

Building systems that respond to
data and evidence

Session Objectives

- Discuss principles of evidence-based decision making
- Describe the structure and characteristics of data-driven systems
- *Describe frequently-used evaluation methods and the related data requirements*
- *Examine the major challenges in conducting effectiveness evaluations*

Evidence-based decision-making

- Evidence-based practice is about making decisions through the conscientious, explicit and judicious use of the best available evidence from multiple sources by

Asking:

Translating a practical issue or problem into an answerable question

Acquiring:

Systematically searching and retrieving the evidence

Appraising:

Critically judging the trustworthiness and relevance of the evidence

Aggregating:

Weighing and pulling together the evidence

Applying:

Incorporating the evidence in the decision-making process

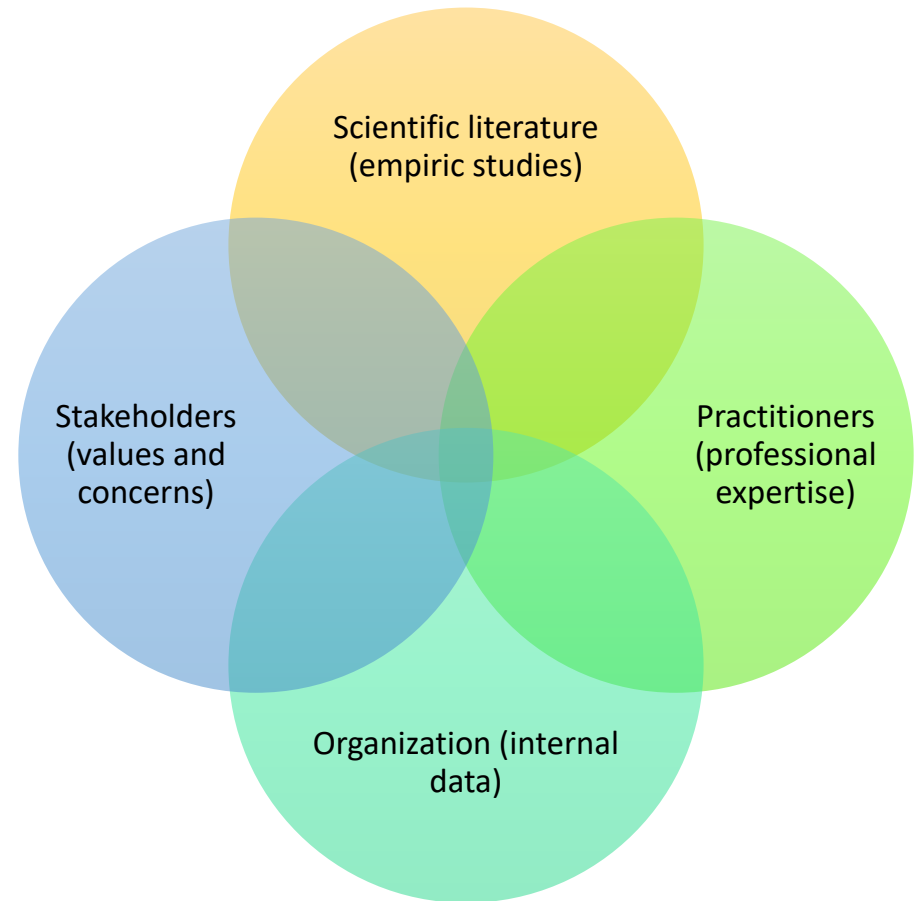
Assessing:

Evaluating the outcome of the decision taken

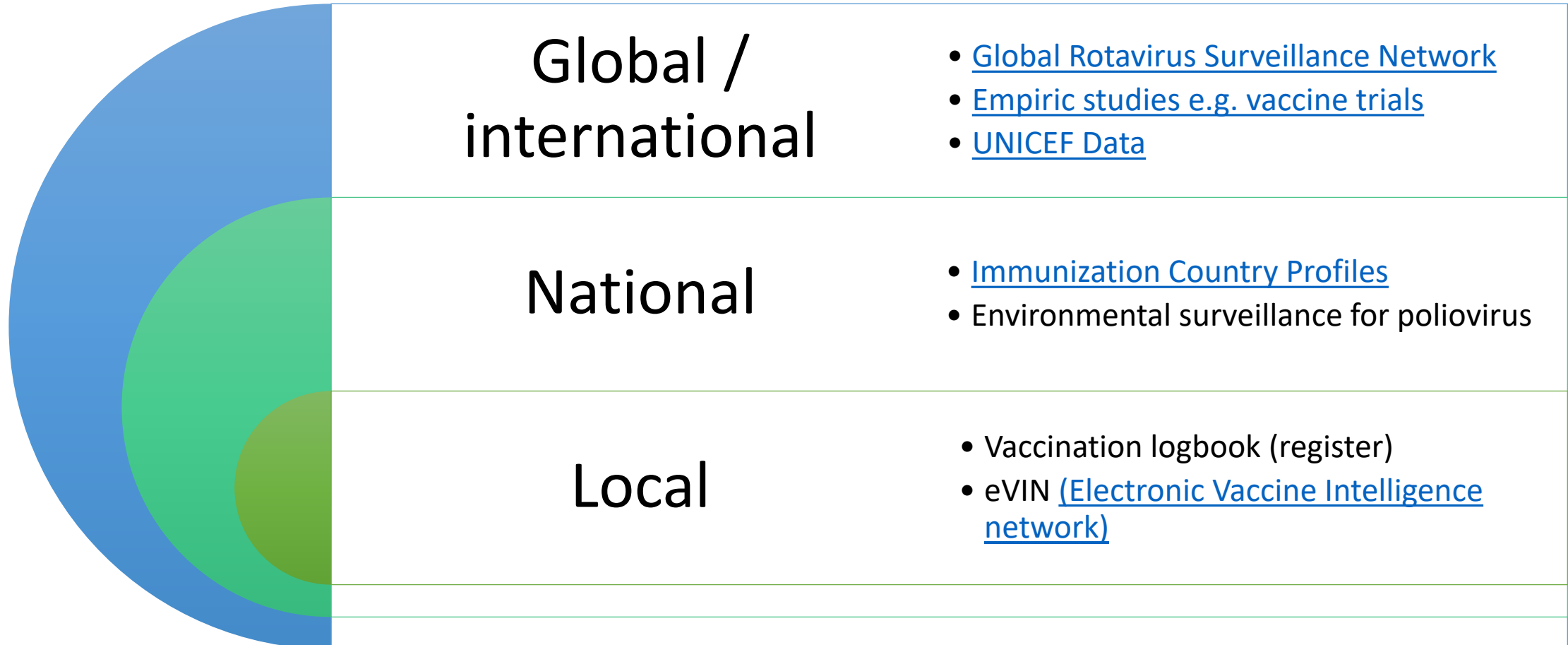
... to increase the likelihood of a favorable/desirable/required outcome.

