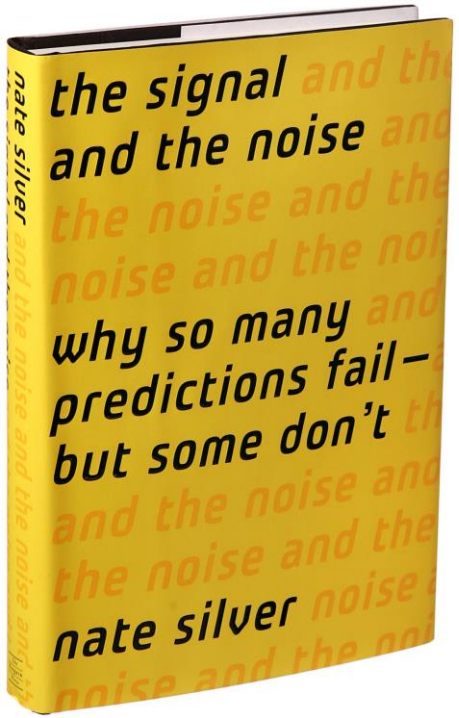
“In God we trust; all others must bring data.” W. Edwards Deming (*probably*)





ANSI Z10

Identifying Causation

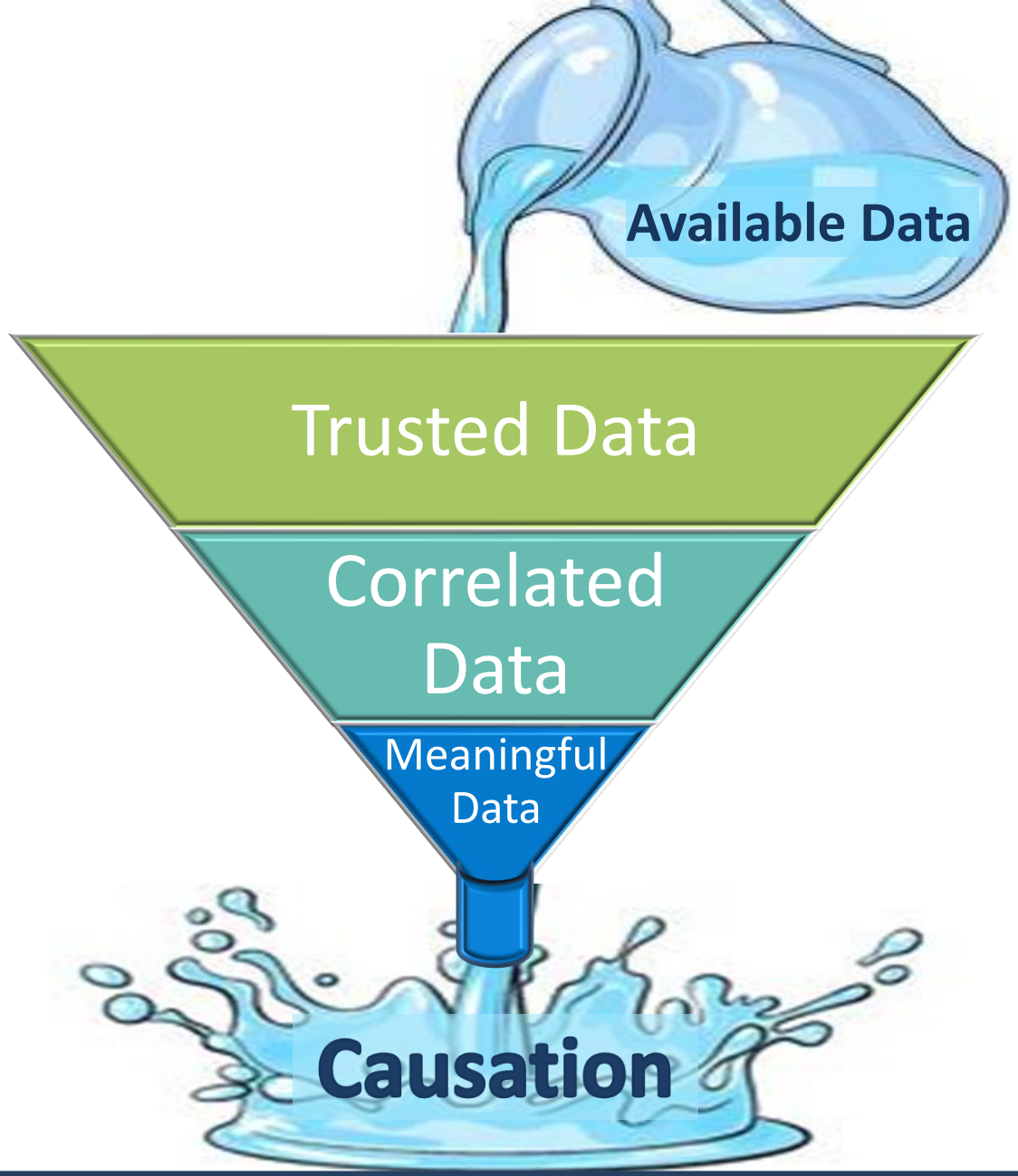


Just because two variables have a statistical relationship with each other does not mean that one is responsible for the other. For instance, ice cream sales and forest fires are correlated because both occur more often in the summer heat. But there is no causation; you don't light a patch of the Montana brush on fire when you buy a pint of Haagen-Dazs."

— Nate Silver, The Signal and the Noise: Why So Many Predictions Fail - But Some Don't

Correlation Does Not Imply Causation

Data Glut



Early Epidemiology

- Hippocrates ~460 BC - 1st record of the relationship of disease to environmental impacts ("Humors" - air, fire, water and earth)
- Girolamo Fracastoro 1543 – Disease caused by very small, living particles
- Anton van Leeuwenhoek 1675 - visual evidence of living particles consistent with a germ theory of disease
