AUSTRALIAN INSTITUTE OF OCCUPATIONAL HYGIENISTS

What does good health look like? Raising the Standard of Occupational Health Performance Indicators

AIOH General Councilor
Dr Carmen Naylor

AGENDA

- AIOH Working Group
- Statement of the Problem
- Lagging and Leading Indicators
- Example Occupational Health Indicators
- Breakout room

STRATEGIC PROJECTS INIATIVES – 5 in 5 years

Make visible what good worker health looks like

Maintain focus on occupational respiratory diseases

Improve the reach and coverage of occupational hygiene

Look for ways to reform grow and modernise AIOH

Position the AIOH as a Centre of Excellence

Strategic Plan Summary (2023-2028)

AUSTRALIAN INSTITUTE OF OCCUPATIONAL HYGIENISTS ® AIOH

40 YEAR ANNIVERSARY

CELEBRATING OVER 40 YEARS OF PROTECTING AUSTRALIAN WORKER'S HEALTH

AIOH Strategic Plan 2023-2028

Mission	**A Healthy Working Environment for All**				
Vision	Our mission is to promote worker health and wellbeing. We strive to be the provider of evidence-based occupational hygiene knowledge and to be recognised as the peak scientific body whose members are competent, highly regarded and effective in the protection of worker health and our communities.				
Strategic Themes	**Raising The Standards**	**Advocacy & Influence**	**Enhanced Our Profile**	**Professionalism**	**Operational Excellence**
Objectives	• Make visible what good worker health looks like through metrics and evidence • Take positions that prioritise the protection of workers to As Low as Reasonably Practicable • Shift the focus from Hearing Conservation to Noise Control • Maintain the focus on prevention of Occupational Respiratory Diseases • Embrace the concept of Total Worker Health and work as part of a healthy society	• Influence through evidence-based advocacy • Provide national leadership on the future of workplace health & safety • Maintain high quality and frequency of AIOH media and communications	• Establish occupational hygienists as the scientists of workplace exposure • Improve the reach of occupational hygiene, providing the competencies and coverage that Australia needs if workplaces are to be healthy environments for all	• Position the AIOH as the go-to source for OH body of knowledge and Centre of Excellence for occupational hygiene practice • Evolve our approach to Professional Development & Education to meet future needs • Support hygienists to make exposure assessment decisions based on the best available science including new and emerging areas of health risk	• Enhance the Professional Member experience of AIOH • Secure our future through business continuity and inclusive succession planning • Pursue a financial risk management strategy that balances opportunities for growth with protection of member funds • Look for ways to reform, grow and modernise the AIOH organisation and structures • Provide meaningful staff and volunteer opportunities and support them to be most effective

MAKE VISIBLE WHAT GOOD WORKER HEALTH LOOKS LIKE THROUGH METRICS AND EVIDENCE

Endorsed Stage 1-2

Project Lead:	Carmen Naylor	**Years**	2023 – 2025
Project Sponsor	AIOH Council	**Strategic Theme(s)**	Raising the Standards Advocacy & Influence

Project approach and resourcing:

- 3 stage project to research, collect and publish deidentified information about occupational illness and worker health
- Identify leading and lagging indicators beyond workplace compensation statistics
- Investigate using crowd sourced exposure data and latest data science technology

Raising The Standards

- Make visible what good worker health looks like through metrics and evidence

Advocacy & Influence

- Influence through evidence-based advocacy
- Provide national leadership on the future of workplace health & safety

AIOH AUSTRALIAN INSTITUTE OF OCCUPATIONAL HYGIENISTS

WORKING GROUP

Project Lead:	Carmen Naylor	**Years**	2023 – 2025
Project Sponsor	Nicola Peel	**Strategic Theme(s)**	Raising the Standards Advocacy & Influence
Working Group	• Gary Lux - ANSTO • Maria Prior –ANSTO • Jane Whitelaw – University of Wollongong • Dr Vinod Gopaldasani - University of Wollongong • Soraya Canvin – ANSTO • Fiona Macfarlane – ANSTO • Ajay Thomas – ANSTO • Shilpa Panyam – NSW Health • Adelle Liebenberg – Edith Cowen University • Jodie Dawson – Orica • Mark Rawlings – Safe Work NSW • Vanessa Sharp – Qantas • Julie Moore – Rio Tinto • Luke Dunk – Fire Rescue Victoria		

STATEMENT OF PROBLEM

- Low number of Occupational Health Indicators & KPI’s
- Overly focused on injuries
- Reporting on lagging indicators
- Cause difficult to determine

Work Related Fatalities – Is this a Blind Spot?

Source: Adapted from AIOH Foundation Paper

National Occupational Regulatory Disease (NORD) Registry

Vision:

"A National Occupational Respiratory Disease Registry will support the elimination of preventable occupational respiratory diseases by facilitating earlier detection, intervention and prevention activities."

Occupational Illness in Australia

Australian Mesothelioma Registry (AMR)

