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Identifying and managing bias in data analysis and interpretation

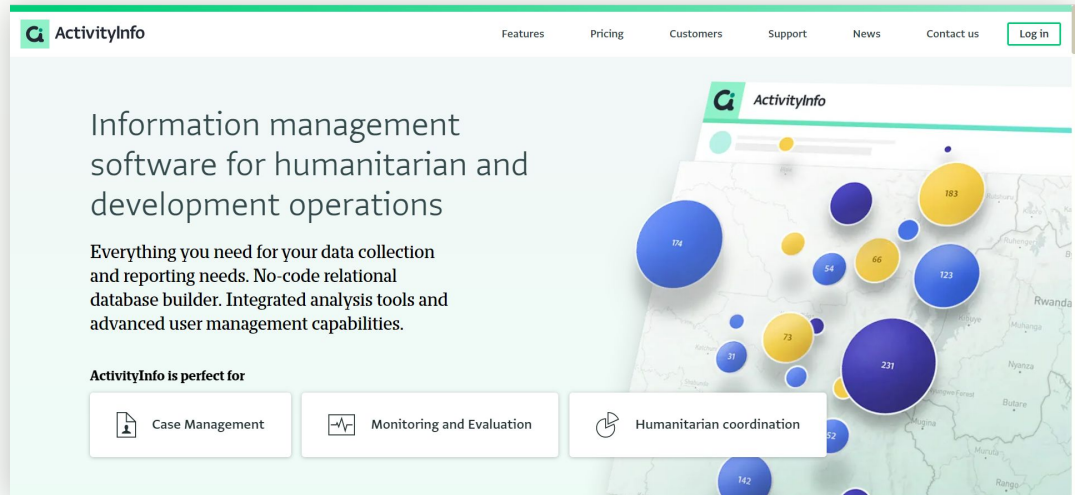**Starting shortly, Please wait!**

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Introductions

Presented by the ActivityInfo Team

All in one information management software for humanitarian and development operations

○ Track activities, outcomes
○ Beneficiary management
○ Surveys
○ Work offline/online

Poll

- Have you encountered or dealt with issues related to bias in your M&E practice?
  - Yes
  - No

- What challenges do you anticipate in addressing bias in M&E practices?
  - Lack of Awareness
  - Limited Resources
  - Resistance to Change
  - Complex Methodologies
  - Inadequate Training
  - Data Collection Constraints
  - Stakeholder Influences
  - Time Constraints
  - Insufficient Tools/Technology
  - Cultural Sensitivity Issues

Outline

01 Understanding Bias in M&E

02 Types of Biases

03 Managing and Mitigating Bias

04 Q&A and wrap-up

01
Understanding Bias in M&E

Understanding Bias in M&E

Explanation of bias in the context of Monitoring and Evaluation

"*The cause is hidden, the result is known*"
(Ovid's Methamorphoses ,Book IV, 287) (Translated from the original Latin Maxim: "Causa latet, vis est notissima")

- This idea captures our human curiosity and struggle to understand why things happen the way they do.
  - One of such expressions of curiosity is in Impact evaluation–a way to figure out what works, what doesn't, and why.
- Though impact evaluation helps us understand if a program is really making a difference,they are prone to different biases.

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Understanding Bias in M&E

Explanation of bias in the context of Monitoring and Evaluation.

"*...Bias is an inaccurate representation that produces systematic error in a research finding. Bias may result in overestimating or underestimating characteristics or trends. It may result from incomplete information or invalid data collection methods and may be intentional or unintentional*".