- James Lind 1754- Identified preventive measures for scurvy
- John Snow 1854- Traced source of London cholera epidemic
- Pasteur and Koch late 1800s- Debunked "spontaneous generation"
- Doll & Hill 1954- Linked tobacco use to lung cancer

Early Industrial Hygiene

- Ulrich Ellenbog 1473- Diseases of gold miners
- Girolamo Fracastoro 1543 – Disease caused by very small, living particles
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The Birth of Health Metrics

While most early efforts were based on observations which could be considered “metrics” the most significant formalized data collection and analysis effort was described in Ramazzini’s work

“De Morbis Artificum Diatriba (Diseases of Workers)”

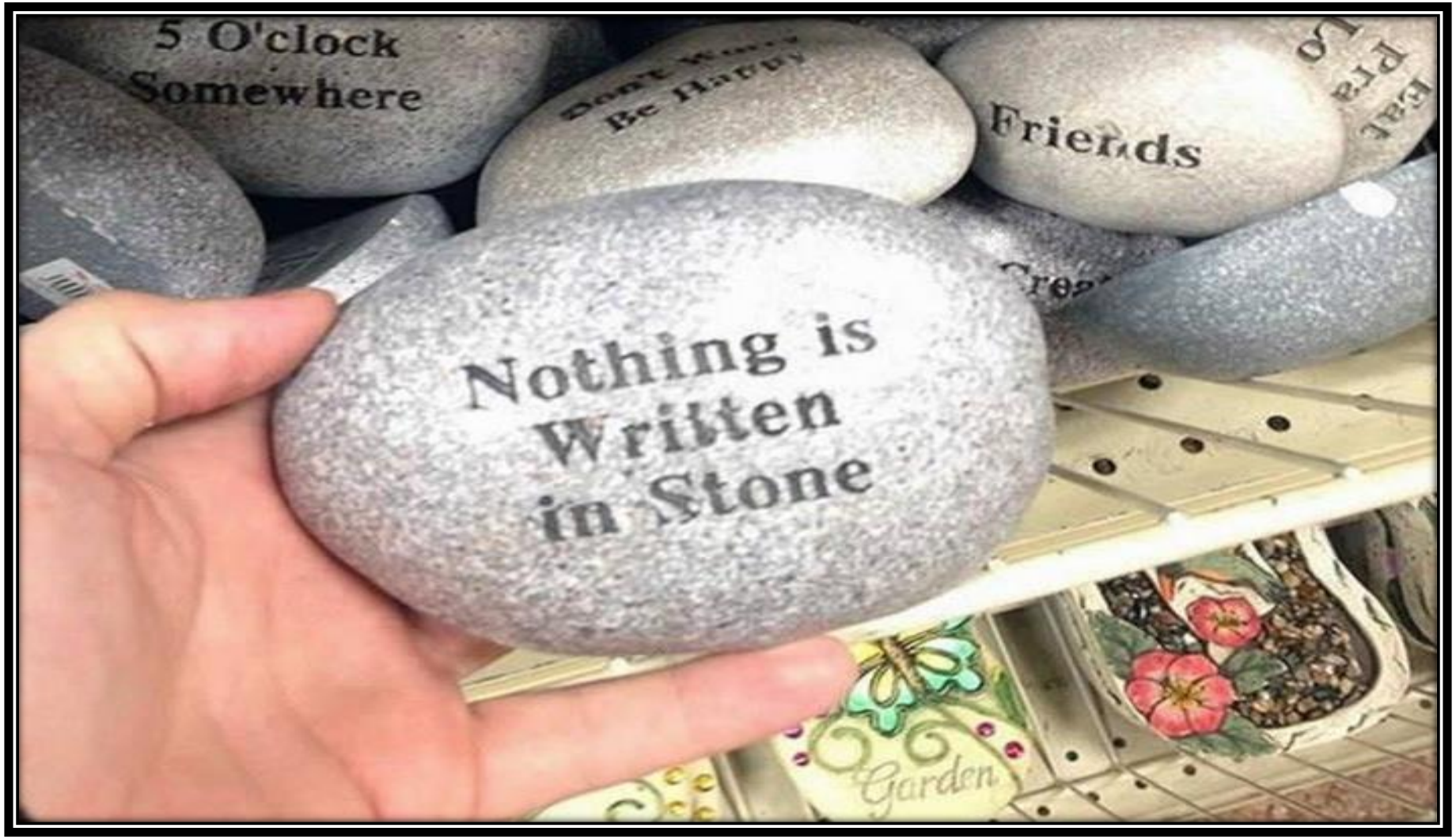
“When you come to a sick person, says Hippocrates, it behooves you to ask what uneasiness he is under, what was the cause of it, how many days he has been ill, how his belly stands, and what food he eats: ***To which I'd presume to add one interrogation more; namely, what Trade he is of.”***