Sources of evidence for decision-making

- Evidence based decision-making is a process for making decisions about a program, practice, or policy that is grounded in the **best available research evidence** and **informed by experiential evidence from the field** and **relevant contextual evidence**.



Levels of data to inform decision-making



Stages of evidence-based decision-making

1. Gathering evidence

- Seek out best available evidence
- Collect contextual information on factors important for the decision
- Draw upon the expertise and knowledge of stakeholders
- Confirm that all the information used as evidence is observable, credible, verifiable and replicable

2. Interpreting evidence

- Consider the strength of the research evidence
- Explore the experience, preferences, and values of local stakeholders
- Assess the fit of the strategies in light of the context and population affected by the decision

3. Applying evidence

- Consider and weigh all three types of evidence to provide the best opportunity for its application

Managing a patient...



- What are the goals of treatment
 - Increasing lifespan?
 - Improving quality of life?
 - Reducing pain and suffering?
- Gather data to address the goals
 - e.g. limiting blood tests in hospice care
- Establishing data standards
 - What are the vital signs?
- Getting the most out of the data (reducing expense, risk, harm)
 - Considering whether you need an x-ray or a CAT scan
- Reference to data at each decision point
 - Patient rounds – asking the patient how they feel, discuss the condition with the nursing staff, review the results of tests to decide course of action

Clarity of purpose

- The most effective approach to building a data-driven system usually starts, not with the data, but with identifying the “goals of the treatment”
- Such “hypothesis-led” data usage will generate faster outcomes and roots models in practical data relationships that are more broadly understood by managers and users
- Each step in the usage of data should refer back to the original purpose.

Data addressing the purpose

- Many initial implementations of data and analytics fail because they aren't in sync with day-to-day processes and decision-making needs.
- The design of the data system need to align with the types of judgments that managers make to align their actions with broader goals.
- Conversations with frontline managers will ensure that analytics and tools complement existing decision processes, in order to manage a range of trade-offs effectively.

Choose the right data

- The volume of information is growing rapidly, while opportunities to expand insights by data usage are accelerating. The ability to see what was previously invisible improves operations and strategy.
- Often, data needed to tackle problems already exists, but managers simply don't know how they can use this information to make key decisions. Decision-makers, for instance, might not focus on the potential value of the daily operations data they possess.
- Encourage a more comprehensive look at data by being specific about the problems and opportunities that need to be addressed.

Source data creatively

- Managers also need to get creative about the potential of external and new sources of data.
- Social media generates terabytes of nontraditional, unstructured data in the form of conversations, photos, and video.
- Add to that the streams of data flowing in from sensors, monitored processes, and external sources ranging from local demographics to weather forecasts.
- One way to prompt broader thinking about potential data is to ask, “What decisions could we make if we had all the information we need?”

Getting the necessary IT support

- Pre-existing IT structures may hinder new types of data sourcing, storage, and analysis. Existing IT architectures may prevent the integration of siloed information, and managing unstructured data often remains beyond traditional IT capabilities.
- Fully resolving these issues often takes years. However, leaders can address short-term big-data needs by working with IT managers to prioritize requirements.
- This means quickly identifying and connecting the most important data for use and then mounting a cleanup operation to synchronize and merge overlapping data and to work around missing information.

The risks of data usage

- Remember, too, that any data usage exercise has inherent risk.
- Although advanced data methods indisputably make for better models, experts sometimes design systems that are too complex to be practical and may exhaust most organizations' capabilities.
- We should repeatedly ask, “What’s the least complex model that would improve our performance?”

The risks of data usage

- Managers may not understand or trust data-based models and, consequently, won't use them.
- Such problems often arise because of a mismatch between an organization's existing culture and capabilities and emerging tactics to exploit data successfully.
- The new approaches either don't align with how workers actually arrive at decisions or fail to provide a clear blueprint for realizing goals.
- Tools seem to be designed for data experts rather than for people on the front lines, and few managers find the models engaging enough to champion their use—a key failing if you want the data methods to permeate the organization.

Develop capabilities to exploit data

- Even with simple and usable models, most organizations will need to upgrade their analytical skills and literacy.
- To make analytics part of the fabric of daily operations, managers must view it as central to solving problems and identifying opportunities.
- Efforts will vary, depending on a company's goals and desired time line.
- Adjusting cultures and mind-sets typically requires a multifaceted approach that includes training, role modeling by leaders, and incentives and metrics to reinforce behavior.
- Adult learners, for instance, often benefit from a “field and forum” approach, in which they participate in real-world, analytics-based workplace decisions that allow them to learn by doing.