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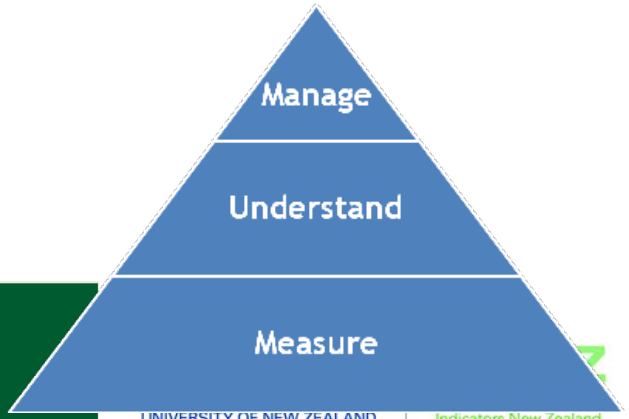
# THE NEW ZEALAND ENVIRONMENTAL HEALTH INDICATOR (EHI) PROGRAMME

Monitoring the environmental health of New Zealand

# “YOU CAN’T MANAGE WHAT YOU DON’T MEASURE” - PETER DRUCKER

**“What Gets Measured Gets Done”**

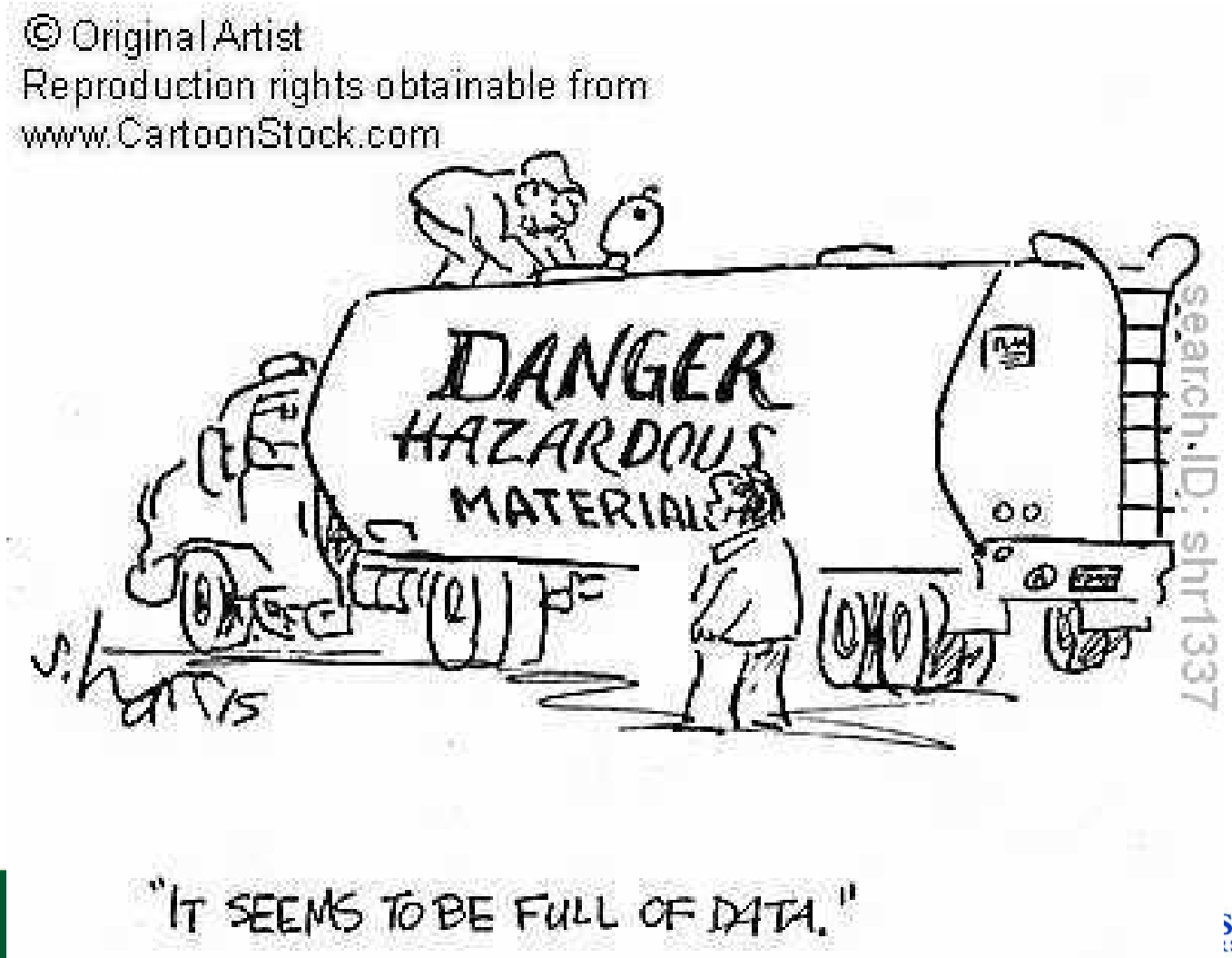



*'If you don't know where you're going, any road will get you there.'*

*Lewis Carroll*

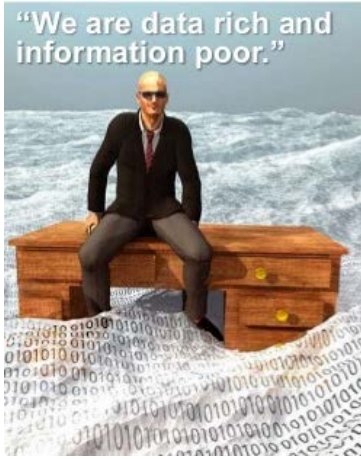
*(Alice in Wonderland)*

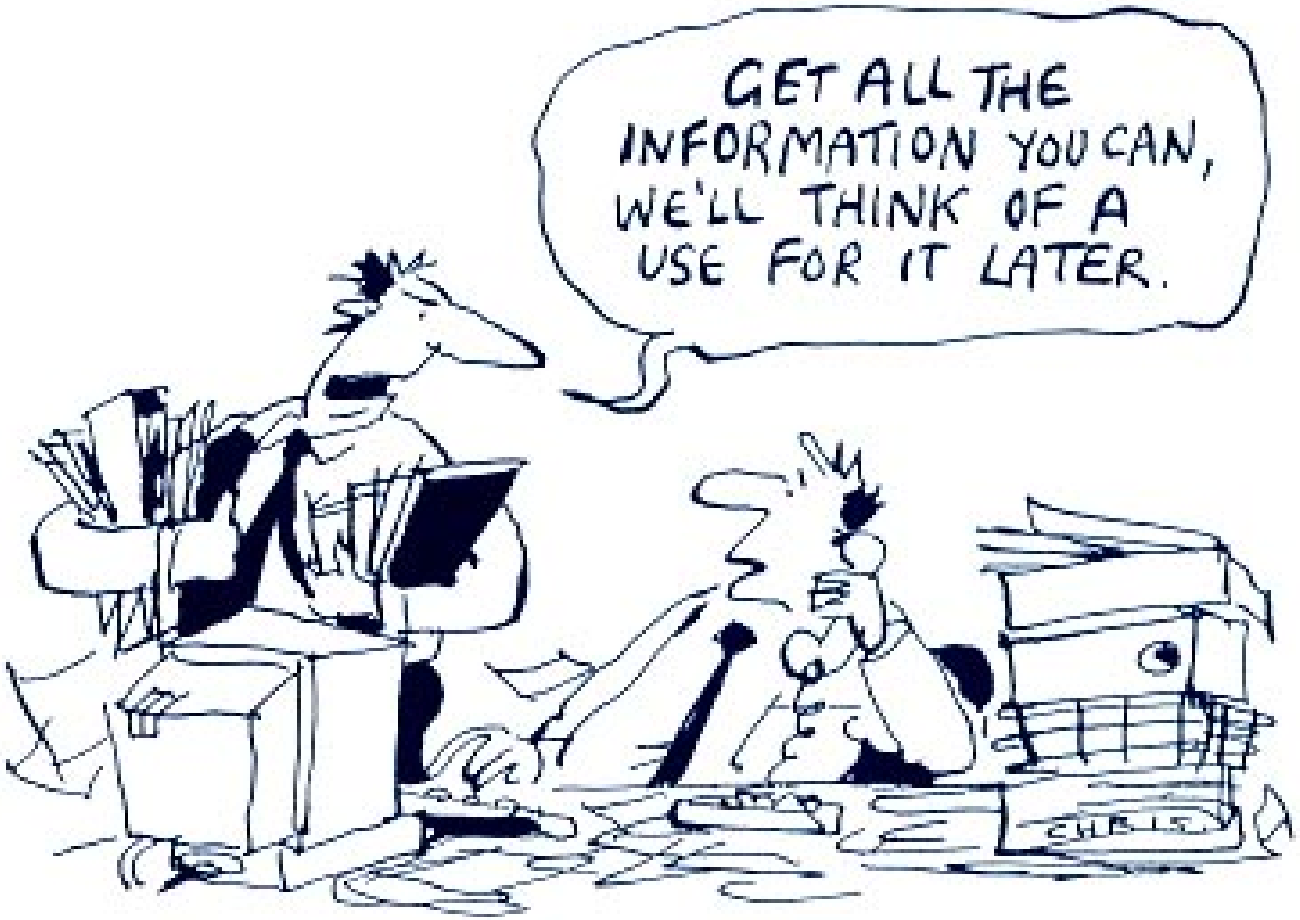
# “TRUCKLOADS OF DATA UNTOUCHED BY HUMAN THOUGHT”