Translation from Latin 1705

Value Based Decision Making

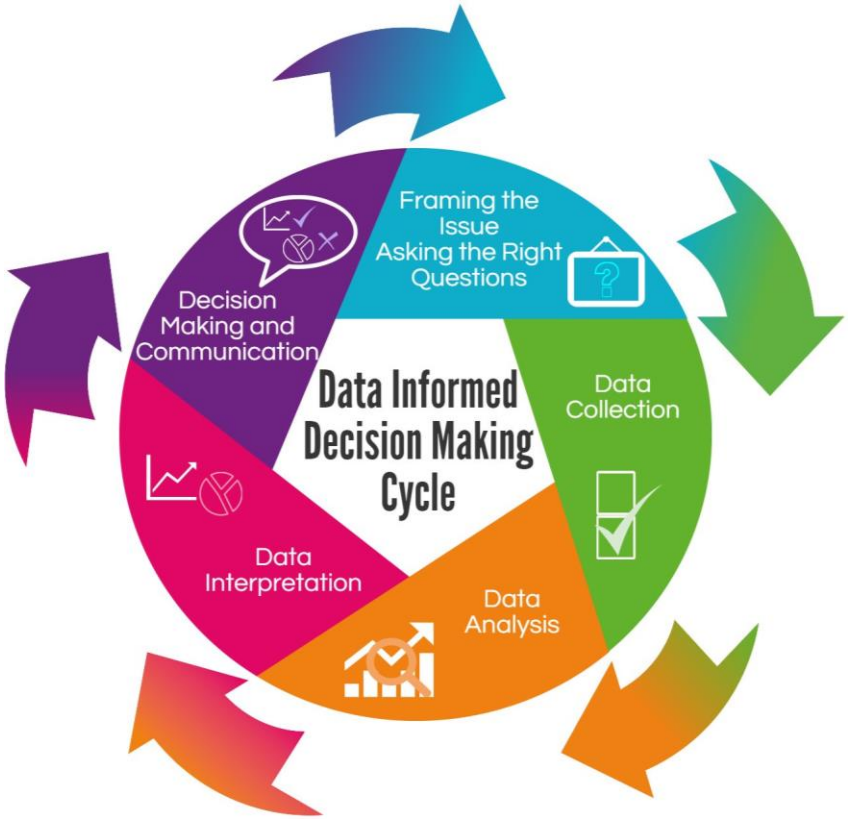
1. Focus on measuring elements with greatest impact
2. Know your goal
   - Intellectual curiosity vs business/worker value
3. Is the answer “real”?
4. Can it be used to;
   - Identify concerns
   - Check progress
   - Evaluate program effectiveness
   - Facilitate communication

Each Organization is Unique



Data-Informed Decision-Making

- Most common in educational setting
- Why not just “Data Based”?
  - ❖ Not limited to use of quantitative data
    - Experience, practical issues
- Programmatic direction
  - ❖ Available resources
  - ❖ Fine tune at local level
- Best used with low “action” level
  - ❖ Well below exposure concerns



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Does this Approach Facilitate Decision-making?

