Making a Difference
Science Impact Framework

Mary D. Ari, PhD
Senior Advisor for Science
Office of Science, CDC

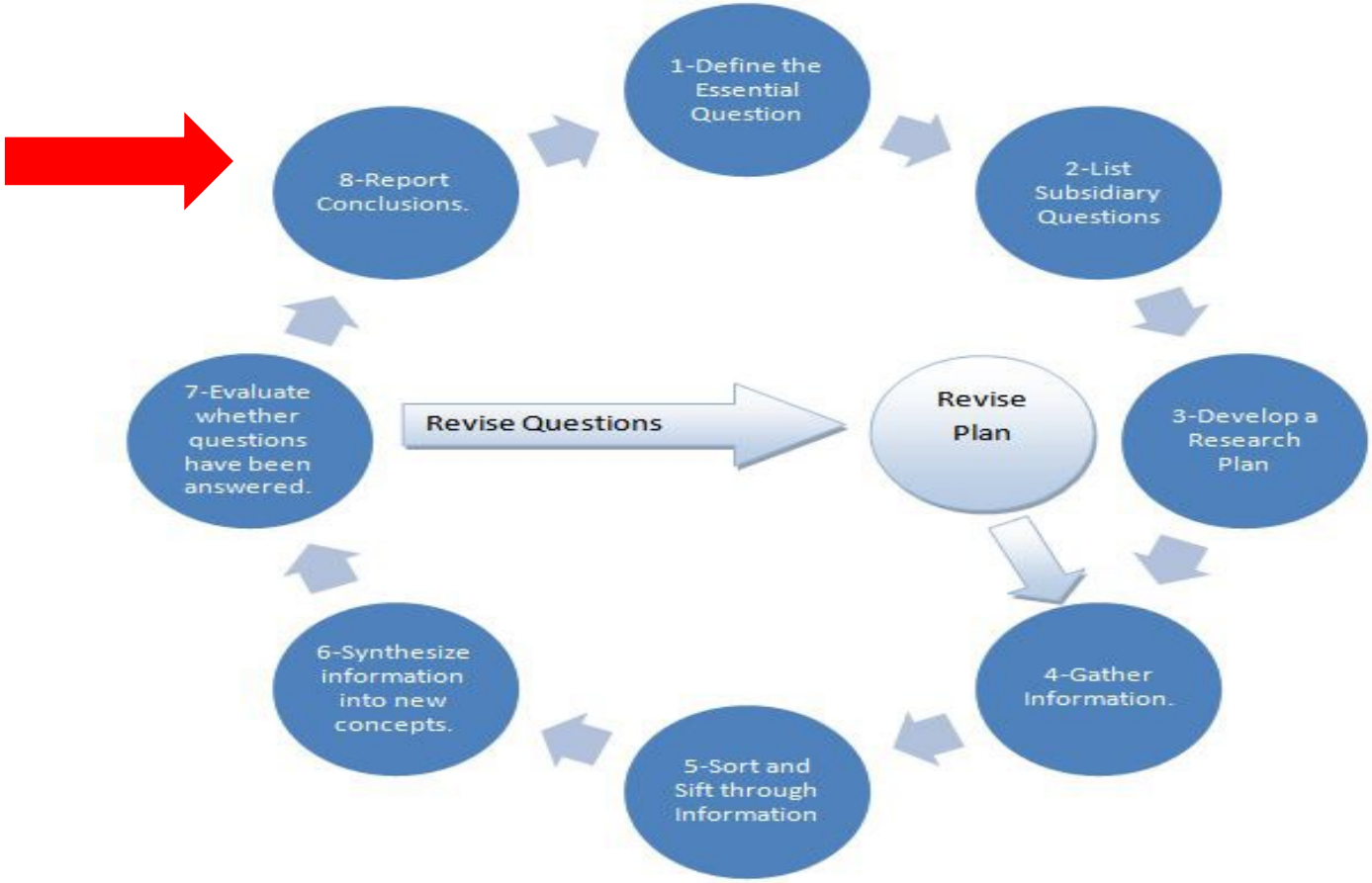
Disclaimer: *"The findings and conclusions in this presentation are mine and my co-authors and do not necessarily represent the official position of the Centers for Disease Control."*

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

What Our Partners and Public Need

- Evidence to support practice or policy or decision making
  - Findings to translate to practice
  - Information to guide practice
  - Actionable information to promote health
- Accountability for public funds
  - Funding initiatives and partnerships
  - Evidence to support prioritization of resources
- Research focus to advocate for research priority
  - Identify research of common interest and researchers to foster collaborations

The Research Cycle



Wiki Space Classroom- Evert Verhagen is an Assistant Professor at the EMGO Institute for Health and Care Research at the VU University Medical Center, Amsterdam, the Netherlands

State of the Art in Measuring Impact of Research

- **Relying solely on bibliometrics is a dated approach**
- **Broader societal, environmental, cultural, and economic value must be taken into consideration**
- **Best practice combines**
  - Narrative
  - Quantitative indicators
  - Qualitative indicators