# DRIP - NZ ENVIRONMENTAL HEALTH SYSTEM

## *DATA RICH, INFORMATION POOR*

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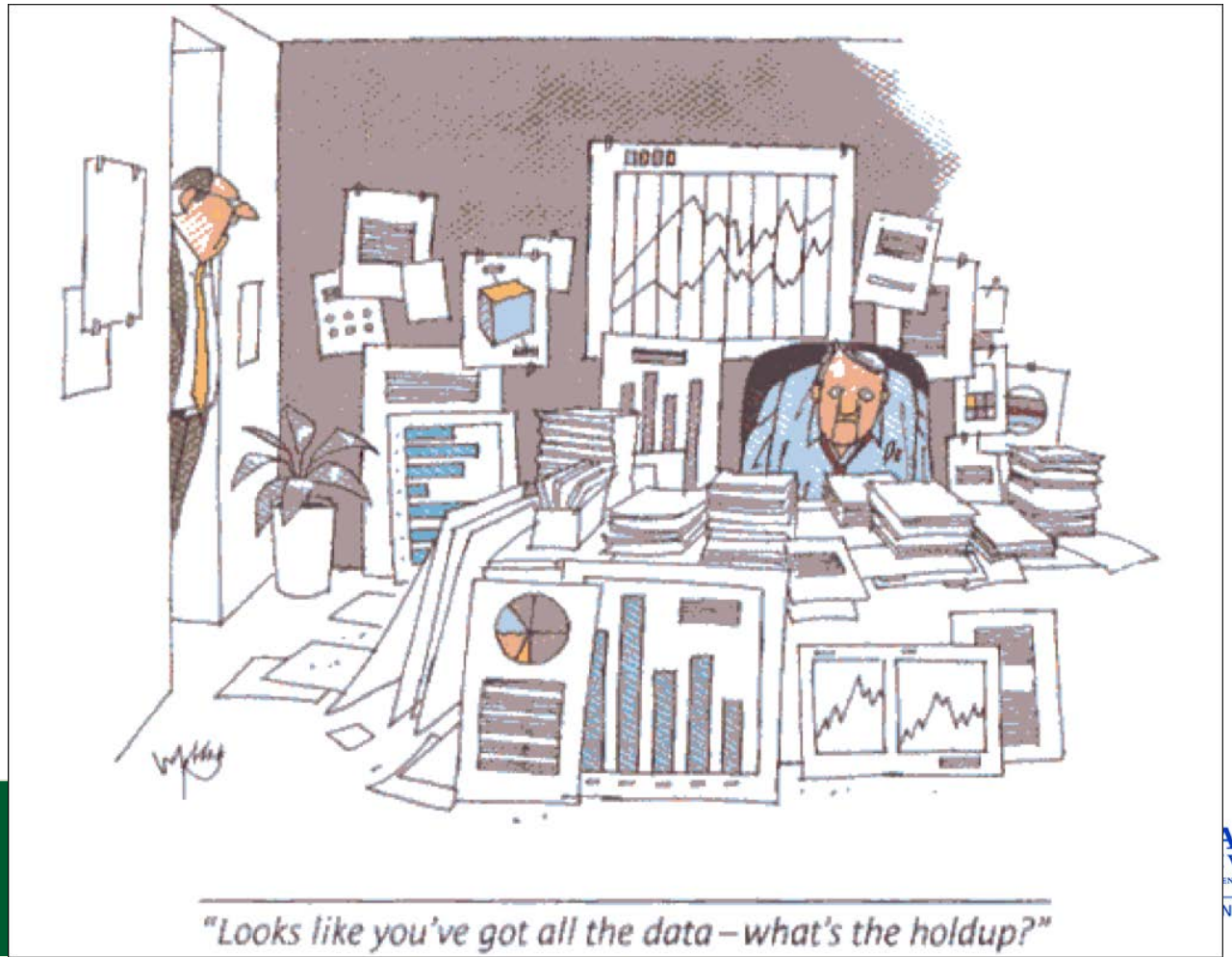
# ERIC D BROWN (2014)

"We are drowning in data but starved for information."



"Looks like you've got all the data – what's the holdup?"

# DATA

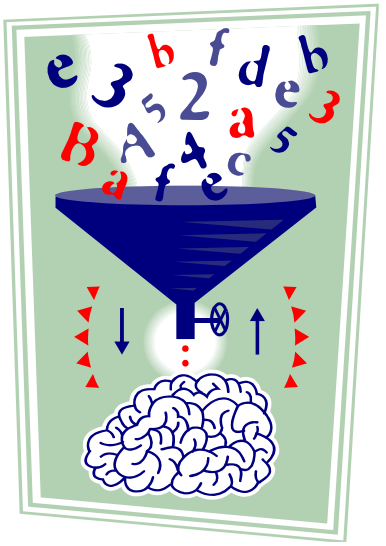
- Non-discriminatory facts or statement of event without relation to other things

- Can be in the form of crude data eg. cost per kg of rose apples

- or processed / summarised data

  eg. a list of apple prices

# INFORMATION



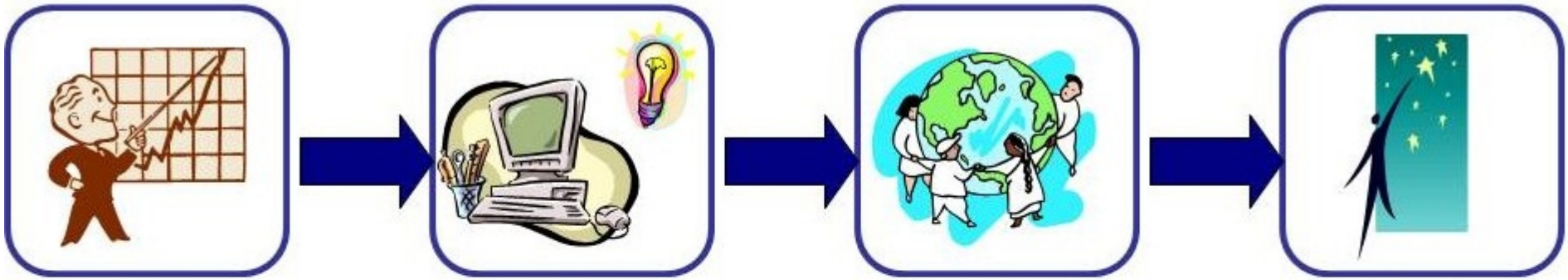
- Based on some shared attributes between datasets
- Understanding of comparative relationships
  - rose apple costs less than granny smith - both types cost more than last year
- Allows scope for choices/decisions, ie. basis of operation
  - more economical to increase stock of pacific rose

# DATA INFORMATION


- 150170
- English
- 23
- 1066

- Lisa's date of birth is 15/01/70
- The conference language is English
- Only 23 days until payment is required
- The computer costs $1066

# DIKW



**Data**

Symbols, signs, Numbers, facts, Without relations to other things

**Information**

Understanding of relations among data, cause-effects

**Knowledge**

Patterns that connect data and has high level predictability

**Wisdom**

Integrated knowledge, understanding of fundamental principle in the knowledge Future outlook

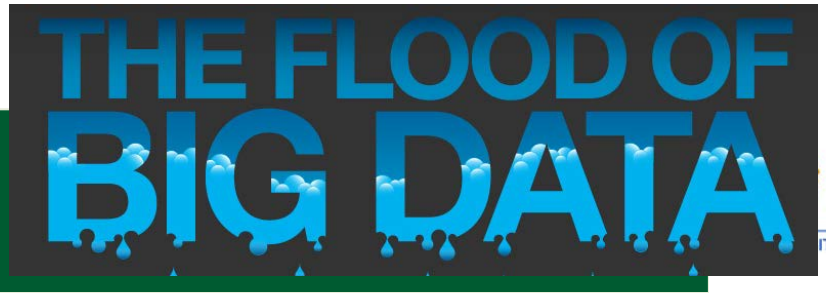
*auroracs.lk*

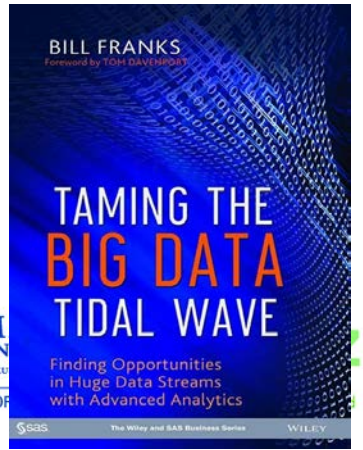
# COMPUTERS = BIG, BIGGER, BIGGEST DATA

"Computers have promised us a fountain of wisdom but delivered a flood of data"