Main findings

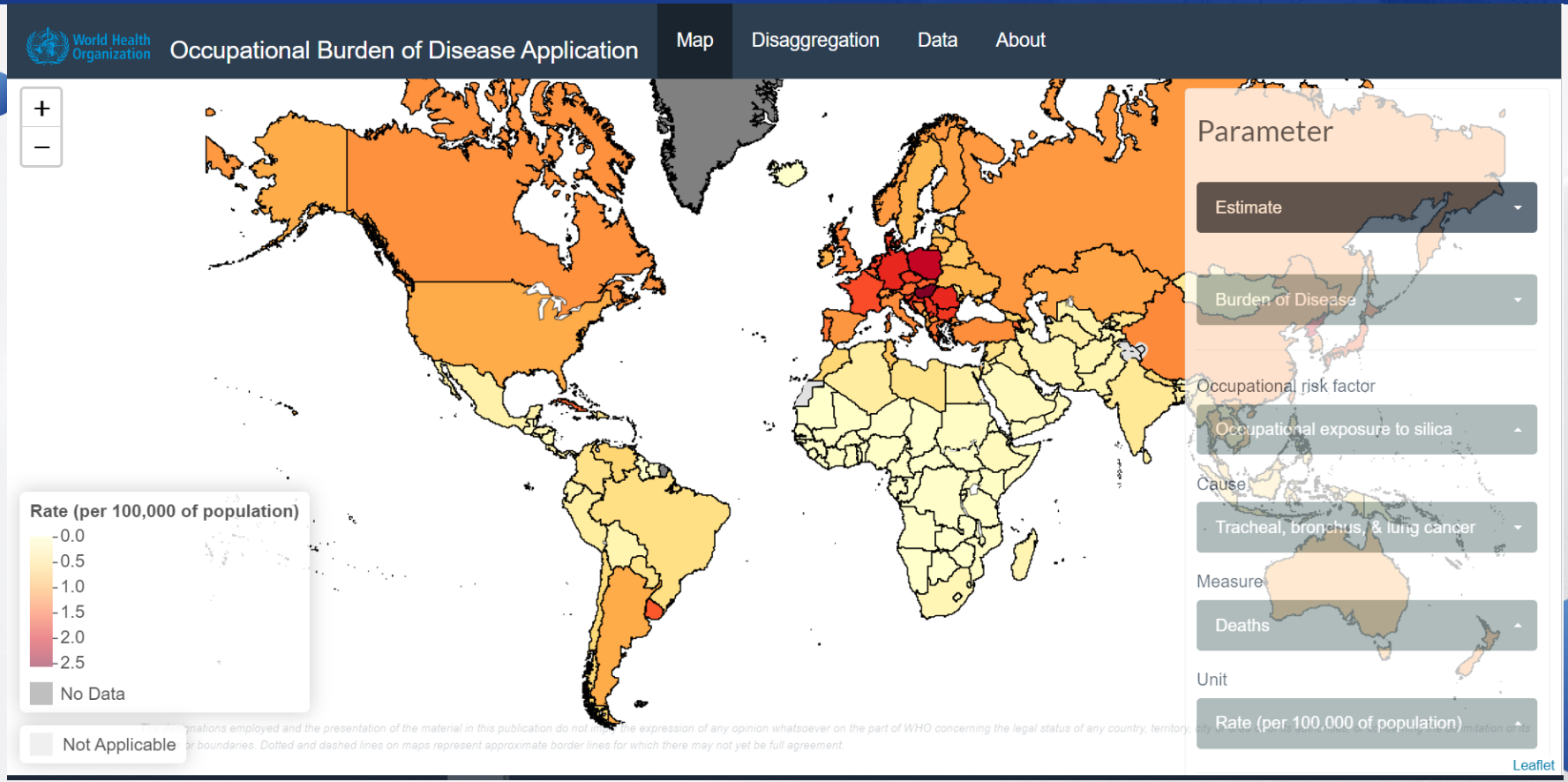
722 cases of mesothelioma diagnosed in 2021 had been reported to the AMR as at 1 November 2022 – the **median age at diagnosis was 77**.

Between 1989–1993 and 2014–2018, the age-adjusted **relative survival of people with mesothelioma has increased**, most notably 1-year relative survival.

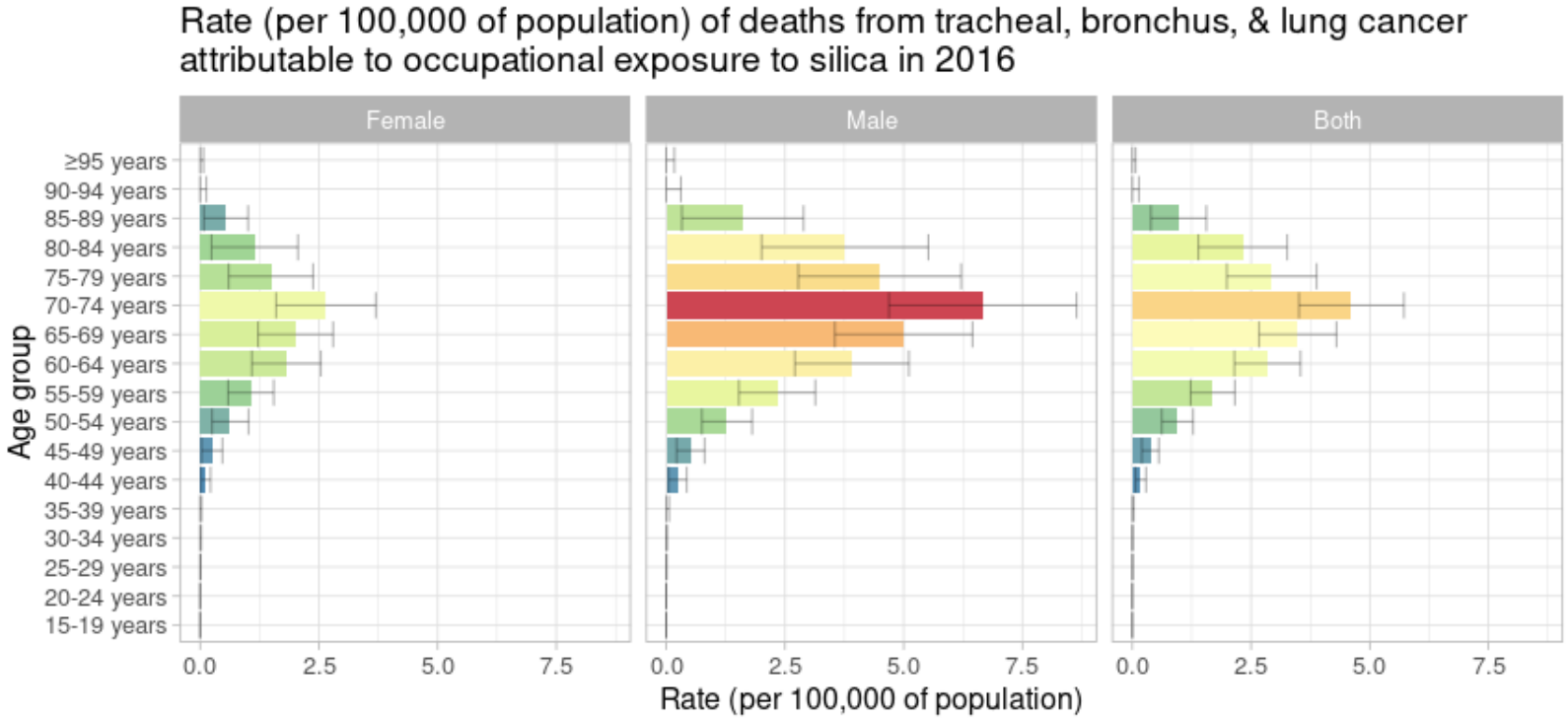
In 2020, there were **701 people** who died from mesothelioma – a **mortality rate of 2.1 deaths per 100,000 population**.