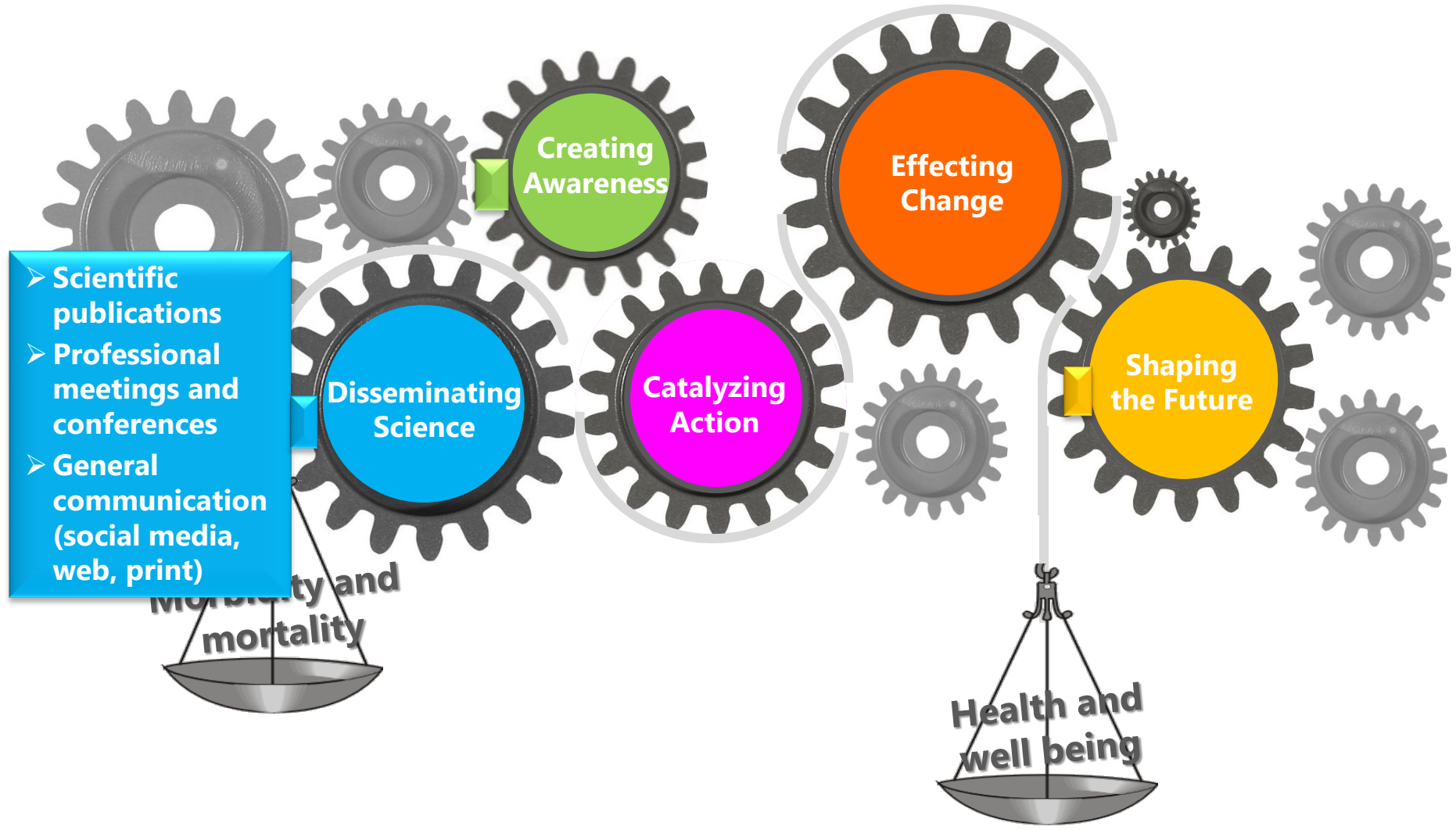
Donovan, Research Evaluation 2011;20(3):175-9

What Is the Impact of Our Work?

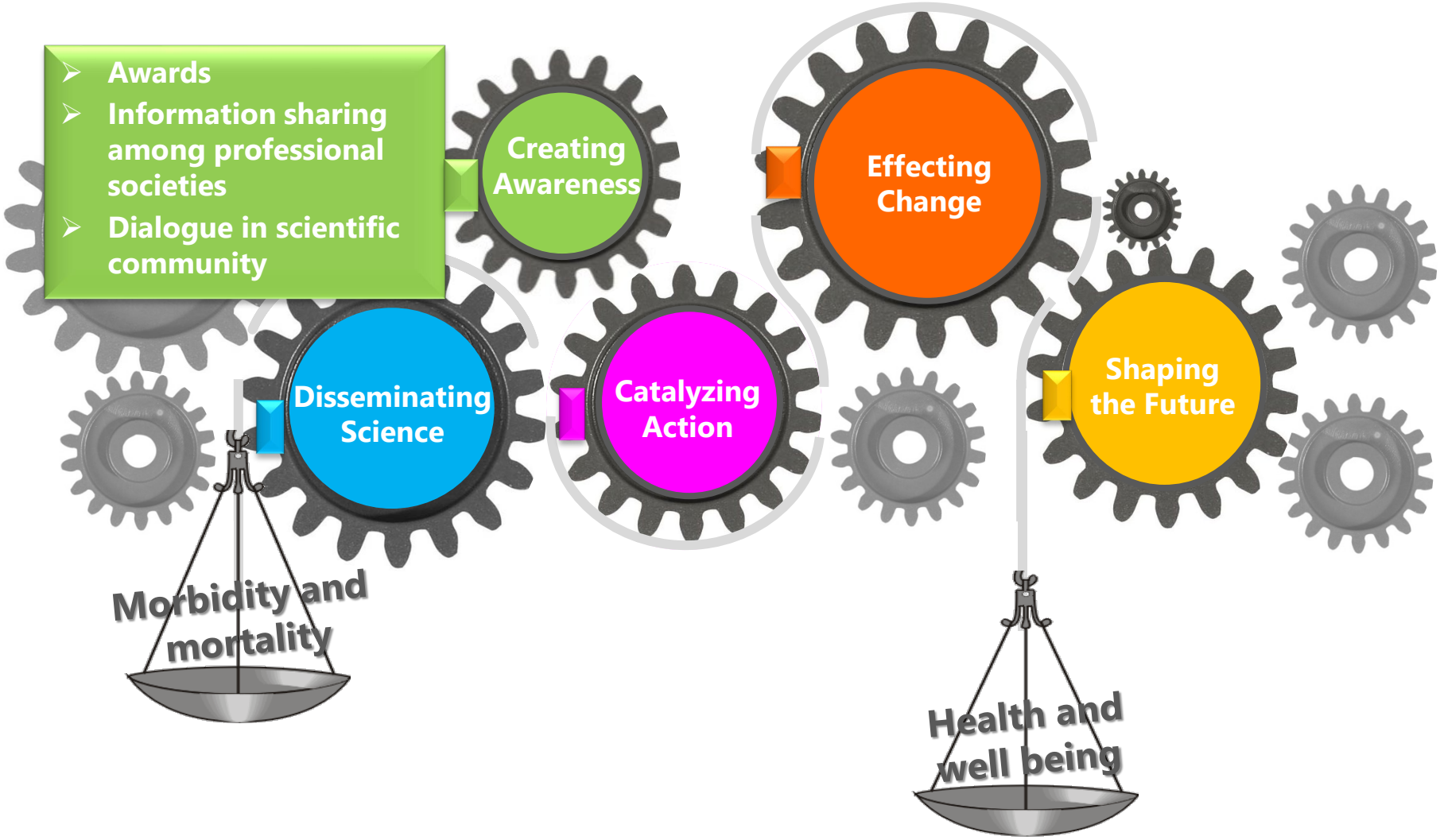
Are YOU Making a Difference?