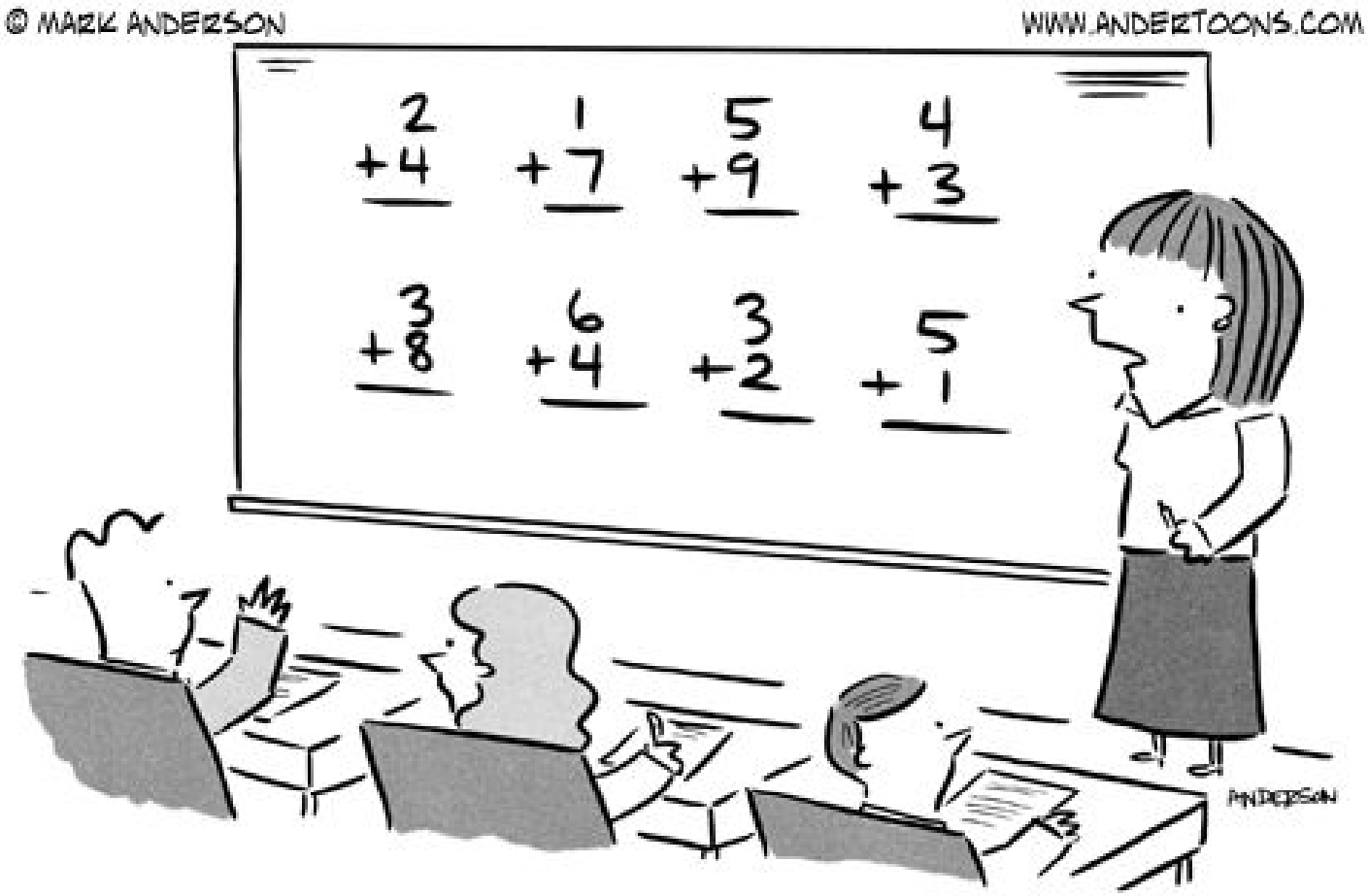
A frustrated MIS executive

*quoted by William J. Frawley, Gregory Piatetsky-Shapiro, and Christopher J. Matheus (1992)*

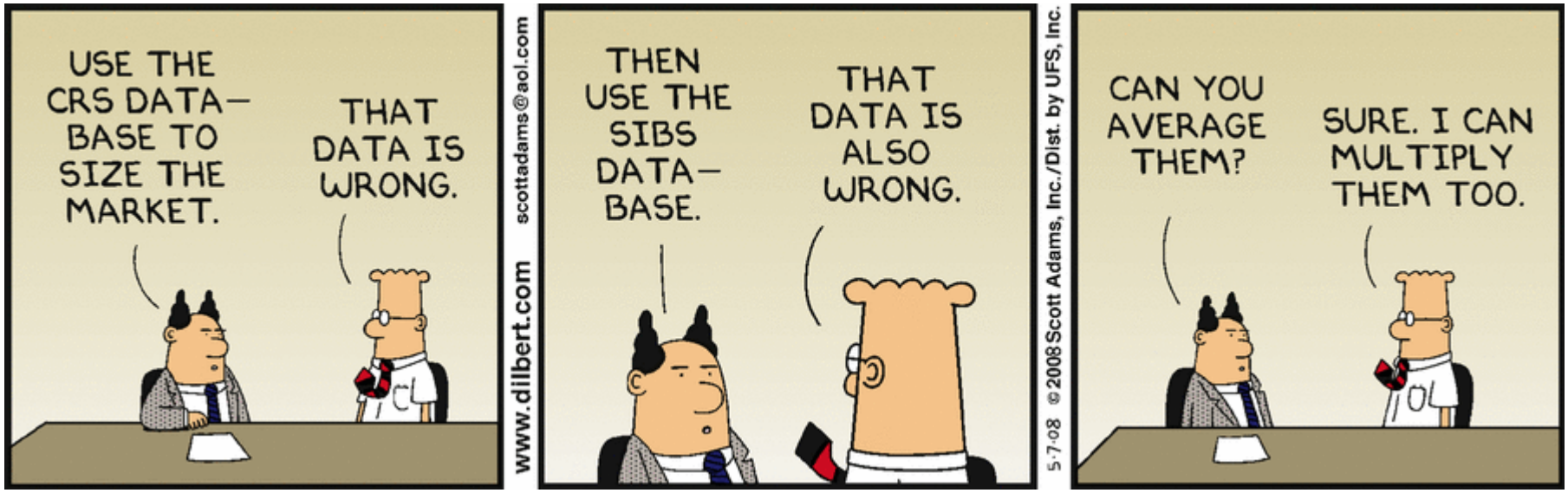



# THE STUDENTS OF TODAY




"Let's solve these first. We can worry about data mining later."


USE THE CRS DATA-BASE TO SIZE THE MARKET.
THAT DATA IS WRONG.
www.dilbert.com scottadams@aol.com
THEN USE THE SIBS DATA-BASE.
THAT DATA IS ALSO WRONG.
5-7-08 ©2008 Scott Adams, Inc./Dist. by UFS, Inc.
CAN YOU AVERAGE THEM?
SURE. I CAN MULTIPLY THEM TOO.

# DATA, INFORMATION, KNOWLEDGE, WISDOM

Data is not information, information is not knowledge, knowledge is not understanding, understanding is not wisdom.

Clifford Stoll

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# THE NEED – NOT THE WANT


- Turn data into information
- More analysis, less data
- More analysts who can analyse, interpret and communicate information
  - Many analysts just analyse
- Greater understanding by senior policy and decision makers of the information driven questions to ask and interpretation and implication of the results

# REPORT FROM PRIME MINISTER'S CHIEF SCIENCE ADVISOR (2013)

## Key Features Of Evidence-Informed Policy Making

1. Quality and accessible data;
2. Robust and accessible data collection and analytical instruments;
3. Critical awareness of analytical assumptions and choices, and of theoretical perspectives that underpin the research methodology;
4. Understanding the limitations of even the most robust evidence;
5. Adjusting expectations of certainty and being able to manage uncertainty.

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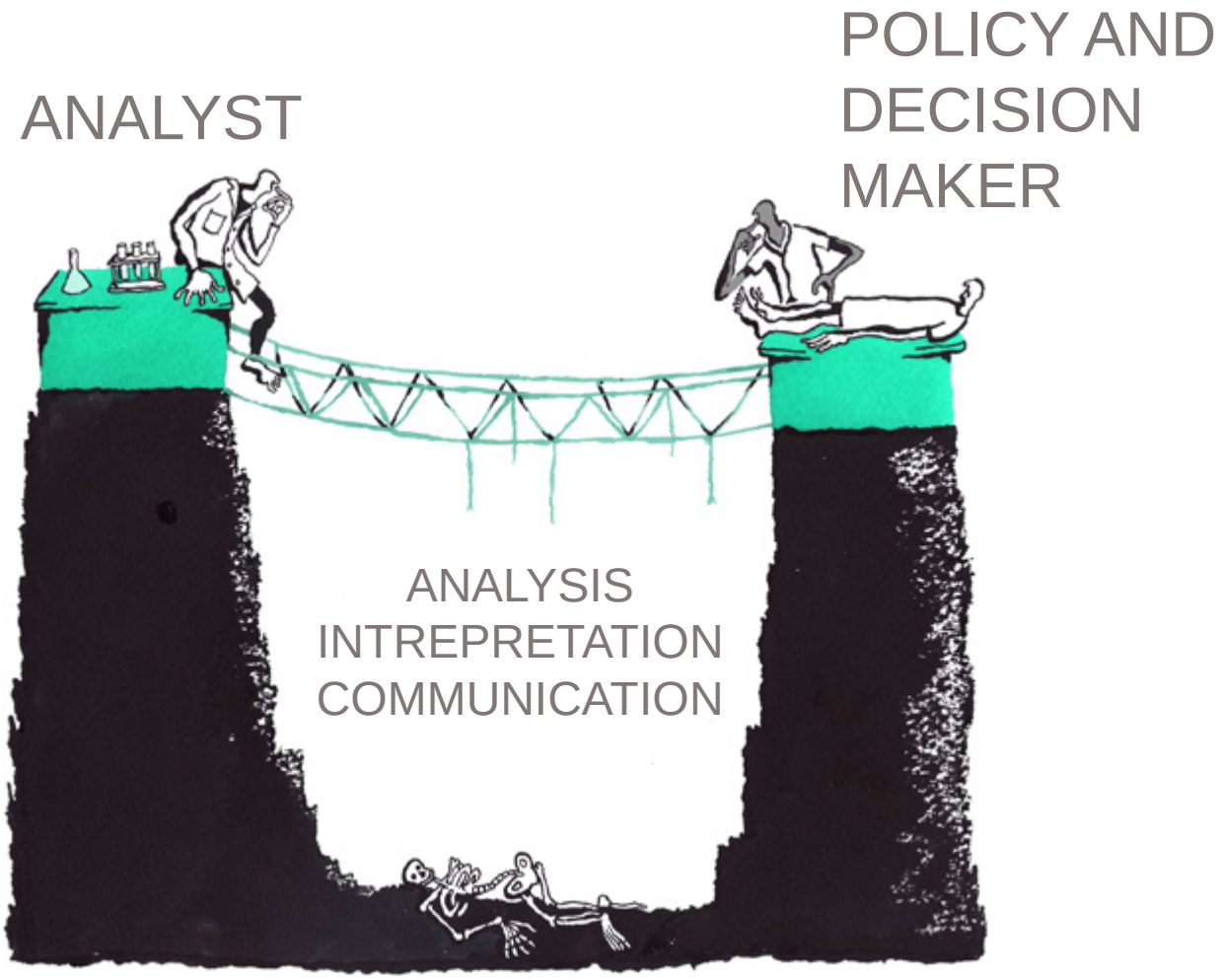
# BERNAND MARR, ADVANCED PERFORMANCE INSTITUTE