More than **9 in 10** of the exposure assessment participants were assessed as having **possible or probable exposure** to asbestos.

WHO Occupational Burden of Disease Application tool



Australia


Rate (per 100,000 of population) of deaths from tracheal, bronchus, & lung cancer attributable to occupational exposure to silica in 2016
Female
Male
Both
Age group
≥95 years
90-94 years
85-89 years
80-84 years
75-79 years
70-74 years
65-69 years
60-64 years
55-59 years
50-54 years
45-49 years
40-44 years
35-39 years
30-34 years
25-29 years
20-24 years
15-19 years
0.0
2.5
5.0
7.5
Rate (per 100,000 of population)

PROJECT OBJECTIVES

- Identify High Quality/High Impact Occupational Health Leading and Lagging Indicators
- Crowdsource anonymised Occupational Health data that can be used for voluntary and deidentified reporting
- Generate an interactive dashboard that can be used by industry to better appreciate what good worker health looks like

BENEFITS

Identify and highlight work groups at Significant Risk to Health

Help businesses improve occupational health performance management

Generate action to minimise and control health risks

Focus on prevention through occupational health performance

Evaluate changes in workforce occupational health risks

METHOD

METHODOLOGY

01 Literature Review

Jan 2024 – June 2024

✓Identify key occupational health indicators using a grading approach.

02 Interactive Workshops

Jan 2024 to Jun3 2024

✓Refine the identified KPIs and crowdsourcing methodology.

03 Data Collection

Jun 2024 – Dec 2-24

✓An electronic questionnaire via various occupational health and safety online forums.

04 Reinforcement

Jan 25 – June 25

✓Interactive dashboard in Microsoft Power BI. A Whitepaper and Journal.

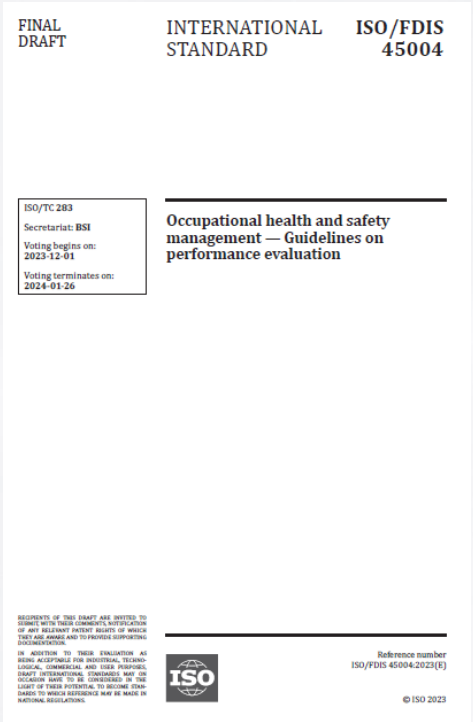
DEFINITION

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. (WHO 2020)

DEFINITION

Occupational health is an area of work in public health to promote and maintain highest degree of physical, mental and social well-being of workers in all occupations.

What to measure? Expanding the scope to health



FINAL DRAFT

INTERNATIONAL STANDARD

ISO/FDIS 45004

ISO/TC 283
Secretariat: BSI
Voting begins on: 2023-12-01
Voting terminates on: 2024-01-26

Occupational health and safety management — Guidelines on performance evaluation

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

Reference number
ISO/FDIS 45004:2023(E)

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The organization should use health surveillance programmes to identify signs or symptoms of ill health.

To understand OH&S performance, the organization should measure and monitor exposure to health hazards, such as:

— chemical (e.g. liquids, gases, other airborne contaminants);

— biological (e.g. toxins, viruses, bacteria, fungi, animal bites);

— physical (e.g. excessive heat or cold, noise, radiation, vibration);