- **Track retrospectively or monitor prospectively progress and impact of your programs and activities that have strong scientific component**
  - Culture change in impact assessment
    - Emphasis on individual and societal impact (public health angle)
    - Not outputs or number of publications (academic angle)
    - Better understanding of impact on health and well-being of people

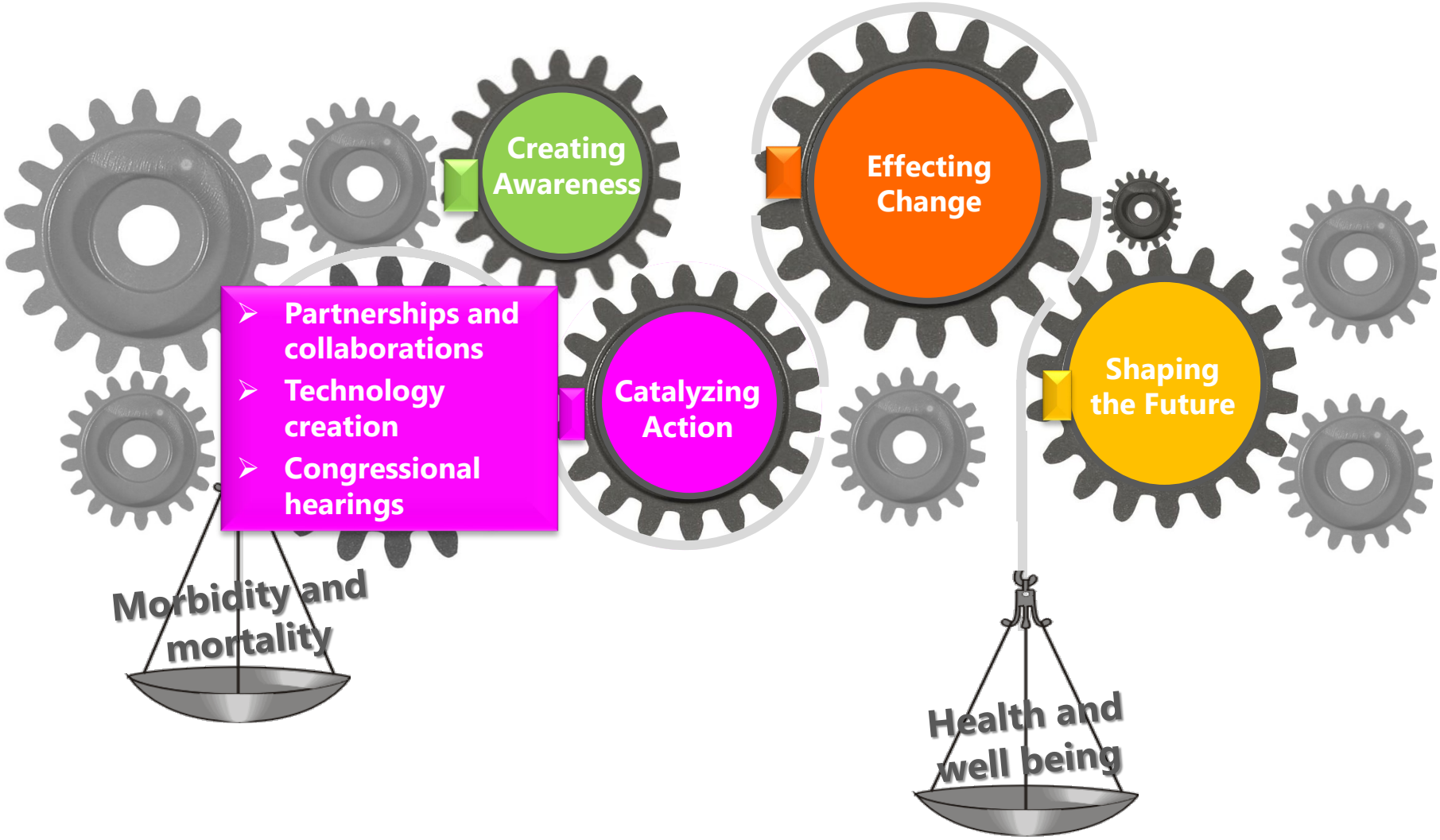
CDC Science Impact Framework
5 Domains of Scientific Influence