Robust Process - ESHMS

- Initial and Ongoing Reviews
- Allocation of Resources
- Environmental Aspects
- Objectives and Targets
- Implementation Plans
- ESH Risks
- Programs
- Legal

- Design Review
- Communication
- Operational Control
- Hierarchy of Controls
- Management of Change
- Procurement, Contractors
- Documentation and Control
- ESHMS Operational Elements
- Emergency Preparedness and Response
- Education, Training, Awareness, and Competence

- Assessment
- Monitoring
- Measurement
- Internal Audits
- Incident Investigation
- Evaluation of Compliance
- Corrective and Preventative Actions
- Feedback to the Planning Process

- Management Review Process
- Continuous Improvement
- Consequences
- Outcomes
- Follow-Up

Leading Health Metrics

Measurable, Meaningful, Transparent and Standardized

CSHS

Center for Safety & Health Sustainability

- The Center was launched in June 2011 as a 501(c)3 nonprofit organization (AIHA, ASSP, CSSE, IOSH)
- CSHS provides over 100,000 occupational safety and health professionals in over 70 countries with a stronger voice in shaping sustainability policies.
- Vision Statement - For all organizations to consider the safety, health and well-being of workers, customers and the community as part of their sustainable business practice.

CSHS Goals

- To provide a strong voice and comprehensive leadership for safety and health in shaping sustainability policies.
- To educate the business community on the importance of safety and health as part of good corporate governance and corporate social responsibility/sustainability.
- To provide new insights into the measurement, management, and impact of safety and health sustainability.
- To be a recognized thought leader for sustainability and corporate social responsibility.

Our View

- Health and safety performance should be publicly reported.
- Organizations have a responsibility to publicly and transparently report this information.
- Leading frameworks and standards bodies, including the Center, have a responsibility to ensure this can be done consistently and in a fashion that allows for comparison among organizations.

Health Metrics

- Traditional reported metrics are most often retrospective/ lagging indicators that measure the consequences of unintended events
- Several attempts have been made to develop better indicators to help anticipate and minimize/prevent negative OHS consequences
- Convened a broad working group comprised of interested parties representing professional societies (IH, Safety, Medical etc.), industry, and government.
- Developing a recommended set of leading health indicators for publication

Team

Center for Safety & Health Sustainability

Some Team Members Affiliations

- CDC
- NIOSH
- Colorado Department of Public Health
- Northern Alberta Institute of Technology
- Keene State College
- IOSH
- American Chemistry Council
- Honeywell
- 3M
- SAIF Corporation
- General Motors
- Western Digital Corporation
- Westat
- Chevron
- CARDNO
- Lockheed
- L'Oréal
- Tetratech
- DuPont
- Suncor Energy

Project Lead & AIHA Staff

- Alan Leibowitz (CSHS) – EHS Systems Solutions
- Stacy Calhoun (AIHA) – Project Manager
- Larry Sloan (AIHA) - CEO

Strategy Outline

Center for Safety & Health Sustainability

Our Mission: Development of new leading health metrics that are used by all OHS professionals and the broader community worldwide

Our Vision: Consistent health metrics to drive the elimination of workplace illnesses globally - improving workplace health and wellness

Strategic Framework Goals		
Develop Leading OHS Metrics	**Foster Community**	**Drive Awareness & Global Acceptance**
Strategic Objectives		
1. Review previously developed / existing materials developed by AIHA, multi-national companies and other stakeholder groups	1. Leverage AIHA Catalyst online community platform to develop and test feasibility of core set of metrics	1. Seek outside assistance to develop harmonized messaging that speaks to the core issue
2. Agree on a draft set of leading health metrics based on agreed upon criteria	2. Work with non-CSHS Intersociety Forum members (e.g. NAEM, NSC) and other experts (e. g. OSHA, NIOSH) to obtain input and rally support	2. Secure few key global partners (e.g. non-profits, trade publications) to help generate awareness
3. Beta test metrics with selected stakeholder groups	3. Liaise with manufacturing trade associations (e.g. NAM) whose members should have vested interest in project	3. Develop target marketing campaigns to test and measure awareness/acceptance rates over time
4. Distribute guidance material into the marketplace.	4. Encourage incorporation into other existing standards (e. g. GRI)	4. Deliver presentations at various meetings of interested organizations.
Metrics of Success		
1. See the creation of new set of leading health metrics	1. Attract interest and engagement on Catalyst by tracking upward trending discussion thread activity	1. Create compelling messaging that resonates favorably with multi-national companies
2. Affirm “viability” and “usability” of metrics by leading multi-national companies	2. Secure allies in manufacturing, design/build, and other key designated industry sectors allied with our mission	2. Measure effectiveness of marketing campaigns based on established “awareness” and “favorability” factors
		3. See adoption of new metrics by increasing number of multi-national companies year-over-year