- The problem is that most managers are struggling to understand and identify the vital few management metrics and instead collect and report a vast amount of everything that is easy to measure

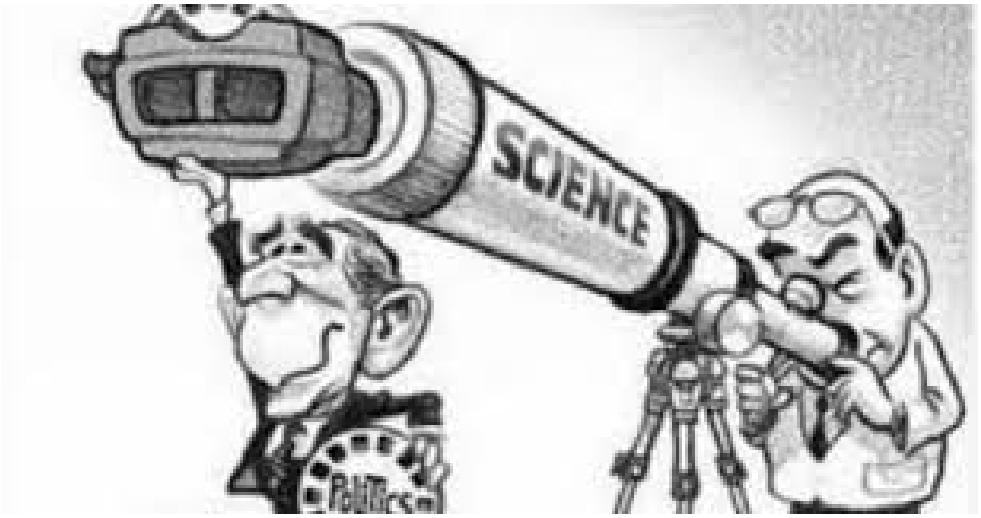
# THE GULF TO BE BRIDGED

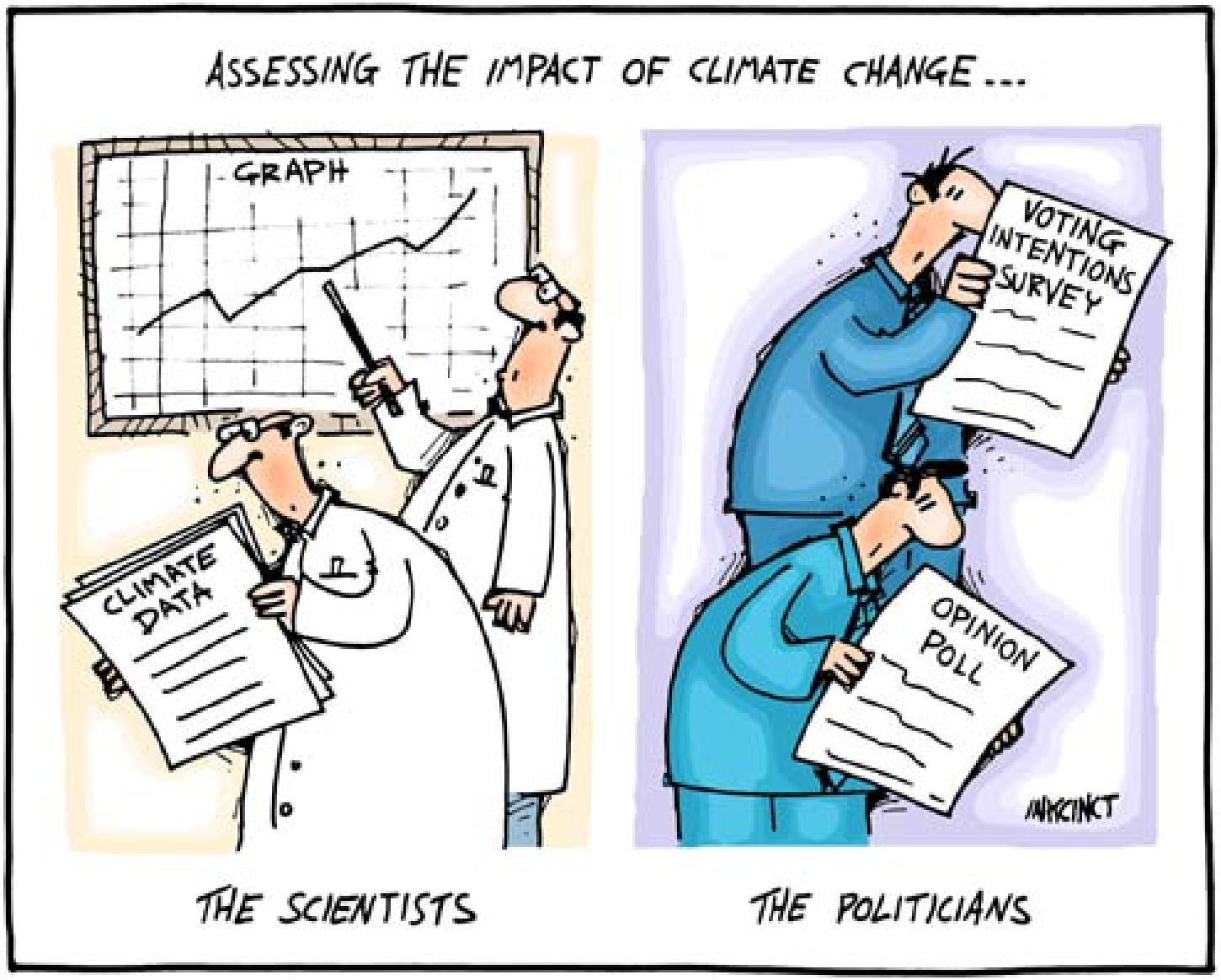



B Mellor, Nature, 2008

# EVIDENCE BASED POLICY

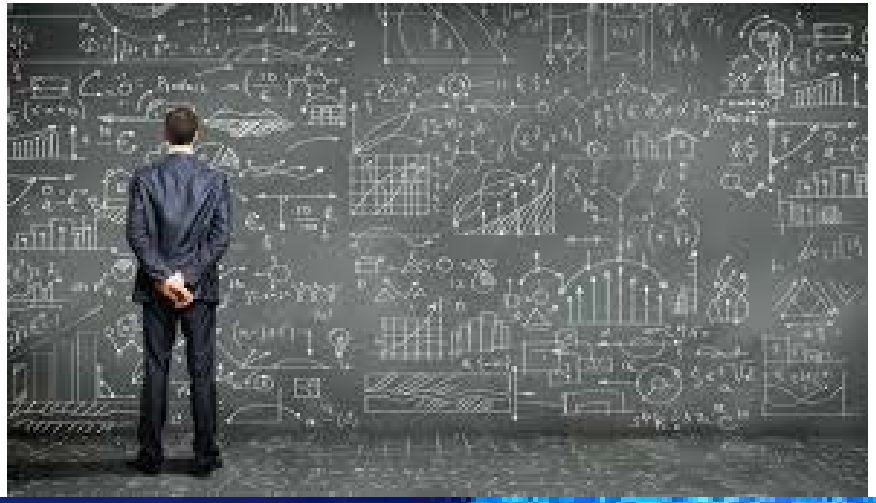
# SCIENCE, POLICY, AND POLITICS


19/02 2007-098 © John Ditchburn

# THE WORLD IS COMPLEX



# AN INDICATOR – SIMPLIFYING THE COMPLEX

- Developed to simplify and illustrate complex information, allowing decisionmakers and key audiences to understand the state of a measured entity.
- Although they are constructed to simplify reality, in many reports, they still offer a complex and confusing picture, not least by their sheer numbers (L Kohler, 2016)