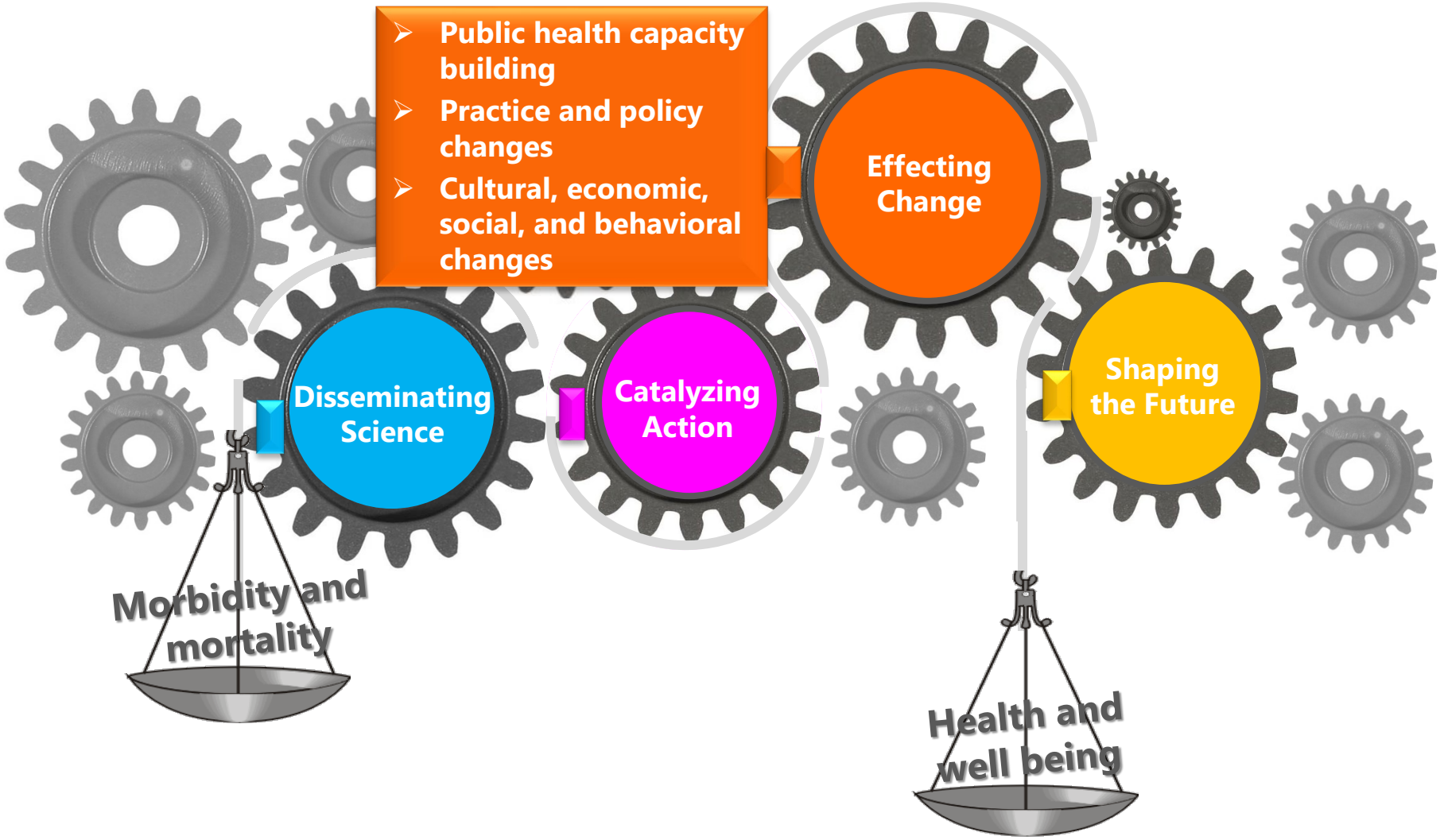
CDC Science Impact Framework
5 Domains of Scientific Influence