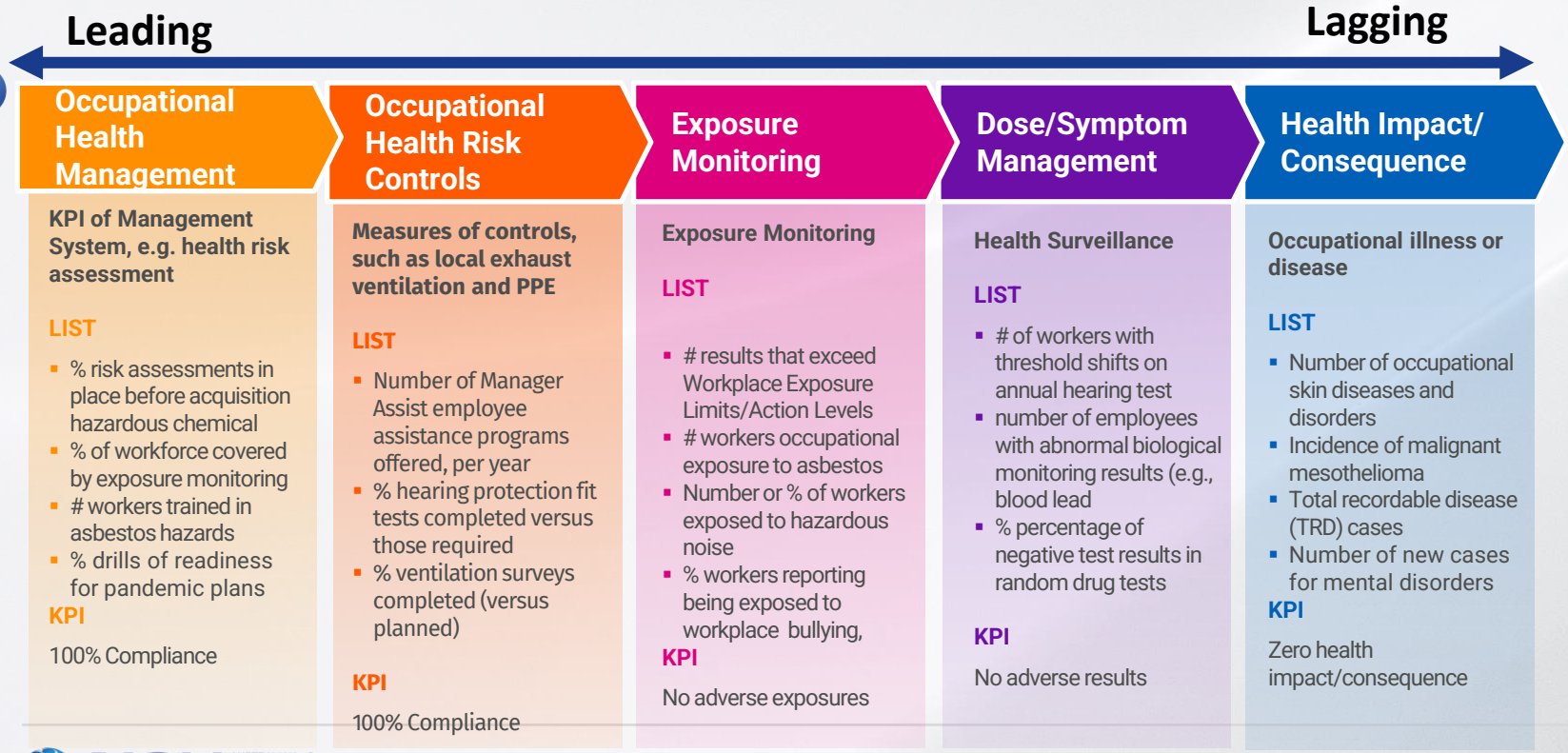
— psychosocial (e.g. work overload, bullying, stress);

— ergonomic (e.g. repetitive movement, tasks requiring awkward postures, manual handling).

The organization should take into account that it can take months or years before negative effects of exposure result in symptoms of ill health. The organization should combine the data from health surveillance and exposure assessments. The organization can take into account additional information resulting from worker information including vulnerable groups (e.g. pregnant women, disabled workers) and surveys to evaluate the effectiveness of controls and identify opportunities for improvement.

The organization should protect the confidentiality of the personal health surveillance data.

Spectrum of Occupational Health Indicators



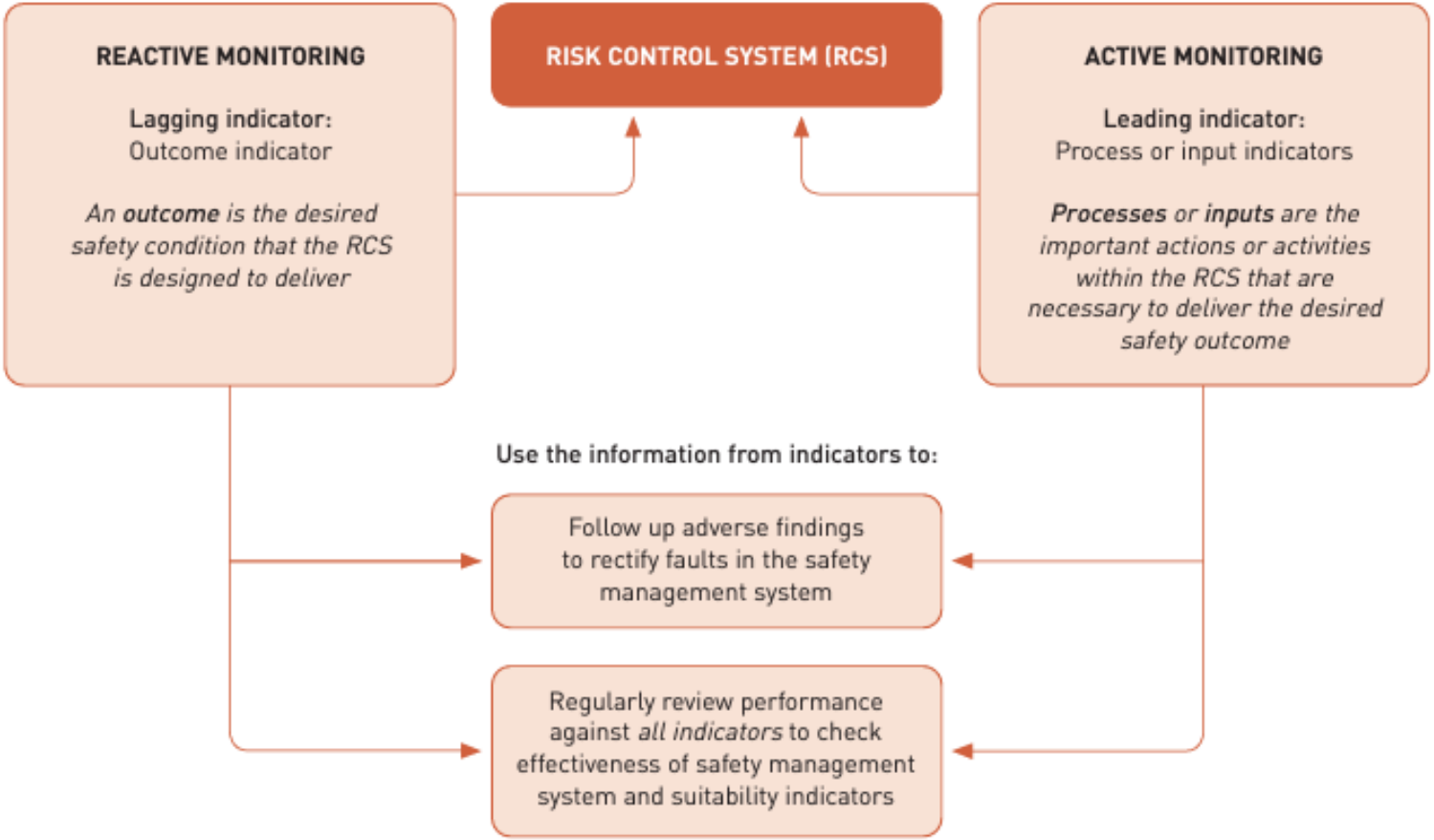
Source: Adapted from HSE (2009)

WHAT IS S.M.A.R.T Health METRIC?