Editing Outline

Section	Content	Responsible team/author
Cover page - **Title, Sponsors**	-Best Practice Guide for Leading Health Metrics in Occupational Health and Safety Programs -AIHA, CSHS	Editing
Copyright page	-Copyright - date 2020? -Citation caveats (from CSHS, AIHA), -Standard use disclaimers	Editing
Table of Contents	TBD	Editing
Acknowledgements	-List task force members, contributors -Intended audience, use = broad IH community (IH, Medical, engineering, HR…), integrator, practitioner	Editing
Introduction	Who is CSHS? AIHA? Why this guide on LHM? Value to reader/organization -To advance forward thinking -Link metrics to work Scope: -What is/ is not included? -Safety/Injury Metrics -Health Program metrics -Community health metrics Approach – survey/literature review, nothing new – we describe features of LHMs presented in the literature	Alan Outreach/Data collection
Organization of Guide	How to use	Editing
Elements of a Leading Health Metric	-What is health (i.e., a health indicator)? -Elements included: Performance measure, Measurement method, , Health outcome, Time element, Improvement goal/target (optional), etc… -Calculations - Denominators	Editing/ALL
Types/categories/dimensions health metrics	Summary of different categorizations of LHMs, when and why appropriate	Data review
Gaps identified	Missing types/categories of LHMs, inadequate measurement description, etc., TWH	
Recommended LHMs (by category)	Listing of recommended LHMs (with source), why/how selected	Data Analysis
References	Citations in text	Editing
Definitions	TBD	Editing
Appendices	Table of literature found by search with some, useful information (i.e., Catalog) TBD (Examples vs case studies) Curate metrics Anticipation/recognition phases	Data review/analysis Paul W: Stats, CIs

Draft Roadmap

Roadmap Elements	Summary Roadmap					
	Current Position	2019 Q2	2019 Q3	2019 Q4	2020Q1	Vision / Future State

• Data Collection
• Stakeholder Outreach
  • Corporate
  • Regulatory
  • Association
  • Academic
	• Early stages
	• Data not organized
	• Know what we know
		Complete Collection				• All requests and follow-up complete
						• Representative data from all sectors

		Organize Data				

• Data Review
  • Standard process
  • Learning
  • Talent Development
	• Leads established
	• Work not yet initiated
		Develop Template(s)				• Examples identified, analyzed and organized
						• Opportunities identified

		Review previously developed / existing materials Data				
		Review innovative ideas				

• Editing
  • Model
  • Learning
  • Talent Development
	• Lead established
	• Work not yet initiated
			Develop outline			• Metrics selected
						• Final publication produced

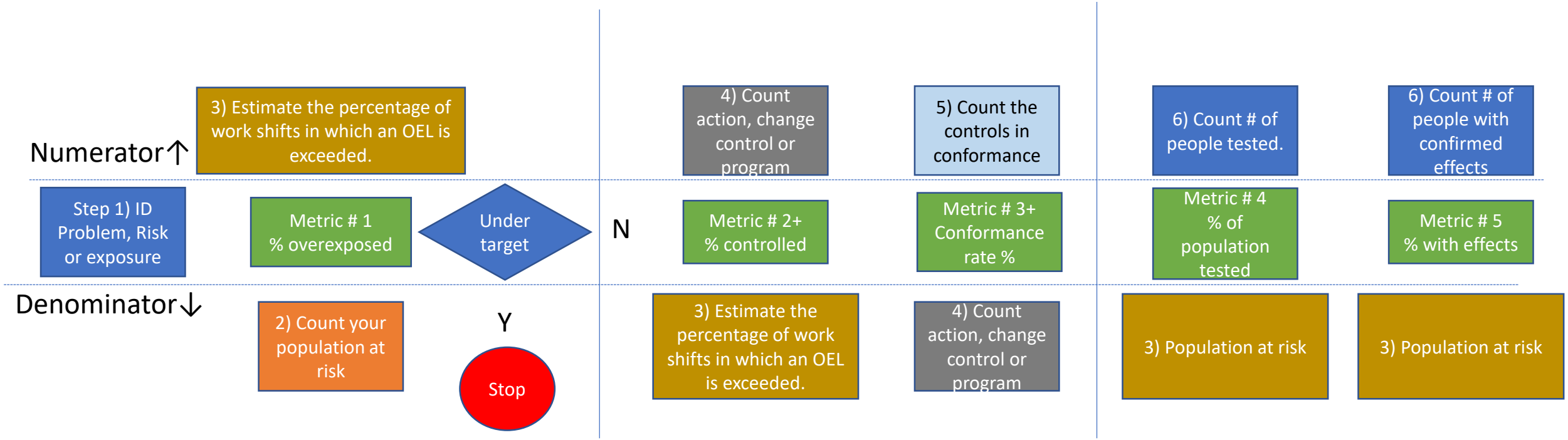
				Draft Product		
					Beta test	
• Publish and Promote • Customer Focus	Work not yet initiated				*TBD*	• Quality product widely communicated