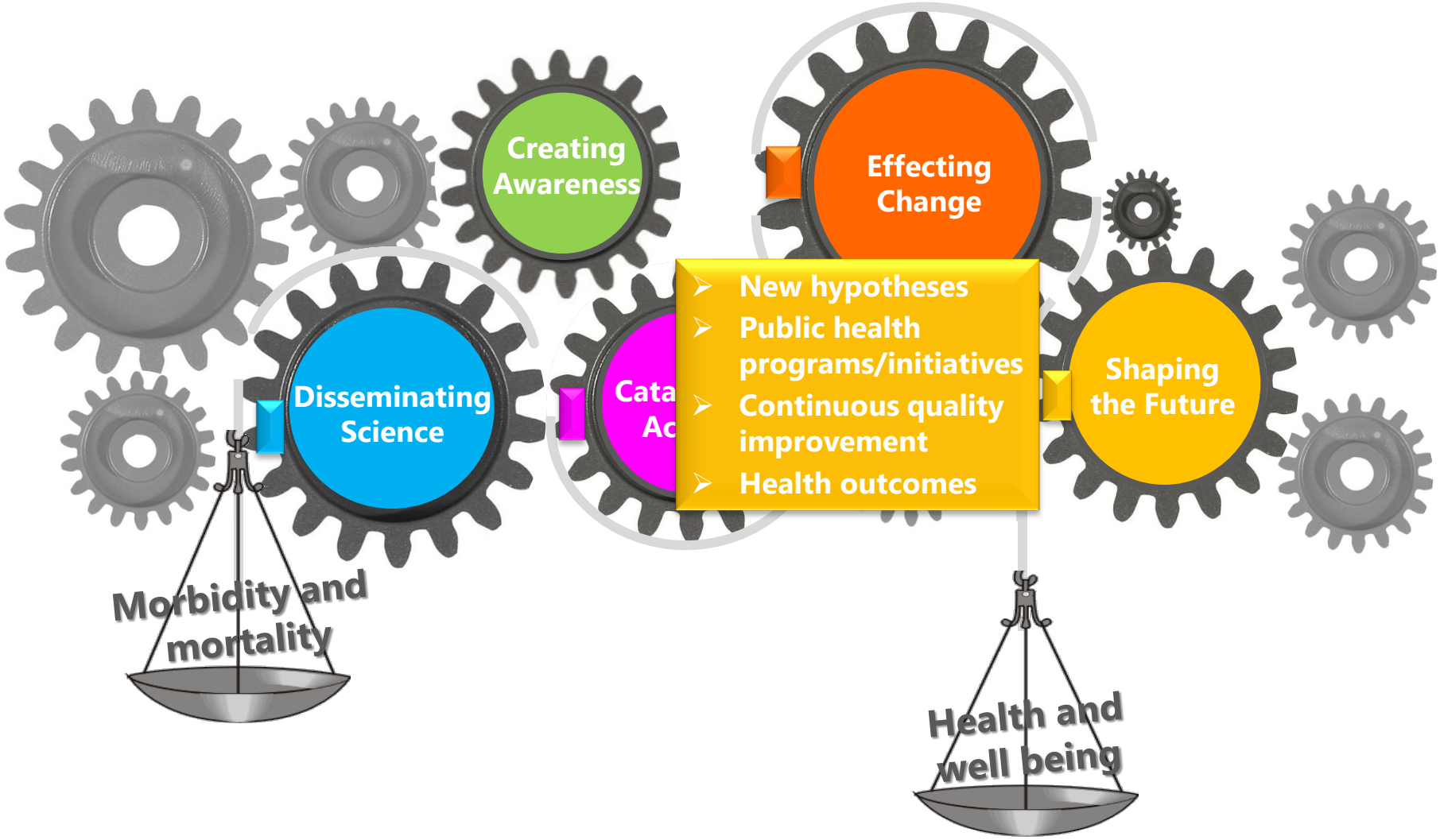
CDC Science Impact Framework
5 Domains of Scientific Influence



CDC Science Impact Framework
5 Domains of Scientific Influence



CDC Science Impact Framework
5 Domains of Scientific Influence



How the SIF Helps!

- **It is about answering the "SO WHAT" question: assessing impact of our work on the society**
  - Important because it allows us to prioritize, sustain, and improve our work
  - The most rigorous scientific work doesn't mean the most impactful work

Because

- Levels of influence = domains of outcomes for science efforts
- Articulates milestones between output → long-term outcomes

Therefore

- How/what to do to get the most influence?
- What situational factors impede/facilitate getting the most influence?

Principles

- **Linking of events prospectively or retrospectively**
  - Contributors
  - Contributions
  - Correct assignment of credit
  - Focus on re-use
- **Short-term indicators that predict long-term impact**
  - Indicators
  - System for tracking evidence of influence

Reugg, R., Jordan, G. 2007

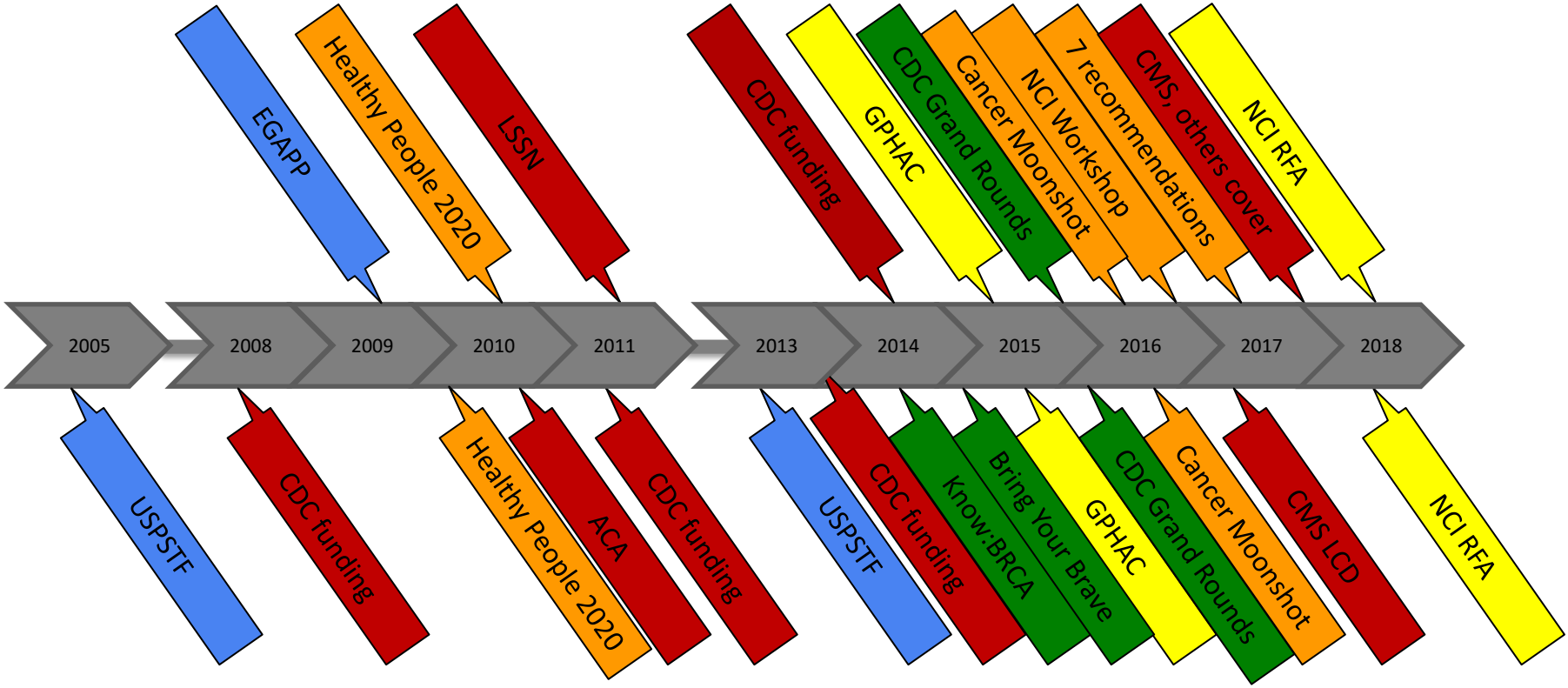
Implementation Options
Data Sources for Links and Associations