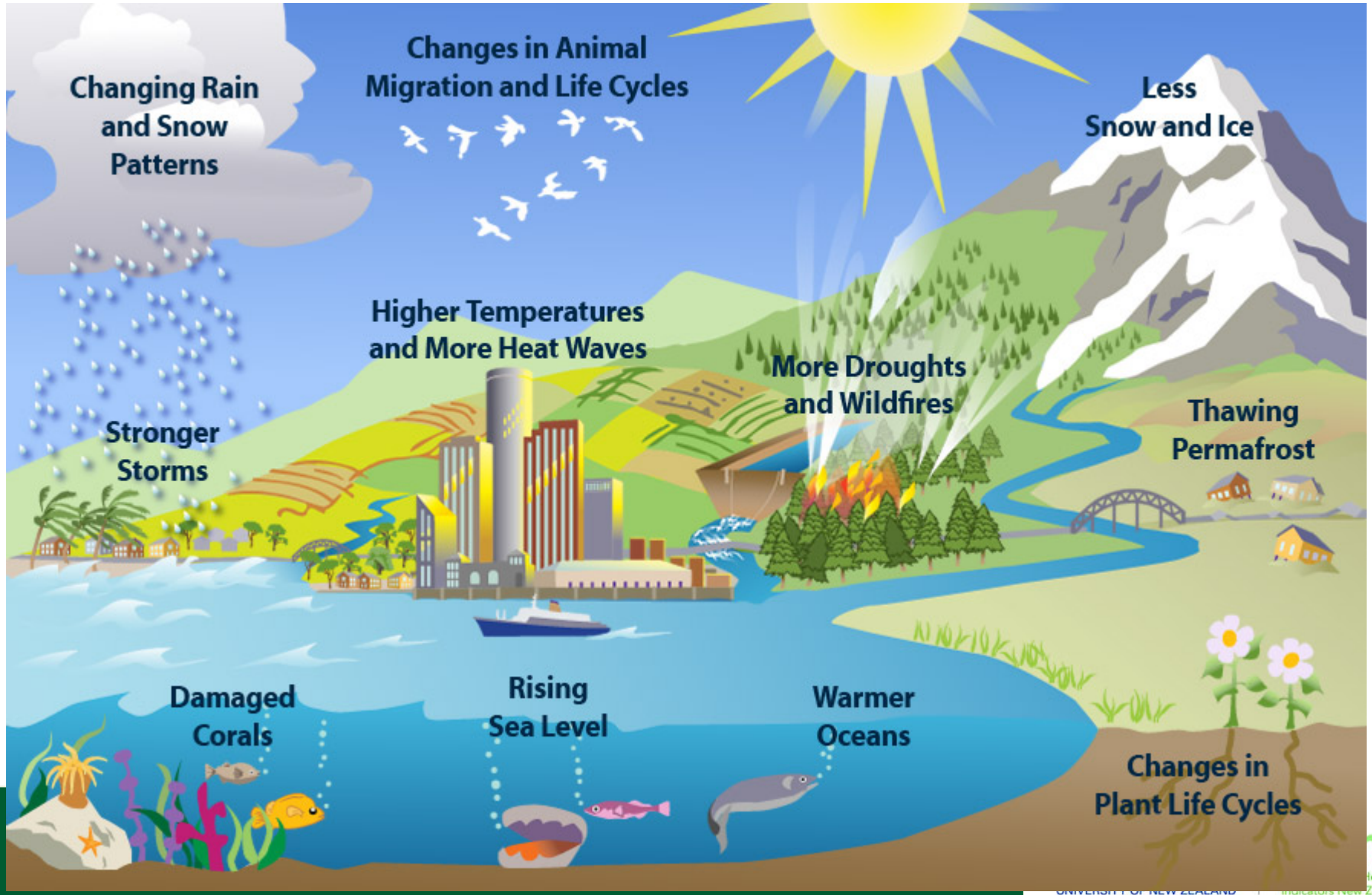
# FICTIONS AND FACTS INDICATORS


| FICTION | FACT |
|---|---|
| A ‘free-lunch’, easy | Good indicators are extremely difficult to define and compile |
| Value-free | Heavily biased by the perceptions and priorities of those who select them |
| An answer in themselves | Only provide (partial) evidence to help define the answer |
| Stand alone | Depend on the underpinning science and monitoring |
| An end in themselves | If used effectively, they have to be part of a real, evidence-based and participatory culture of decision-making |

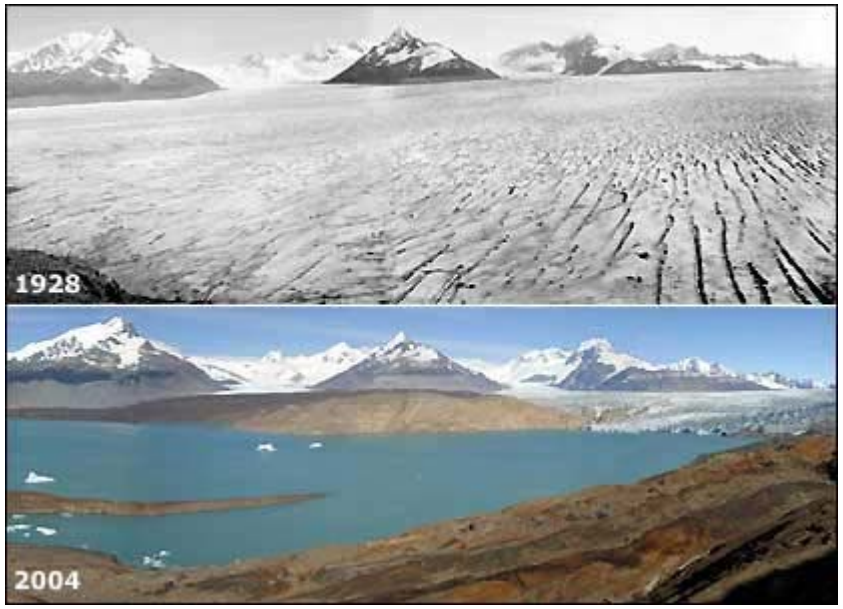
# FICTIONS AND FACTS INDICATORS


| FICTION | FACT |
|---|---|
| Indicators avoid the need to do lots of monitoring | Indicators rely on, and are determined by, what is monitored and how it is monitored |
| Indicators can be used for multiple different purposes | Indicators are question and context specific – even more so than the data on which they are built |
| Only a small number of core indicators are need to support policy | As many indicators are needed as questions are asked |
| Indicators are simple – and avoid having to understand difficult science | Indicators are only interpretable in relation to the science on which they are built |

# CLIMATE CHANGE INDICATORS



# CLIMATE CHANGE INDICATORS

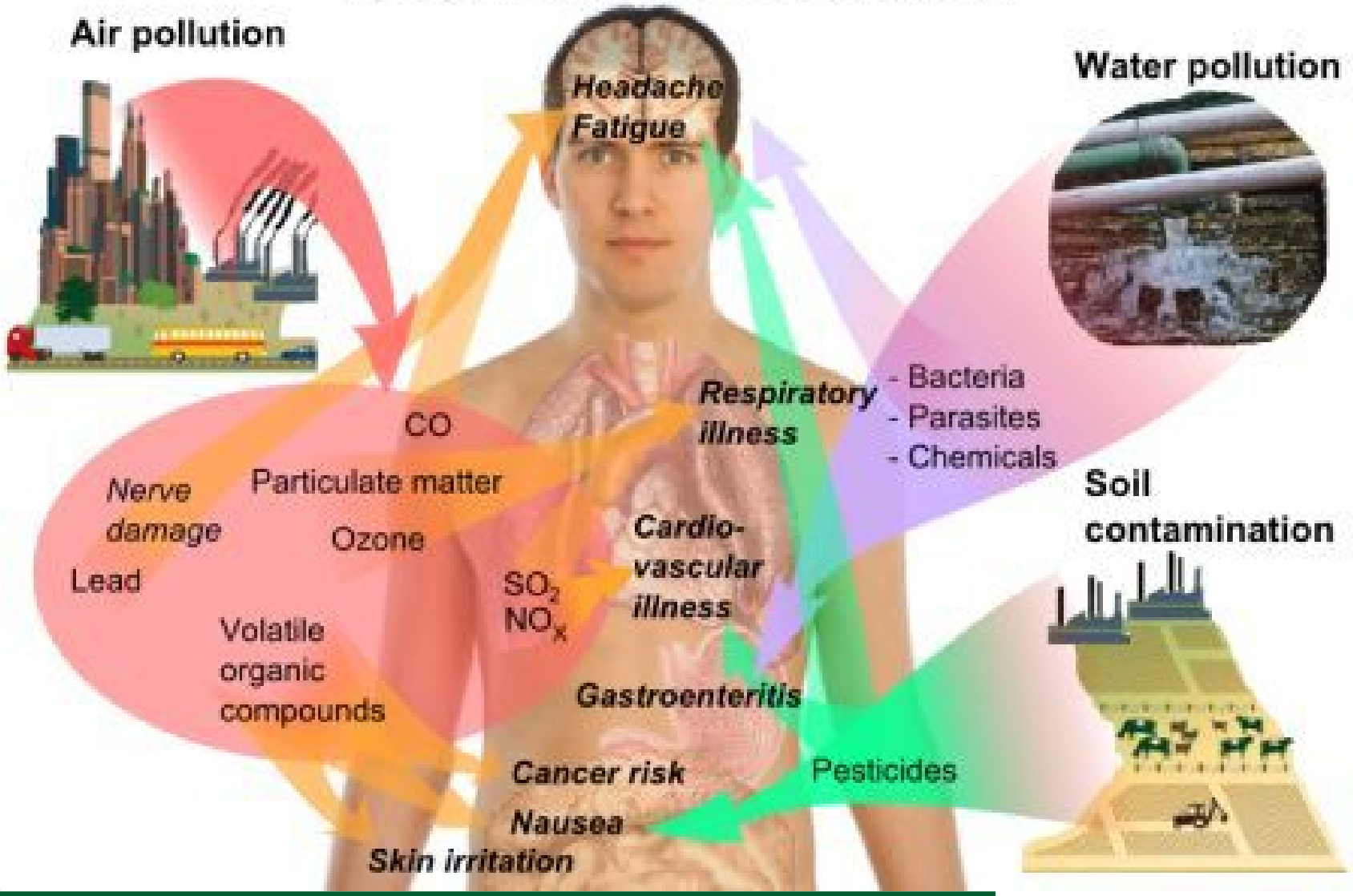




# MULTIPLE INDICATORS


- Most of the indicators are telling the same story, only in different forms.
- Reflect different thinking by different people
- Too many indicators will can cause analysis paralysis, contradictions and confusion and give unclear signals


# Health effects of pollution



# THE NEW ZEALAND EHI PROGRAMME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# NEW ZEALAND EHI PROGRAMME

MINISTRY OF HEALTH
MANATŪ HAUORA

- Started in 2010
- Funded by the Ministry of Health
- Other key stakeholder government agencies: Ministry for the Environment, Environmental Protection Authority
- Inherited a list of indicators based on the DPSEEA framework