Develop, Publish and Communicate - Measurable, Meaningful, Transparent and Standardized Leading Health Metrics

Using Metrics (concepts)

1. ID problem, or exposure
2. Calculate total population at risk/population total, or population overexposed/population at risk.
3. Set a target.
4. If less than target, and data or target not expected to change, stop. If not, consider additional metrics to refine understanding.
5. Often the numerator from one step becomes the denominator for the next.
6. Overall goal is assessment of risk for all individuals

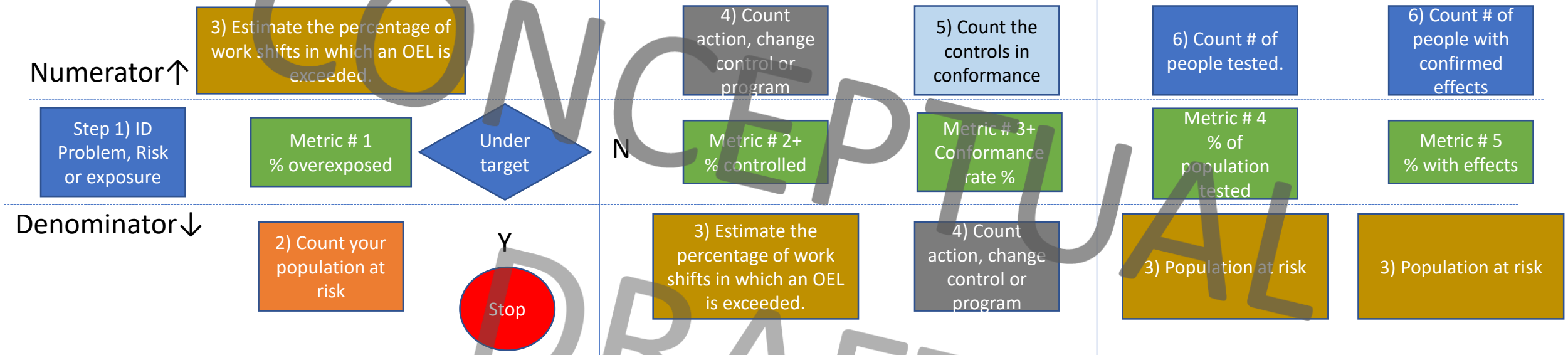
Methodology to Develop a Set of Metrics



CONCEPTUAL DRAFT

Methodology to Develop a Set of Metrics

Problem, Exposure or Risk	Actions, systems, programs, controls, etc.	Resulting Effect
ID your problem, or exposure, and count the total population at risk/population total, or population overexposed/population at risk. This is your starting metric. Yields a %. Set a target. If you are under target, and you don't expect data or target to change, stop. If not, consider additional metrics.	For EACH action, change, control, set Metric # 2 and 3. if you are using a program, there may be many steps, you may need multiple metric # 2 and 3. Notice the previous numerator becomes the denominator. This gives you more predictors that the resulting health effects can be minimized by the efforts here. Each of these metrics should be compared to a target, and themselves over time to continually improve.	The health effects may be quantitative or qualitative. Often, exposures can be tested with biomarkers. Sometimes you will compare pre and post exposure biomarkers as well. If health effects are evident, and the previous set of metrics (2 and 3) did not predict, recalibrate your actions, programs, controls, etc. There may be other effects of the exposure besides health that you want to measure. Typically, you want zero resulting effects.