Influence	Data Sources*	Example
Disseminating Science	Investigators, MEDLINE, WoS, Google	CDC-authored scientific publications
Creating Awareness	Investigators, Lexis/Nexis, Web	FDA petition
Catalyzing Action	Investigators, registries (patents, trademarks), marketing, legislation	Safer labeling and marketing practices
Effecting Change	Investigators, surveillance systems, G&R	ED visits reduced 50%
Shaping the Future	Investigators, surveillance systems, marketing, G&R	"harm elimination"

*Data Sources are a mixture of stakeholders (who would be experts for identifying the data sources), systems (that can provide the data), and actual measures G&R, guidelines and recommendations

Example of Use- Retrospective

Lynch syndrome



Hereditary breast and ovarian cancer syndrome

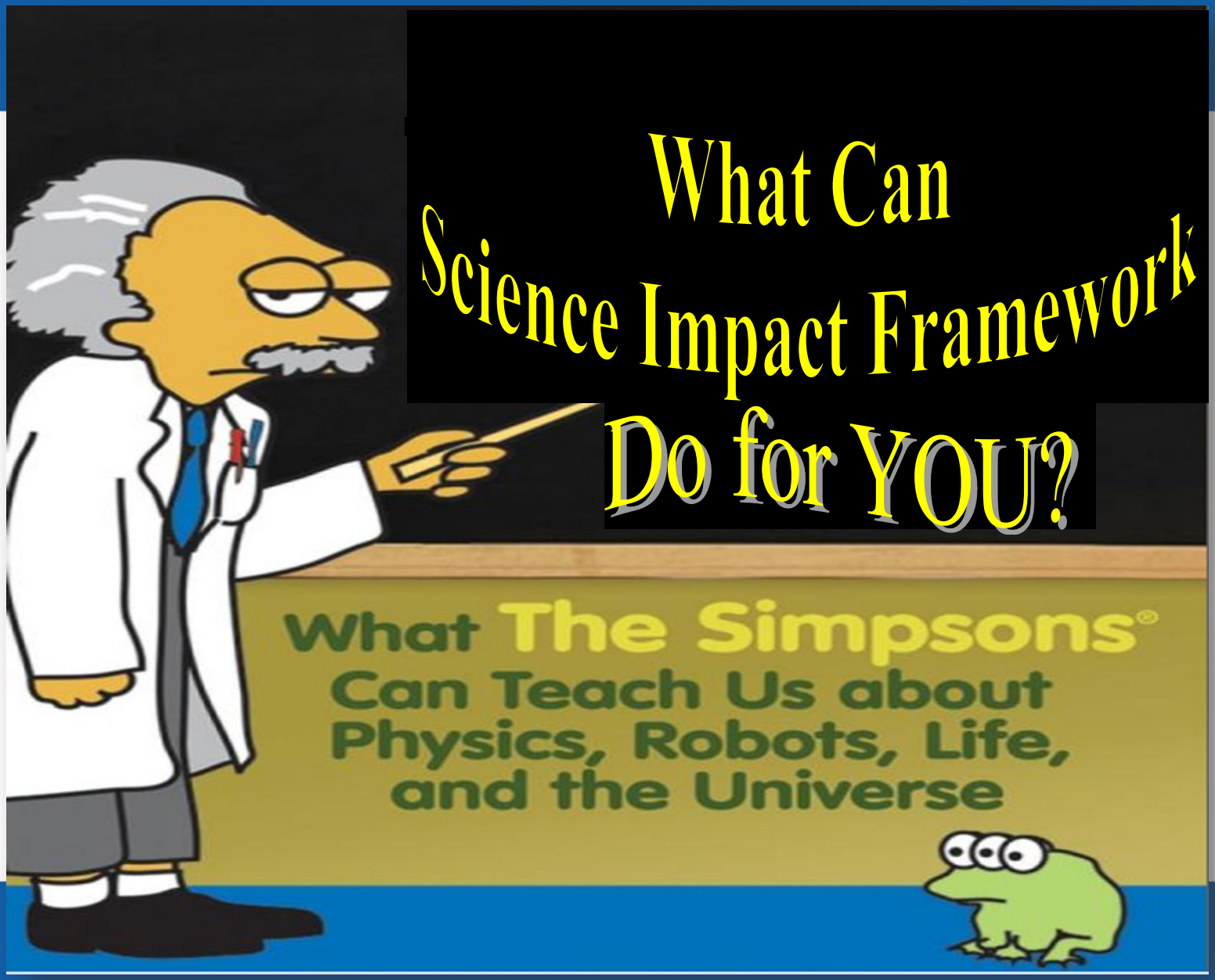
Evaluating the role of public health in implementation of genomics-related recommendations: a case study of hereditary cancers using the CDC Science Impact Framework (nature.com)