Ministry for the Environment
Manatū Mō Te Taiao

Environmental Protection Authority
Te Mana Rauhī Taiao

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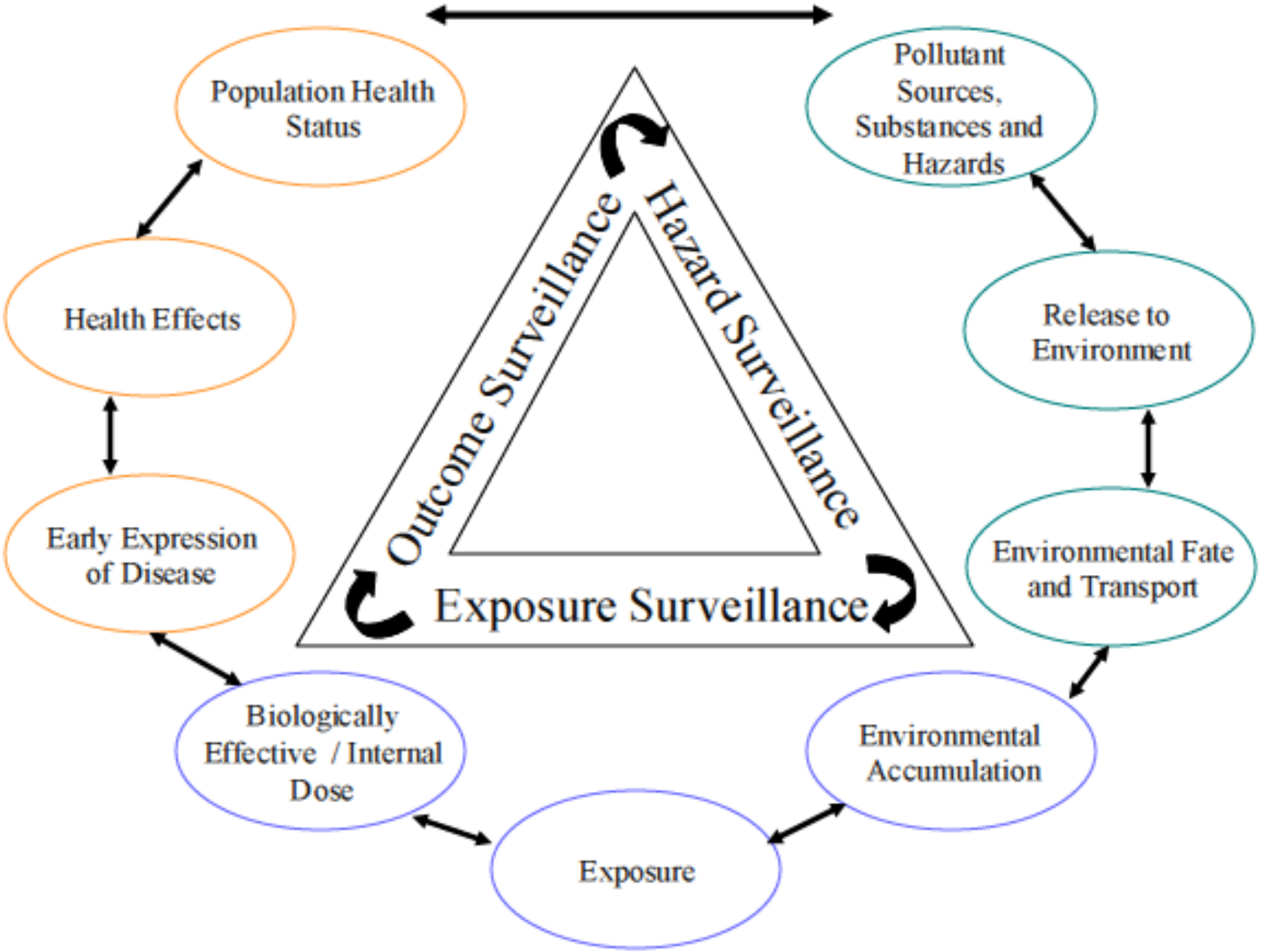
# PURPOSES OF THE EHI PROGRAMME

- Create the national hub for environmental health data and information
- Monitor trends in the state of the environment important for human health
- Monitor trends in health outcomes linked to environmental hazards and exposures
- Compare the environmental health status of geographic areas and population groups, with a focus on vulnerable populations

# PURPOSES OF THE EHI PROGRAMME

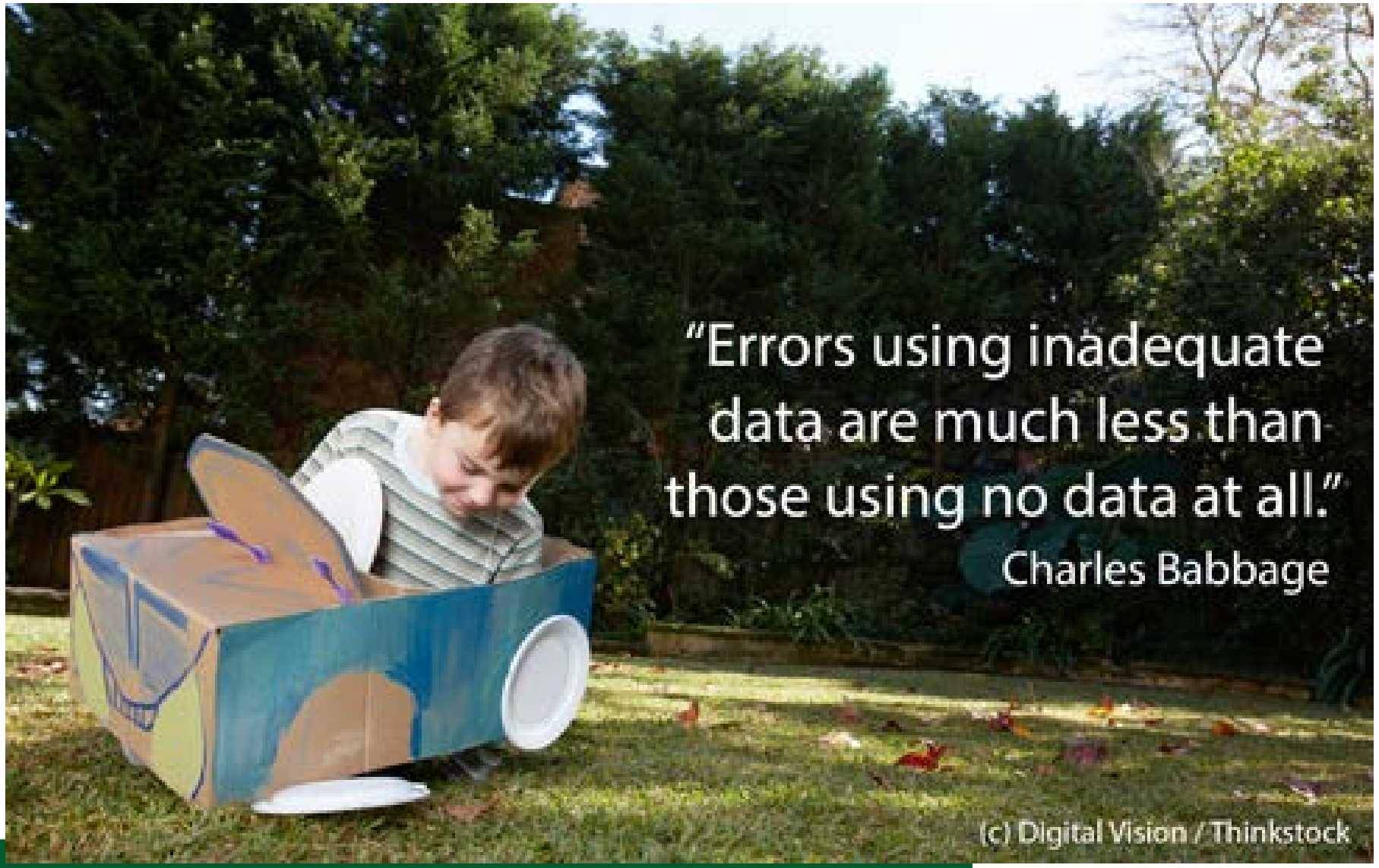
- Monitor the effectiveness of policies and other interventions on environmental health, and highlight good local practice
- Raise awareness about environmental health issues, as well as gaps and limitations in environmental health monitoring
- Help initiate further investigations into the links between the environment and health.

# BRIDGING THE CHASM



# CRITICAL ELEMENTS OF THE PROGRAMME


- Concept driven not data driven
- Not data collection
- Analysis and interpretation of existing data collected by other agencies
- Timely dissemination of information
- Application and use of the information
- Active stakeholder engagement and participation from key agencies
- End user focused, not IT driven

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# PUBLIC HEALTH FOCUS

- Our work has a strong public health focus, with a particular emphasis on the impacts of the environment on human health.