- Is it monitoring a significant health impact?
- Is the health outcome clear?
- Will it add value to worker health protection?
- Can the metric be measured?
- Is the data routinely collected?
- Is the data collection tools reliable?

SOURCES OF INFORMATION

- Exposure assessments
- Occupational Health Surveillance
- Injury and ill health tracking
- Inspections and audits
- Pre-activity and post-activity review
- Workplace Surveys
- Investigations
- Management review
- Interviews
- Focus Groups
- Risk Assessments
- Risk Registers



Source: Health and Safety Executive (HSE) 2006.

Lagging Indicators:

Lagging Indicators

- Retrospective indicators that measure after-the-fact occurrences e.g. illness rates (AIHA 2020)
- Not preventative
- Reactive
- Evaluate system effectiveness

Examples of Health Lagging Indicators

- Workers' compensation data
- Occupational Illness and Disease rates*
- Absenteeism
- Exposure to hazardous substances

Poll 1

- Please provide examples in the chat box

Does your industry utilise **lagging** health performance indicators?

Examples of Lagging Indicators

Hazard Identification			
Category	**Lagging Indicator**	**Justification**	**Reference**
Fatigue	Total hours worked by employees and contractors doing work related activities	Identification of long work hours which will increase risk of incidents associated with fatigue	ICMM (2021)
Human Factors and Ergonomics	Number of workers exposed to occupational ergonomic risk factors	Demonstrate ergonomic risk factors	AIHA (2001)
Health Hazards	Number of health hazards/risks identified in incident reports that were not on the risk register (adapted)	Information acquired from incidents	O'Neill and Wolfe (2017)
Thermal Environment	Percentage of workstations with inappropriate thermal conditions	Identify thermal conditions that can pose a risk to health	Vosoughi et al. (2020)
Psychological Safety	Number of workers reporting being exposed to psychosocial hazards in the last 12 months: bullying, harassment, job demands, remote or isolated work etc	Demonstrates prevalence of psychological hazards	AIHA (2020)

Examples of Lagging Indicators

Occupational Exposure			
Category	**Lagging Indicator**	**Justification**	**Reference**
Aerosols	Number of workers with occupational exposure to asbestos	Help prioritise hazards for elimination or control	Pega et al. (2022)
Aerosols	Number of workers with occupational exposure to silica	Help prioritise hazards for elimination or control	Pega et al. (2022)
Chemicals	Number of chemical substances of very high concern used (i.e., carcinogenic, mutagenic, or toxic to reproductive organs and/or bio-accumulative and toxic to the environment.)	Help prioritise CMR hazards for elimination	Naylor (2024)
Biological	Number of exposures to bloodborne pathogens i.e., splashes	Help prioritise hazards for elimination or control	AIHA (2001)
Noise & Vibration	Number or % of workers exposed to hazardous noise	Help prioritise hazards for elimination or control	AIHA (2001)

Example of Lagging Indicators

Assessment of Risk			
Category	**Lagging Indicator**	**Justification**	**Reference**
Aerosols	Number of results that exceed Workplace Exposure Limits/Action Levels (of total number of workers monitored)	Short term verification of critical control systems	ISO 450004 (2023)
Ionising Radiation	Number of workers on Ionising Radiation Exposure assessment/dosimetry below Action Level	Short term verification of critical control systems	AIHA (2001)
Noise & Vibration	Number or % of workers exposed at work to noise > 8hr TWA of 85 decibels (dBA) measured on the A weighting network	Defines scope of noise exposed workers	AIHA (2001)

Example of Lagging Indicators

Health Surveillance			
Category	**Lagging Indicator**	**Justification**	**Reference**
Metals	Number of employees with abnormal biological monitoring results (e.g., blood lead)	Short term verification of critical control systems	ACOEM (2021)
Noise & Vibration	Number of audiometry results with presence of an audiometric notch	Short term measure of hearing conservation program effectiveness	Liebenberg, A., et al. (2021).
Noise & Vibration	Number of audiometric results with threshold shifts on their annual hearing tests	Short term measure of hearing conservation program effectiveness	AS/NZS 1269.4 (2014)
Fitness for Work	Number of negative test results in random drug tests	Short term verification of fitness for work	Rubio-Romero, J. C., et al. (2018).
Health Assessment	Number of total abnormal findings from occupational medical exams	Measure of total worker health	AIHA (2001)
Health Assessment	Number of workers approved for work vs, non-approved	Measure of program results	ISO 45005 (2023)

Example of Lagging Indicators

Injury and Ill Health Tracking			
Category	**Lagging Indicator**	**Justification**	**Reference**
Noise & Vibration	Number of new cases of work-related noise induced hearing loss	Long term measure of hearing conservation program effectiveness	ACOEM (2020)
Aerosols	Number of mesothelioma cases diagnosed (and reported to the AMR) with occupational exposure	Long term measure of critical control systems	AMR (2019)
Aerosols	Number of workers compensation claims for respiratory diseases	Long term measure of critical control systems	SWA (2006)
Chemicals	Acute Work-Related Pesticide Poisonings Reported to Poison Control Centers	Potential fatal/irreversible health impact.	CSTE (2005)
Thermal Environment	Number of occupational heat-related emergency department visits	Potential fatal health impact	CSTE (2005)
Skin Exposures	Total Number of occupational skin diseases and disorders	Long term measure of critical controls for dermal exposures	NIOSH (2004)