Example of Use: Assessment of 2001 NIOSH Survey

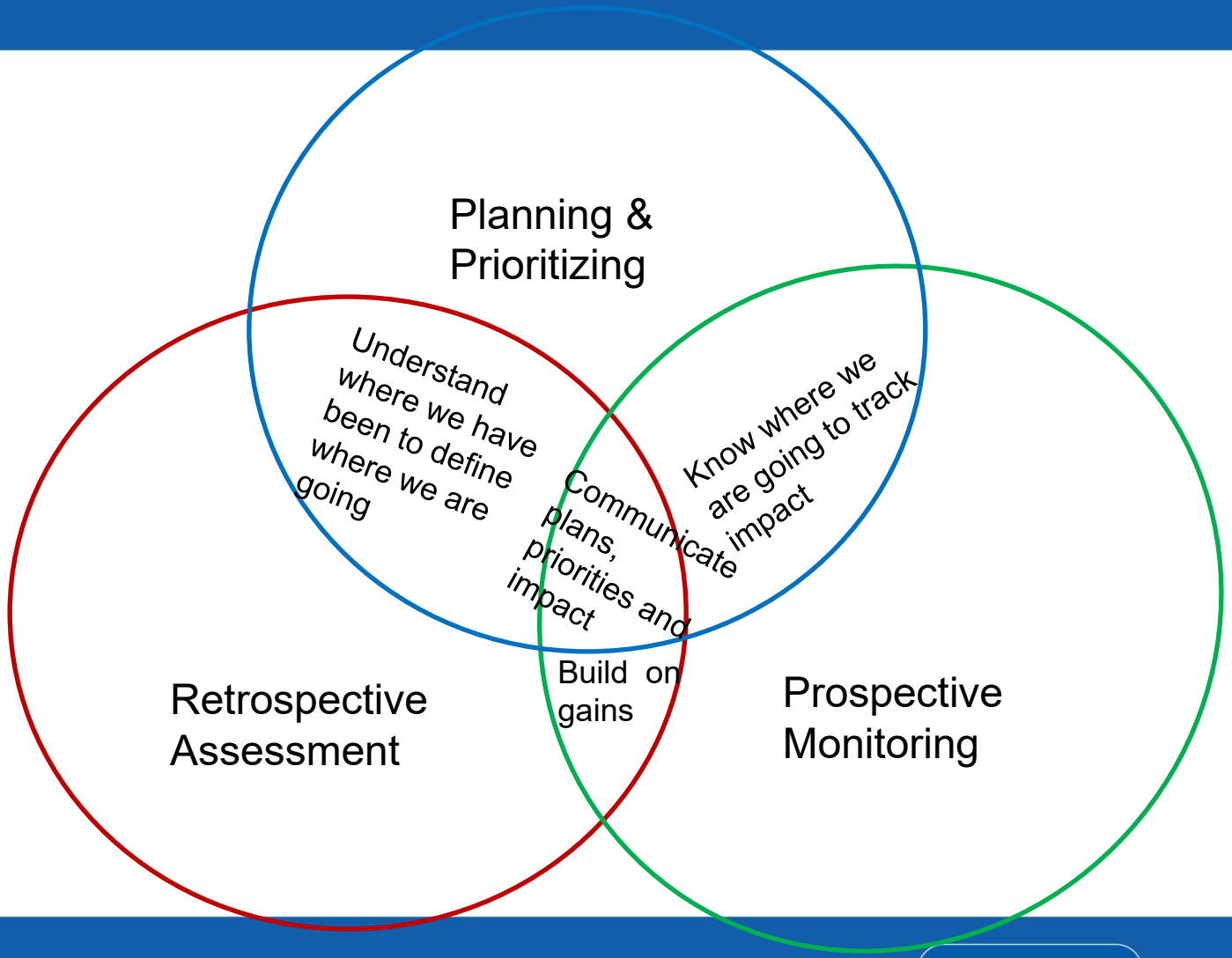
- **Applying the CDC Science Impact Framework to the results of the National Institute for Occupational Safety and Health and the Bureau of Labor Statistics 2001 Survey of Respirator Use and Practices**

Domain of influence	Activities
Disseminating science	27 publications; 36,550 CD-ROMs disseminated; 5,145 printed copies disseminated; Numerous presentations at conferences, meetings, etc.
Creating awareness	Over 600 references in the peer-reviewed and trade journal literature could be traced to the NIOSH publications and the 2001 SRUP; focus groups between NIOSH and trade groups.
Catalyzing action	Numerous research programs were designed and commissioned directly as a result of the 2001 SRUP results; international influence on similar surveys in South Korea and the U.K.
Effecting change	Based on the survey results, OSHA and MSHA issued warnings on the risks involving the inadvertent connection of air-line respirators to inert gas supplies. The results of the survey were used to inform the 2006 respiratory protection standard.
Shaping the future	Current collaboration between the BLS and NIOSH to again administer a voluntary survey of respiratory management and use in the U.S.

Journal of Occupational and Environmental Hygiene Volume 19, 2022 - Issue 6


What Can
Science Impact Framework
Do for YOU?
What The Simpsons®
Can Teach Us about
Physics, Robots, Life,
and the Universe

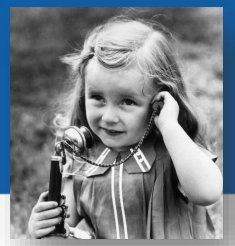
Application of SIF - Evergreen



Application of the SIF

- **What can be assessed?**
  - Established scientific programs and projects
    - Surveillance data and uses
    - Implementation of Research findings in practice and policy
  - Specific scientific documents
    - Impact of guidelines and recommendations on practice
    - Major peer-review manuscripts
    - White papers