# WORKSTREAMS

- Environmental Health Indicator programme
- Hazardous Substances Surveillance System
- New Zealand Environmental Burden of Disease Study
- New Zealand Birth Defects Registry
- Supporting the environmental health sector with data, information, and technical and analytical advice and training

# THE EHI TEAM

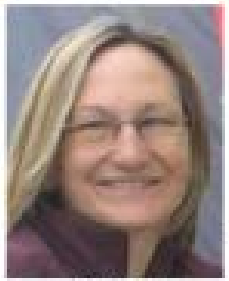

Barry


Deborah


Kylie


Kirstin


Anna


Caroline


Riz


Steve


Mathu


Helene


Fei


Sarah


Yuliya


Carolin


Rashmi


Rosemary

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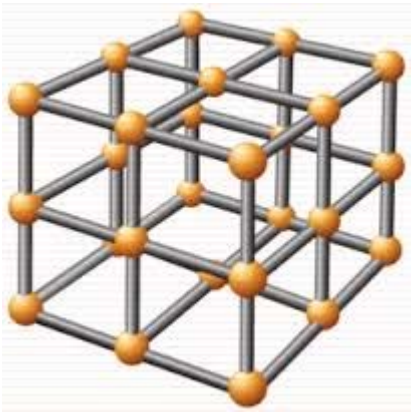
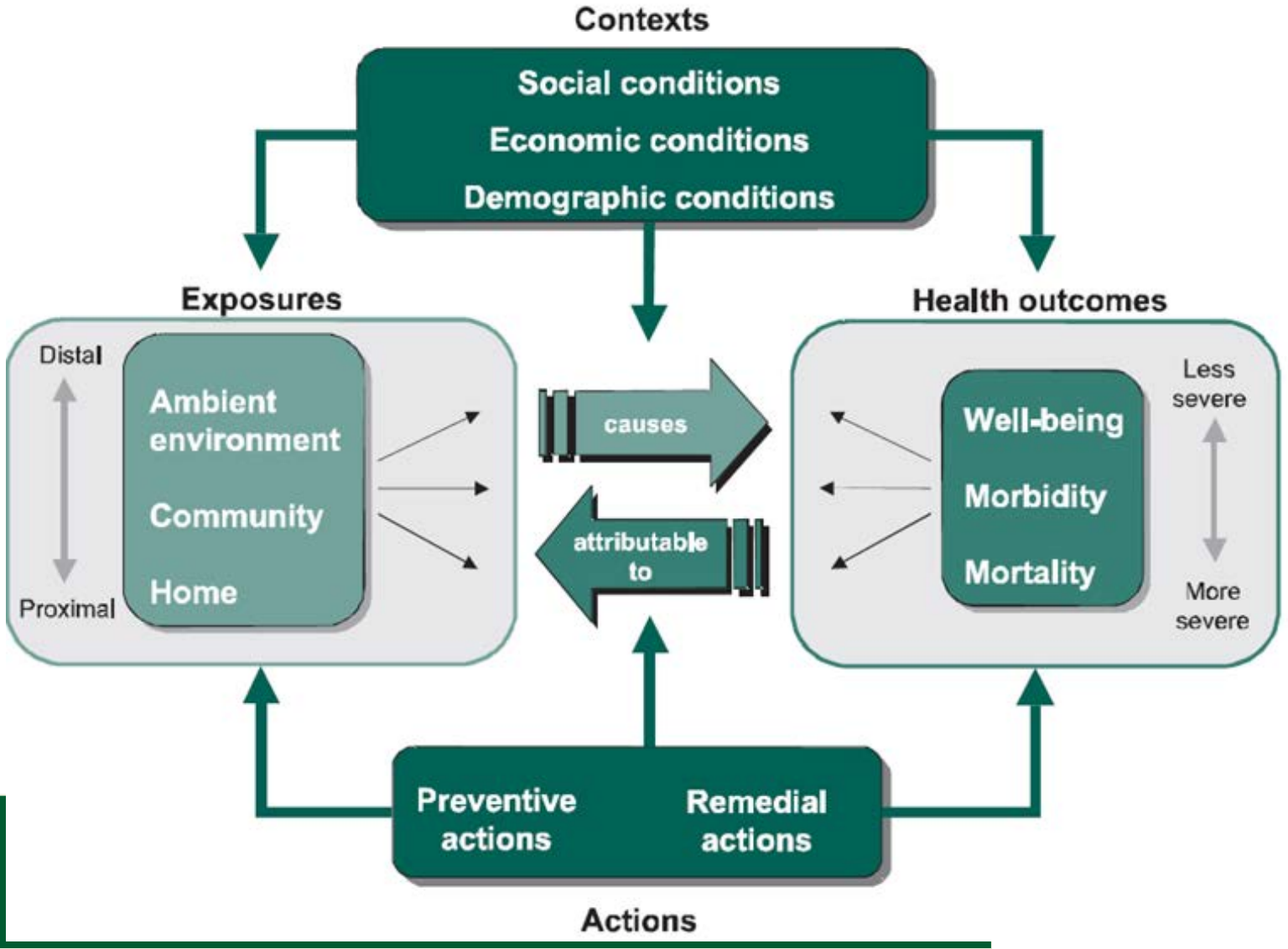
# MULTIPLE EXPOSURES MULTIPLE EFFECTS (MEME) FRAMEWORK



- Acknowledges the multiple links between environmental exposures and health effects, including the wider social, economic, and demographic conditions
- Flexible enough to be used to monitor a broad range of environmental health topics.

# MULTIPLE EXPOSURES MULTIPLE EFFECTS (MEME) FRAMEWORK (BRIGGS 2003)



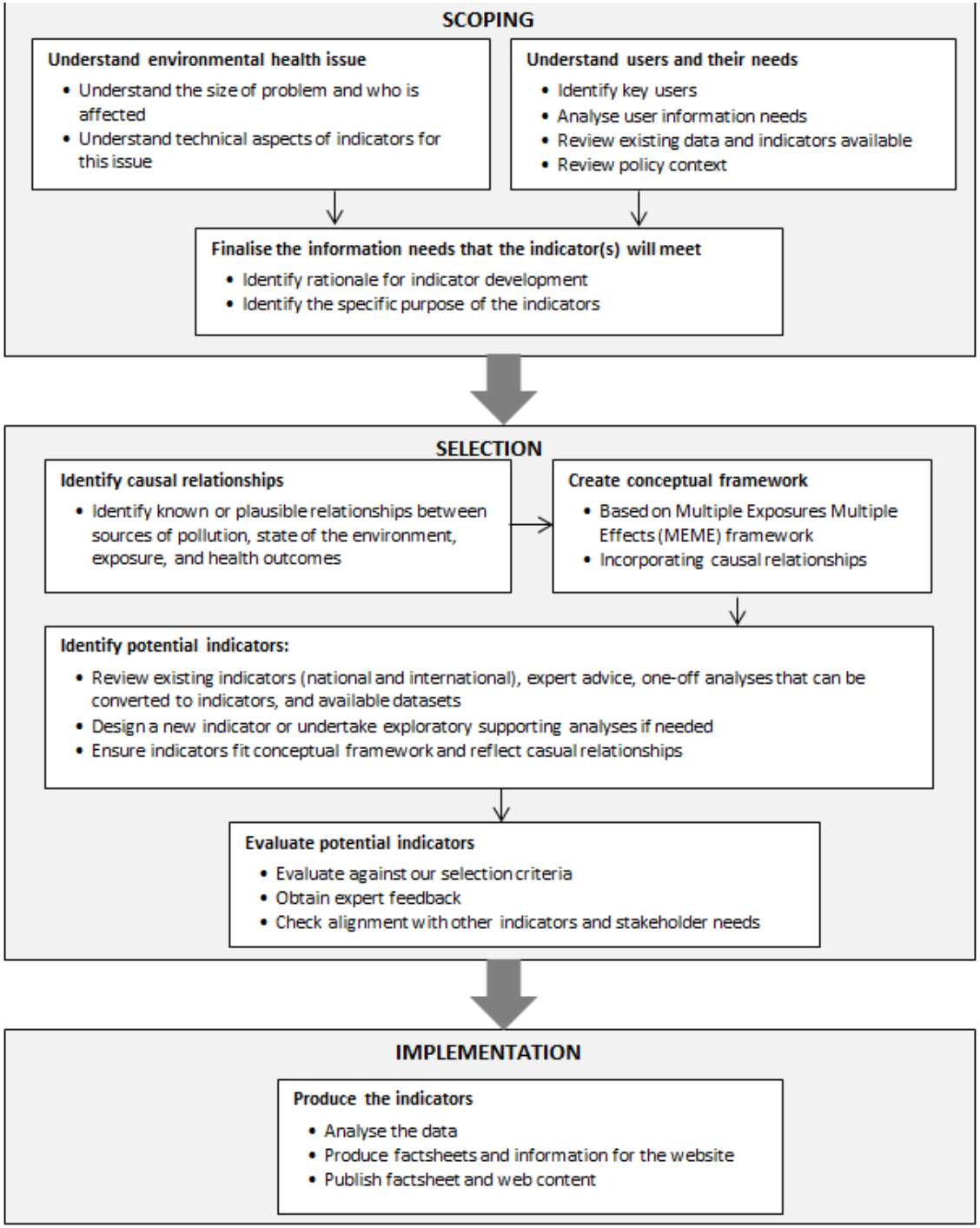
# MULTIPLE EXPOSURES MULTIPLE EFFECTS (MEME) FRAMEWORK

- Using this approach, each indicator generally describes one aspect of the environment–health relationship (such as exposures in the environment, or health outcomes).
- Underpinning the framework is a focus on social and demographic contexts, especially vulnerable populations.