Example of Lagging Indicators

Corrective Action			
Category	**Lagging Indicator**	**Justification**	**Reference**
Indoor Air Quality	Number of indoor air quality complaints resolved	Extent of health hazards eliminated or controlled	AIHA (2001)
Ergonomic and human factors	Percentage of workplaces needing adaption for workers with specific needs (e.g. for pregnant workers, workers with a disability)	Measure total number of risk factors to help prioritise jobs or taks that should receive ergonomic analysis	ISO 45004 (2023)
Psychological Safety	Number of employee assistance programs sessions taken up by employees per year	Tracking incidence of psychological events/impairment	IOGP (2024)
Psychological Safety	Number of incidents Employee assistance professionals conduct critical incident debriefing (CID)	Tracking completion of risk control actions	ACOEM (2020)
HAZMAT	Number of hazards abated on the same day, week, or month in which the hazard was identified.	Efficiency that health hazards eliminated or controlled	OSHA (2019)

Example Lagging Indicators

Management of Change			
Category	**Lagging Indicator**	**Justification**	**Reference**
Chemical	Number of incidents in which new purchases (e.g. equipment, substances, materials) are not checked against Safety Management System Requirements	Measure total number of incident to prioritise HRA	ISO 45004 (2023)
Chemical	Number of incidents in which safety data sheets for hazardous substances are not obtained from providers or are out of date	Identify number of non-compliant SDS	ISO 45004 (2023)

Leading Indicator:

AIHA

HEALTHIER WORKPLACES | A HEALTHIER WORLD

Center for Safety & Health Sustainability

Best Practice Guide for Leading Health Metrics in Occupational Health and Safety Programs

Guidance Document

aiha.org

Version 1 | September 9, 2020

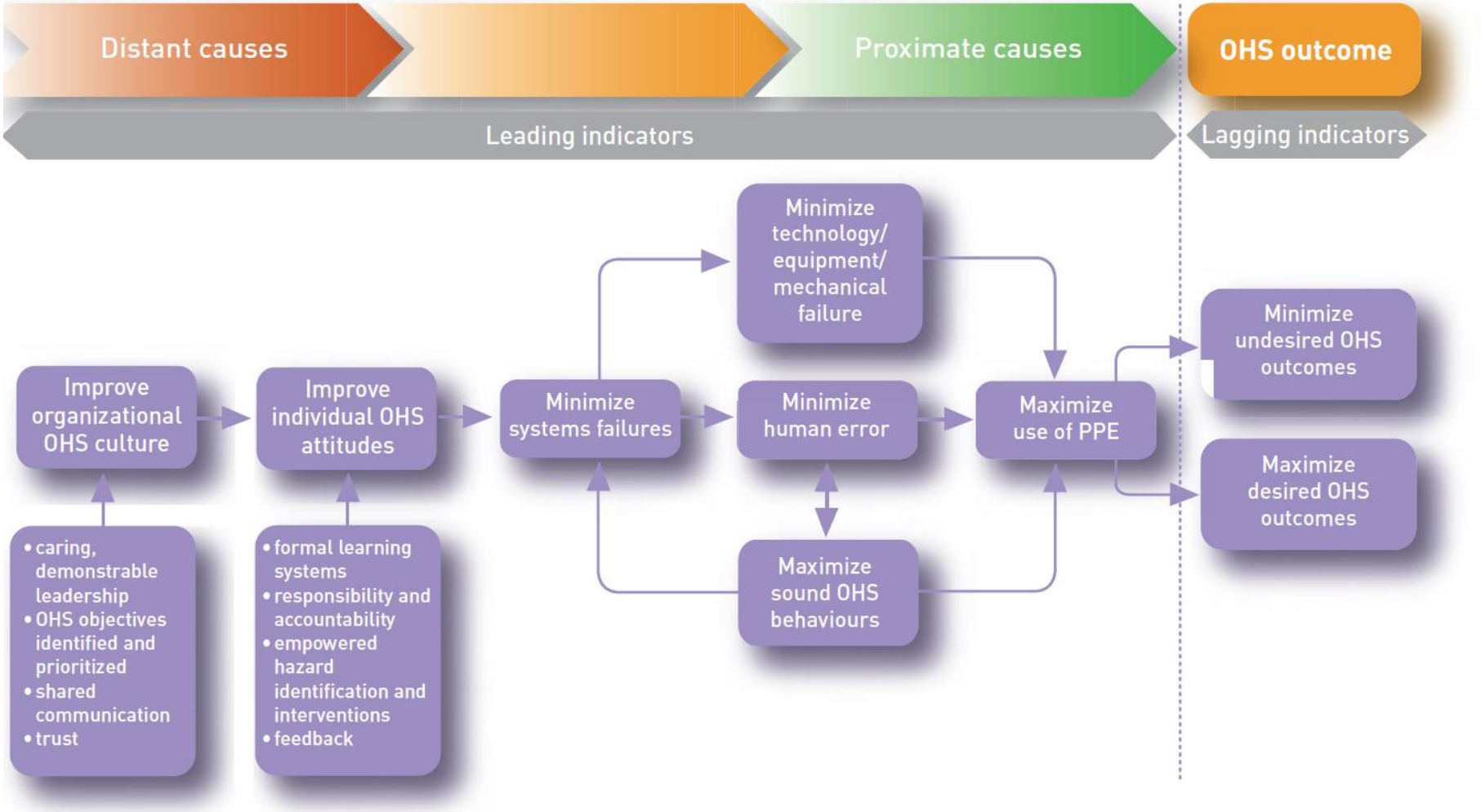
Poll 2

- Please provide examples in the chat box

Does your industry utilise **leading** health performance indicators?