SIF in a Nutshell



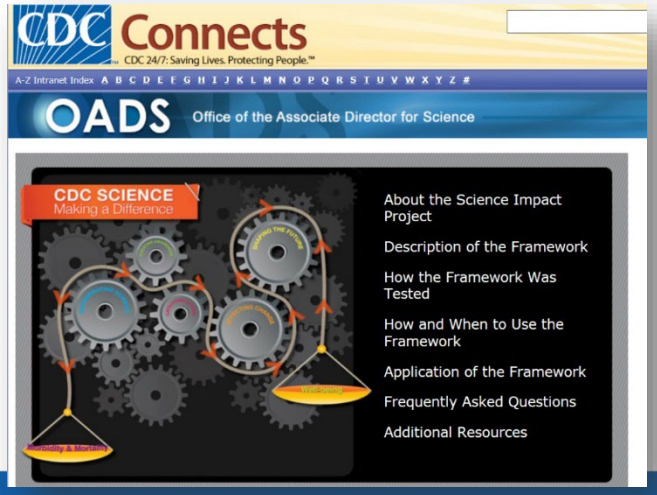
- **Shift from sole reliance on traditional bibliometrics**

- **Multiple benefits from Science Impact Framework**
  - Focus on impact of what we do
  - Assess progress of our projects and initiatives
  - Develop priorities
  - Inform policy
  - Enhance communication with public, partners, and policy makers

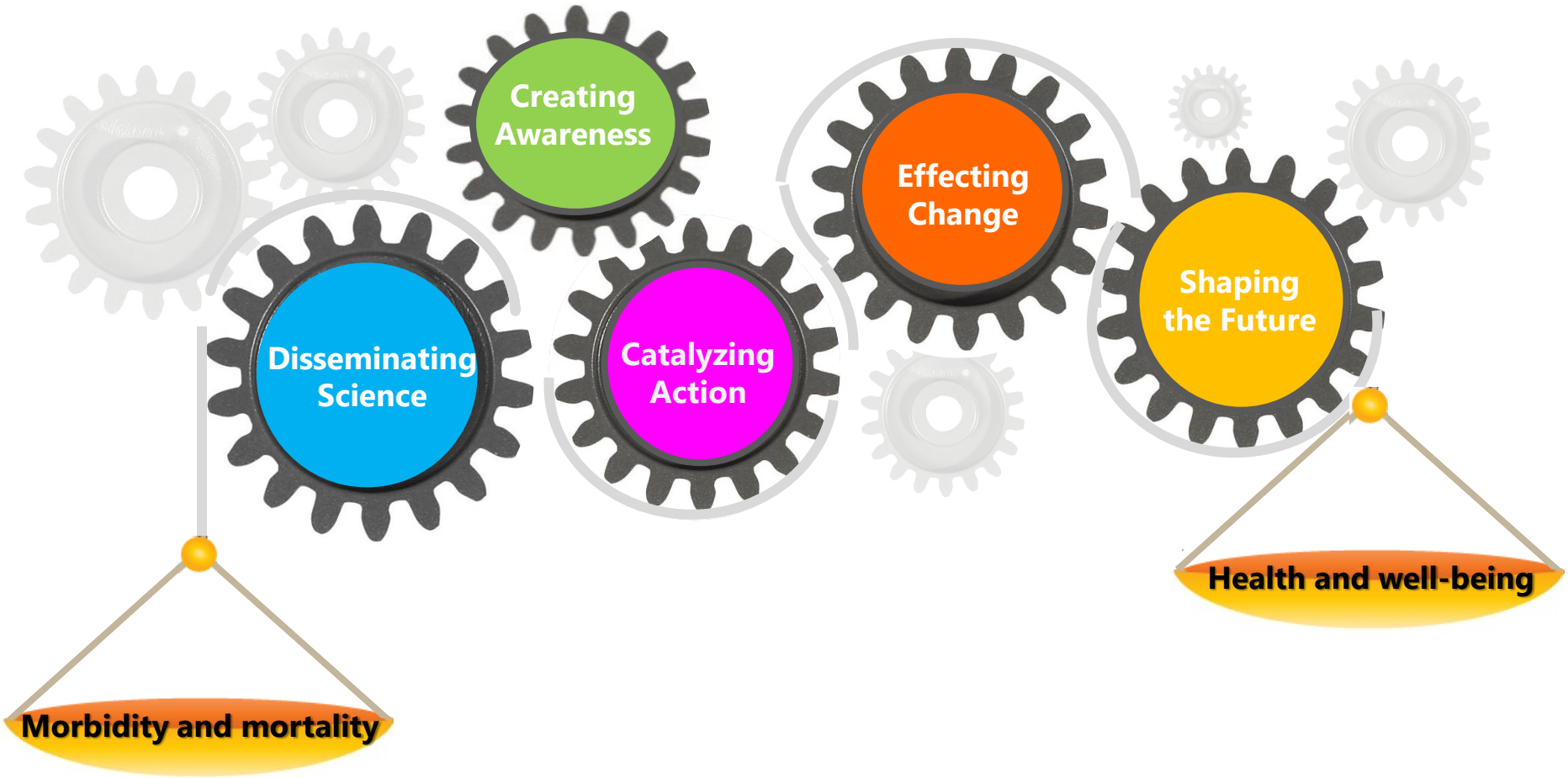
Additional Resources

- Measuring Science Impact Public Health Grand Rounds session Measuring Science Impact | Public Health Grand Rounds | CDC
- Internet site CDC - Science Impact Project - CDC Science Making a Difference - Domains of Influence - SPA – OS
- SIF published

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0244407



Knowing the Impact of Our Work Helps Us Shape Our Future



http://intranet.cdc.gov/od/oads/spa/science-impact/framework.html

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Mary D. Ari PhD
Office of Science
Centers for Disease Control and Prevention
Tel: 404 639 2492
Mari@cdc.gov