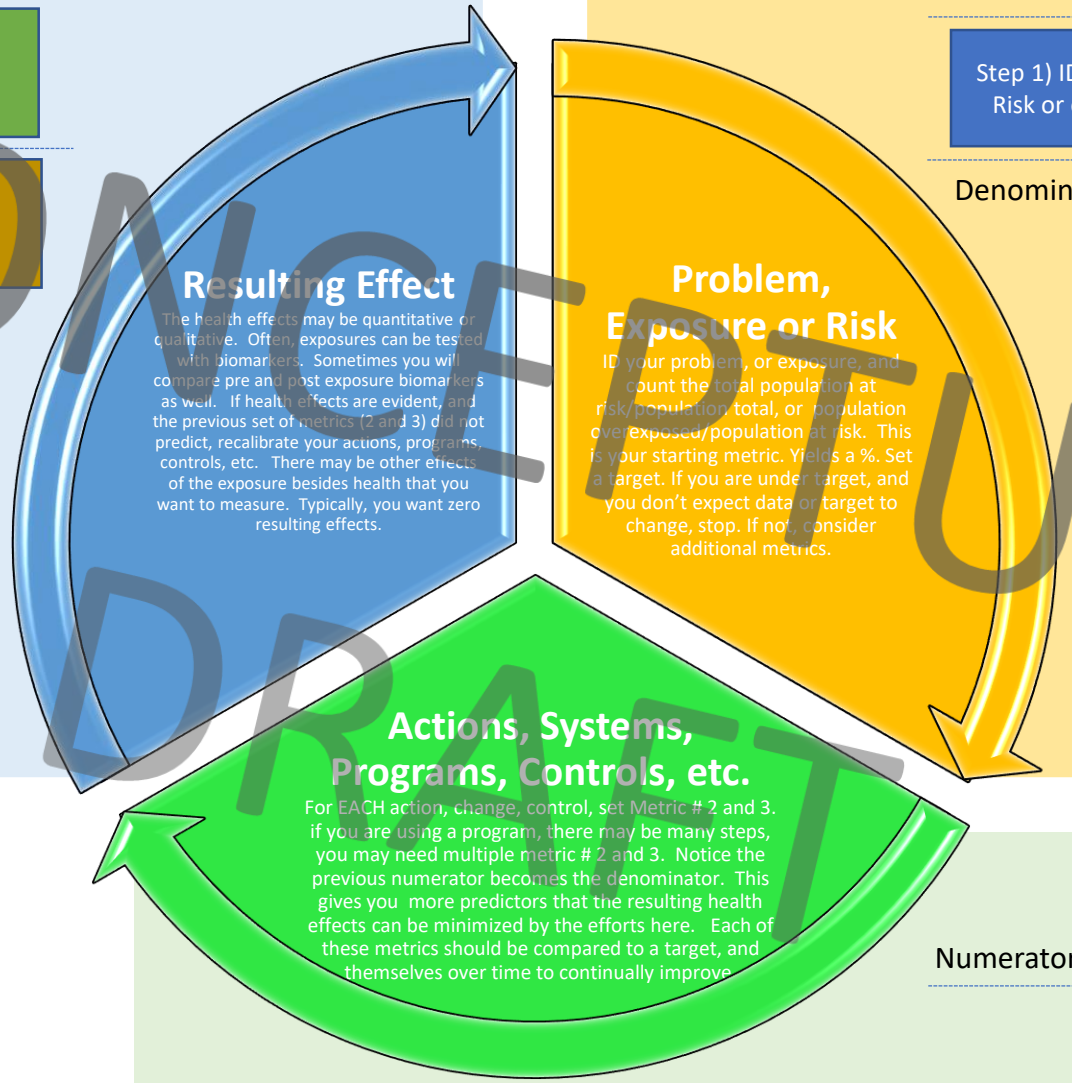
Steps for computing Metric # 1 % overexposed:
1) ID Problem, Risk or exposure
2) Count your population at risk
3) Count your population overexposed

Count your population at risk: This is a listing of unique identifiers for the members of an exposure group. Information management theory says this should come from the business process that places the greatest importance

There are an entire universe of possible metrics in this area. Some metrics may be generated by program audits or assessments, closure rates for action plans, the % of controls that are engineering, vs admin/PPE.

Biomarkers or health effects are precursors to illness and disease. Typically, illness or disease will take many years to become apparent. Illness and Disease are the Lagging Metrics.

Methodology to Develop a Set of Metrics



Numerator↑
- 6) Count # of people tested.
- 6) Count # of people with confirmed effects

Metric # 4 % of population tested

Metric # 5 % with effects

Denominator↓
- 3) Population at risk
- 3) Population at risk

Biomarkers or health effects are precursors to illness and disease. Typically, illness or disease will take many years to become apparent. Illness and Disease are the Lagging Metrics.

Numerator↑
- 3) Estimate the percentage of work shifts in which an OEL is exceeded.

Step 1) ID Problem, Risk or exposure

Metric # 1 % overexposed

Under target? N / Y → Stop

Denominator↓
- 2) Count your population at risk

Steps for computing Metric # 1 % overexposed:
1) ID Problem, Risk or exposure
2) Count your population at risk
3) Count your population overexposed

Count your population at risk: This is a listing of unique identifiers for the members of an exposure group. Information management theory says this should come from the business process that places the greatest importance on the data. Line managers identify employees assigned to jobs and tasks requiring participation in a risk management programs. Personnel records contain meta data such as unique identifiers, age, gender, organization codes, duty stations and job titles. Industrial hygiene records contain exposure monitoring results from members of the group. Medical records contain information on the placement evaluations and medical care provided to members of the group. Training records contain information on the qualifications of members of the group. Multi-employer work sites add complexity to accessing the needed information that should be resolved before work begins. Policies on when to include vendors and other visiting workers should also be established.