# OUR INDICATORS

- Developed to be relevant and useful for a wide range of users, including:
  - government agencies, particularly your team and the wider MoH, MfE and Environmental Protection Authority
  - district health boards
  - public health units
  - local councils
  - environmental health professionals
  - the wider health, environment and related sectors
  - industry

# OUR PROCESS FOR DEVELOPING ENVIRONMENTAL HEALTH INDICATORS



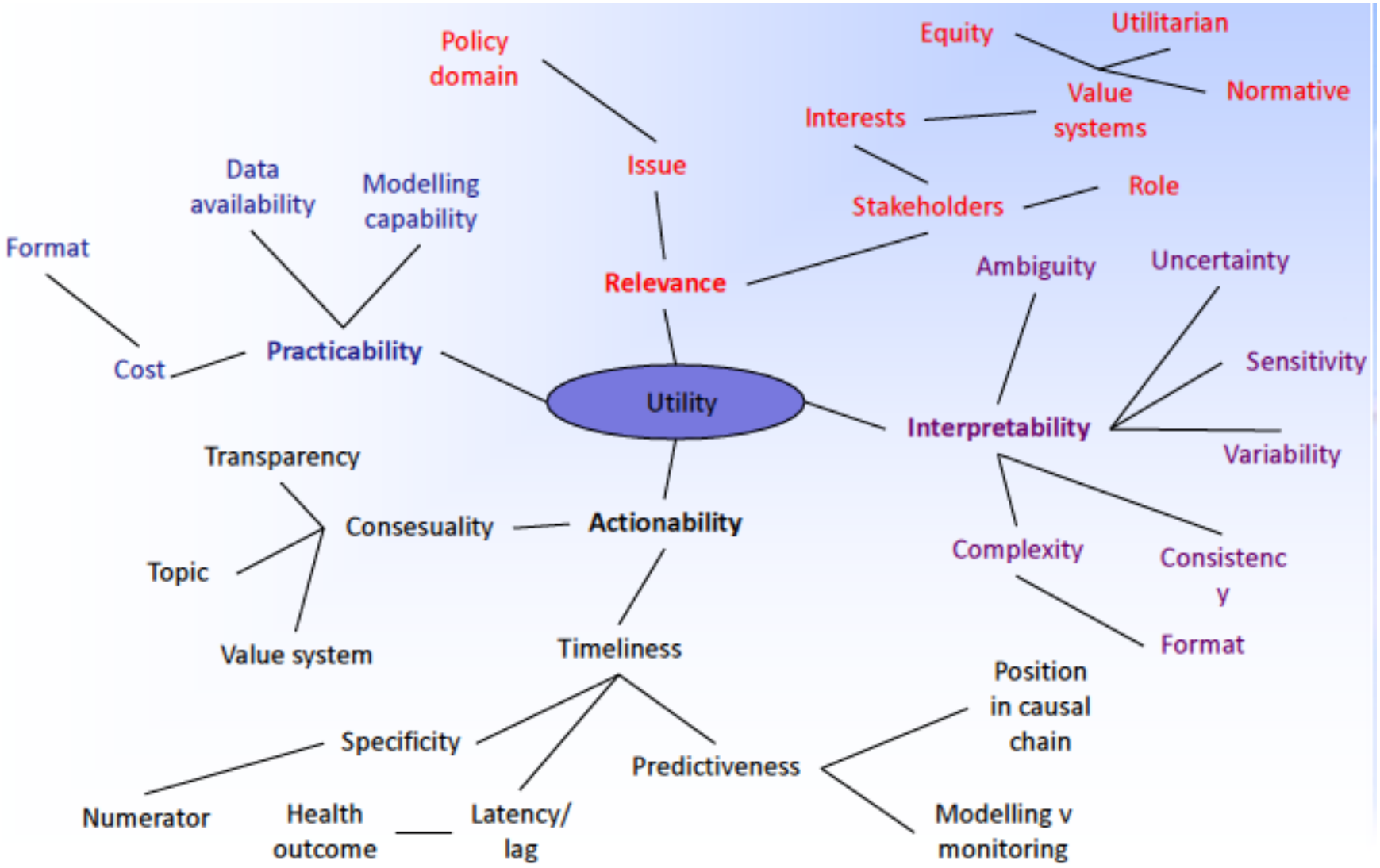
# OUR SELECTION CRITERIA FOR EHIS

| Criteria | Explanation |
|---|---|
| Available data | Indicators must have data that is easily and reliably extracted. |
| Scientifically valid | Indicators must have an established, scientifically sound link to the environmental health issue. |
| Sensitive | Indicators should respond relatively quickly and noticeably to changes, but not show false movements. |
| Consistent | Indicators should be consistent with those used in other indicator programmes, including internationally, to allow comparisons. |
| Comparable | Indicators should be consistent to allow comparisons over time. |
| Methodologically sound measurement | Indicator measurement needs to be methodologically sound. |
| Intelligible and easily interpreted | Indicators should be simple enough to be easily interpreted, and intuitive, in the sense that it is obvious what the indicators are measuring. |
| Able to be disaggregated | Indicators need to be able to be broken down into population subgroups or areas of particular interest, such as ethnic groups or regional areas. |
| Timely | Data needs to be collected and reported regularly and frequently, so that the indicator reflects current trends. |
| Public health impact | Indicators need to be about an environmental health issue that has a significant public health impact in New Zealand. This impact may be through affecting a large part of the population, affecting a vulnerable population, being relevant for Māori health, or having substantial policy relevance. |

# UTILITY

- Relevant
- Actionable
- Interpretable
- Practicable

# DETERMINANTS OF UTILITY

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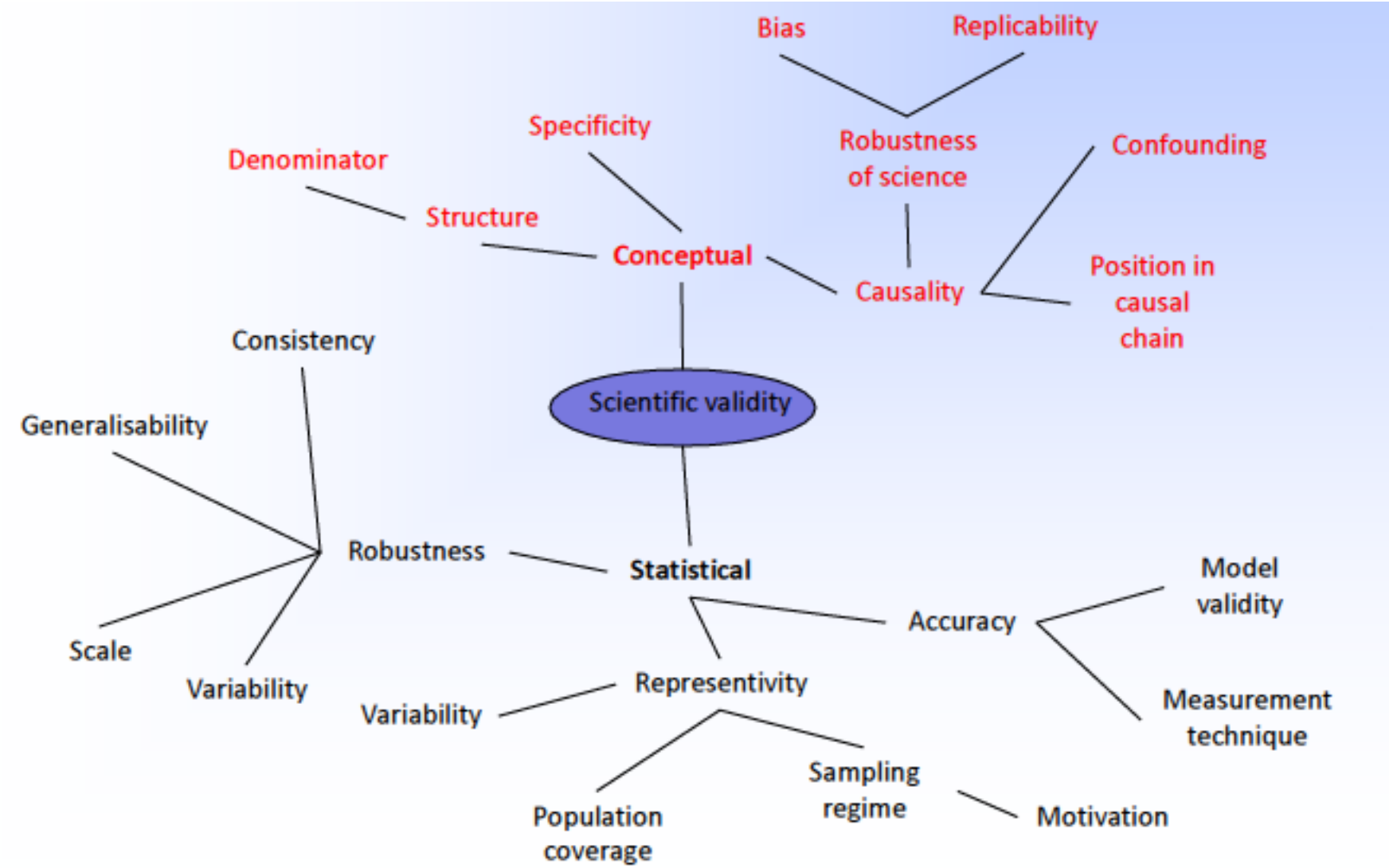
# SCIENTIFIC VALIDITY

- Conceptual
- Statistical

# DETERMINANTS OF SCIENTIFIC VALIDITY

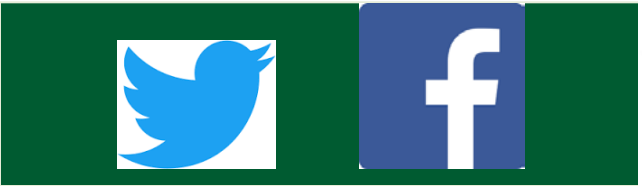


# REVIEW, REFINEMENT OF EXISTING INDICATORS

- At least once every 2–3 years, to ensure the indicators are up-to-date and are the best measure for a topic
- may refine existing indicators if we obtain new or improved data, methods, or evidence about an environmental health issue.
- For example, environmental burden of disease studies can help us to prioritise what exposures and health effects are the most important to monitor in the population.

# DISSEMINATION


- Factsheets
- Website
- CPHROnline
- Newsletter
- Twitter
- Facebook





# THE NZ EHI PROGRAMME – THANK YOU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