Leading Indicators

- A “prospective” set of metrics that indicate the performance of key work processes
- Proactive risk identification
- Preventative


Distant causes
Proximate causes
OHS outcome
Leading indicators
Lagging indicators
Improve organizational OHS culture
Improve individual OHS attitudes
Minimize systems failures
Minimize technology/ equipment/ mechanical failure
Minimize human error
Maximize sound OHS behaviours
Maximize use of PPE
Minimize undesired OHS outcomes
Maximize desired OHS outcomes
• caring, demonstrable leadership
• OHS objectives identified and prioritized
• shared communication
• trust
• formal learning systems
• responsibility and accountability
• empowered hazard identification and interventions
• feedback

Source: ICMM

Examples of Health Leading Indicators

Top Management Commitment			
Category	**Leading Indicator**	**Justification**	**Reference**
Health Risk Management	Number of investigated potential fatal occurrences/extreme health risks and exposures investigated by executive management	Top-down/whole organisation approach to health risk management	ICMM (2021)
Health Risk Management	Number of health risks assigned to officers for oversight	Top-down/whole organisation approach to health risk management	ICMM (2021)
Exposure Assessment/ Health Surveillance	Aggregate results of exposure assessments and occupational health surveillance presented to upper management on regular basis	Top-down/whole organisation approach to health risk management	Sorenson et al., (2013)

Examples of Health Leading Indicators

Planning Action			
Category	**Leading Indicator**	**Justification**	**Reference**
Psychological Safety	Number of employee assistance programs offered, per year to employees	Adequate support and resources for workers	ACOEM (2021)
Psychological Safety	Manager Assist employee assistance programs offered, per year to employees	Adequate support and resources for people managers	Naylor (2024)
Emergency Preparedness	Trained personnel have been made available to meet established response times for first aid, emergency medical care, and evacuation (local or international)	Adequate support and resources for emergency response	IOGP (2023)
Biological Hazards	Number drills and assessments of readiness for pandemic plans	Adequate support and resources for pandemic response plans	ACOEM (2021)

Examples of Health Leading Indicators

Training			
Category	**Leading Indicator**	**Justification**	**Reference**
Hazard Identification	Number/% workers trained in health impacts by number of workers or by facility	Awareness and knowledge of health hazard and control	AIHA (2020)
Psychological Safety	Number of worksites that provide educational materials on stress management	Adequate support and resources for workers	CSTE (2005)
Fitness for Work	Education and awareness on drug and alcohol abuse	Awareness and knowledge of health hazard and controls	Bayramova, A., et al. (2023).

Examples of Health Leading Indicators

Legal Requirements and Other Compliance Requirements			
Category	**Leading Indicator**	**Justification**	**Reference**
Aerosol	Percentage of workplaces whose work areas were inspected by Regulators for Silica (adapted)	Degree of enforcement activities	CSTE (2005)
Exposure Assessment	Locations participating in Occupational Hygiene monitoring activities	Identify level to which health risks have been assessed	US Navy (2018)

Examples of Health Leading Indicators

Assessments of risks			
Category	**Leading Indicator**	**Justification**	
Health Risk Assessment	Number health risk assessments completed as compared to health risk assessments planned	Degree of HRA completion	AIHA (2020)
Health Risk Assessment	Percentage of updated risk assessments due to potential exposures to chemical, biological and physical agents	Degree of HRA completion	ISO 45004 (2023)
Exposure Assessment	Change in exposure risk categories, e.g. decrease of number of employees in A of B exposure categories	Identifies quality of exposure control plans	ICMM (2012)

Examples of Health Leading Indicators

Health Surveillance			
Category	**Leading Indicator**	**Justification**	**Reference**
Fitness for work	Tasks that need specific medical fitness requirements (including any psychological assessments as required), have been identified though health risk assessment	Roles requiring health surveillance are identified	IOGP (2023)

Examples of Health Leading Indicators

Consultation and Participation of Workers			
Category	**Leading Indicator**	**Justification**	**Reference**
Wellbeing	Number of sites with gym/other environmental supports for recreation or physical activity	Establishment of wellbeing facilities	CSTE (2005)
Biological Hazards	Number or % of vaccinations (e.g., influenza, hepatitis A) coverage among workers (e.g., healthcare, food handlers)	Monitor degree of worker participation	CSTE (2005)
Health Risk Assessment	Occupational hygienist and/or occupational health expertise (as appropriate) is used to assess and advise on the implementation of appropriate controls and work practices to eliminate or minimise exposures to Physical, Chemical, Biological or Ergonomic Hazards	Establishment of SME Review	IOGP (2023)
Wellbeing	Number/% of workers who participate in health promotion and wellness activities	Monitor degree of worker participation	ACOEM (2020)

Examples of Health Leading Indicators

Actions to control risk			
Category	**Leading Indicator**	**Justification**	**Reference**
Ventilation Systems	Percentage of ventilation systems that achieve acceptable flow rates	Tracking completion of risk control actions	ISO 45004 (2023)
Fitness for Work	Substance abuse program (available to employees)	Organisation has the process in place	Bayramova, A., et al. (2023).
Health Risk Assessment	Number or % identified health risks mitigated or controlled	Tracking completion of risk control actions	NSC (2019)
Wellbeing	Number of workers that stop smoking as result of smoking cessation program	Tracking completion of risk control actions	NSC (2019)