There are an entire universe of possible metrics in this area. Some metrics may be generated by program audits or assessments, closure rates for action plans, the % of controls that are engineering, vs admin/PPE.

Numerator↑
- 4) Count action, change control or program
- 5) Count the controls in conformance

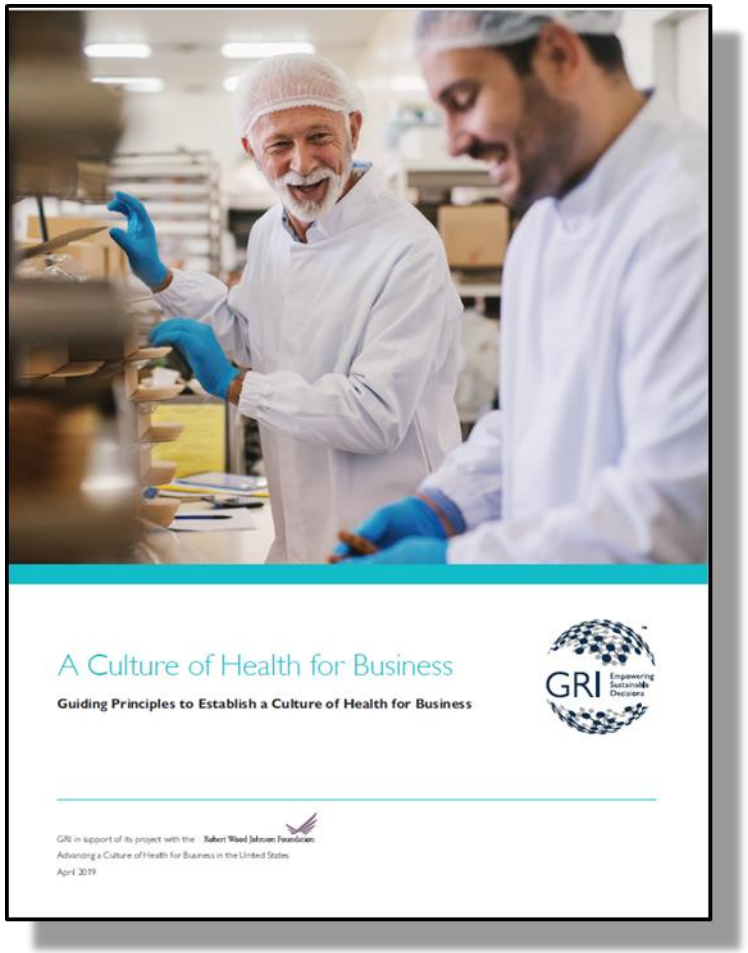
Metric # 2+ % controlled

Metric # 3+ Conformance rate %

Denominator↓
- 3) Estimate the percentage of work shifts in which an OEL is exceeded.
- 4) Count action, change control or program

Global Reporting Initiative (GRI)

- Robert Woods Johnson Foundation with GRI
  - ❖"A Culture of Health for Business: Guiding Principles to Establish a Culture of Health for Business"
  - ❖Released in April 2019
  - ❖GRI Metrics, literature review, corporate reporting, psychosocial predictors
  - ❖Initial gaps observed – IH, Total Worker Health



A Culture of Health for Business

- Part I: A Culture of Health for Business
  A. Introduction
  B. Health
  C. Business & Health
  D. How the Private Sector Can Further Contribute to a Culture of Health and Improve Business Performance
  E. How Should the Marketplace Think About A Culture of Health?
- Part II: Project Research
  A. Literature Review: Culture of Health Business Practices
  B. Health Measures in Major Environmental, Social and Governance Frameworks
  C. Corporate Reporting of COH Business Practices

Campbell Institute National Safety Council

- "Leading Indicators for Health & Wellbeing" and implementation guide
- Released in 9/9/19
- Medical aspects, scope, outcomes, participation, program vitality

Leading Indicators for Health & Wellbeing

1. Education/Awareness - Metrics intended to measure the awareness of employees when it comes to the organizational H&W offerings

2. Reach - Measures of the scope of H&W activities in terms of geographic location and/or populations reached

3. Participation - Metrics measuring the extent of employee participation in H&W programs/activities

4. Satisfaction - Measures of employee satisfaction with H&W programs/activities

5. Organizational Health - Measures to assess the “health” or functioning of the H&W program

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