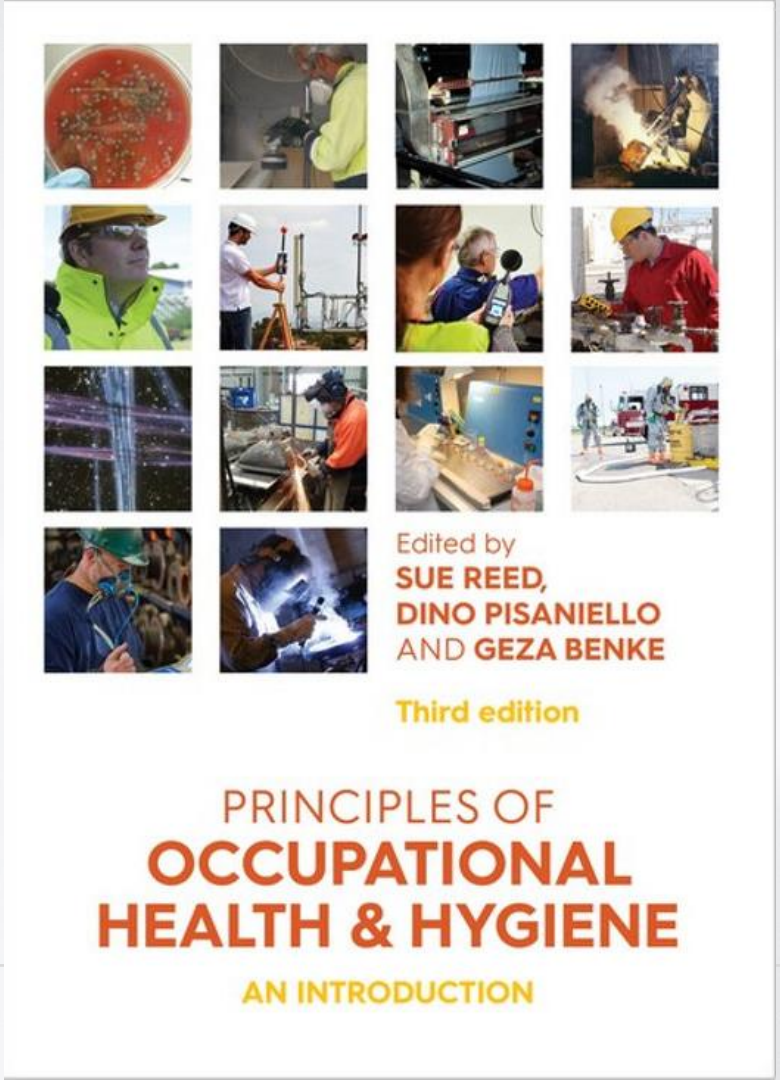
What would you say is an example of a strong **leading health indicator**?

ACTIVITY EXAMPLE: EXAMPLES OF STRONG HEALTH METRICS

- **Health Indicator:** % of severe/extreme health hazards that establish controls in hierarchy of control greater than or equal to level 3 (incl. elimination, substitution and engineering controls) (Source: ICMM 2012)
- **Type:** Leading
- **KPI:** 100% ☺
- **Benefits:** Highest level of protection and most effective control measures to reduce health risk
- **Weaknesses:** Time and cost necessary to introduce control

ACTIVITY EXAMPLE: EXAMPLES OF STRONG HEALTH METRICS

Hazard	Risk Control System
Welding Fume	Eliminate the need to cut
	Substitute with lower fume process or consumables
	On tool extraction
	Use of local exhaust ventilation
	Dilution ventilation (fan)
	Competence and training
	Operational procedures
	Access and correct use of RPE


Edited by
SUE REED,
DINO PISANIELLO
AND GEZA BENKE
Third edition
PRINCIPLES OF
OCCUPATIONAL
HEALTH & HYGIENE
AN INTRODUCTION

Please complete the survey

What do you think good health looks like?

Please provide examples in the chat box

What are the **barriers** to establishing health performance metrics in organisations?

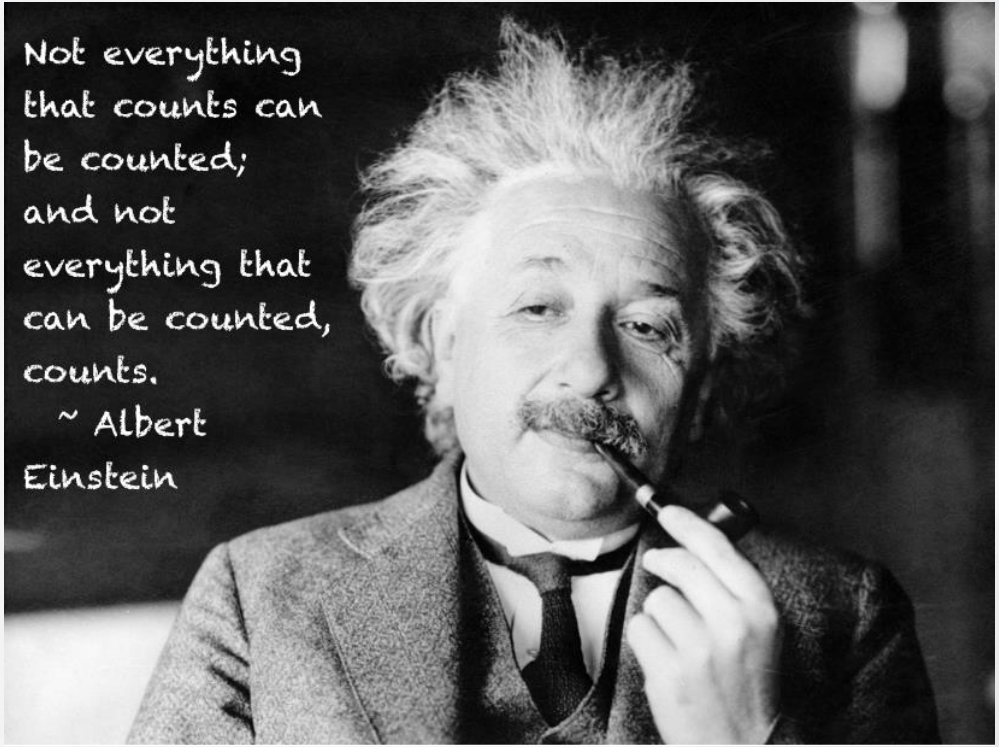
Potential Challenges

- Limited engagement from workers
- Allocation of resources to monitor indicator
- Financial and other non-financial incentives
- Low frequency, but serious/long term impacts overlooked
- Top management support
- Complexity of indicators
- Potential misunderstanding or misinterpretation

KEY MESSAGES

- Occupational Health and Hygiene performance metrics in WHS reporting is important
- Health indicators should integrate health promotion and worker health protection
- Lagging and leading indicators should coexist – emphasis should be on leading metrics
- The AIOH will continue to champion the importance of health metrics to help reliable investment in prevention of worker health impacts and disease

KEY MESSAGES



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Questions?

Please provide your question in the Q&A chat box

Thank you