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Understanding Bias in M&E

Explanation of bias in the context of Monitoring and Evaluation.
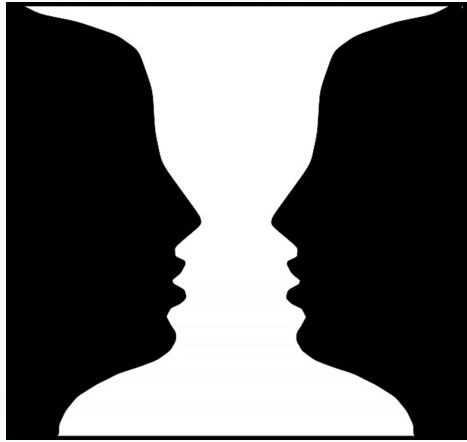
Understanding Bias in M&E

Explanation of bias in the context of Monitoring and Evaluation.

- **Evaluation Methods:**
  a. Most evaluations rely on both quantitative and qualitative evidence, often drawn from observational data, to assess interventions. However, these data types are susceptible to well-known biases.
  b. While Randomized Control Trials (RCTs) are considered a gold standard to address bias, they are not immune to biases. Concerns have been raised about their limitations and applicability to various interventions.

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Understanding Bias in M&E

An Overview of Challenges in Qualitative and Quantitative Evaluations

In essence, both qualitative and quantitative evaluations face inherent challenges influenced by biases and external factors.

- **Cognitive and Behavioral Biases:**
    i. Both qualitative and quantitative evaluations, including Randomized Control Trials (RCTs), are susceptible to cognitive and behavioral biases.
    ii. These biases can influence how researchers perceive, interpret, and analyze data.
- **External Pressures:**
    i. Evaluations are vulnerable to external pressures from political, social, and economic factors.
    ii. Qualitative evaluation research, often exploratory and formative, is particularly sensitive to these pressures.
- **Positionalities of Researchers:**
    i. Evaluation researchers bring their perspectives, known as positionalities, shaping what they observe and seek statistical support for.
    ii. These positions influence the framing of research questions and the interpretation of findings.

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Understanding Bias in M&E

An Overview of Challenges in Qualitative and Quantitative Evaluations

Concerns about Randomized Control Trials (RCTs):

- *Gold Standard:* Randomized Controlled Trials (RCTs) are considered the gold standard. They involve randomly assigning individuals to either the treatment group (receives the program) or the control group (does not receive the program).
- *Prospective:* RCTs are planned in advance of the intervention, with participants selected randomly, aiming to create a perfect counterfactual (a situation without the program) free from bias.
- *Challenges:* Despite being the gold standard, RCTs face challenges. Ethical concerns can make randomization difficult, especially when deciding who gets a potentially beneficial treatment. Political issues may arise, and the scope of the intervention may be too broad for a suitable counterfactual. Achieving true randomization can be challenging, and RCTs may lack external validity, meaning their results may not be easily generalized to a larger population.

Understanding Bias in M&E

An Overview of Challenges in Qualitative and Quantitative Evaluations

Concerns about Non-Experimental Designs:

- *Alternatives:* Non-experimental methods are alternatives to RCTs. They aim to generate a control group that resembles the treatment group based on observable characteristics but without random assignment.
- *Prospective or Retrospective:* Non-randomized designs can be either prospective (like an RCT, where treatment and control groups are selected before the intervention) or retrospective (identifying a control group after the intervention has occurred).
- *Methods:* Non-random methods use econometric methodologies like matching and double difference to create a control group that resembles the treatment group. Control variables are included to account for differences between the treatment and control groups.
- *Advantages:* Non-experimental designs are often more practical, faster, and cost-effective compared to RCTs. They can be implemented after a program has started, and ethical and political considerations are usually less critical since the intervention has already taken place.
- *Disadvantage:* However, non-randomized studies are statistically less robust and may be prone to biases. The challenge lies in overcoming these biases to produce reliable results.

![ActivityInfo logo] **ActivityInfo**

02
Types of Biases

Understanding Bias in M&E

Types of Bias

Empirical	Forms of cognitive bias such as sensitivity to patterns, attribution error, self-importance, halo effect, selection, placement, and statistical biases.
Researcher	Researcher or experimenter allegiance, conservative bias, standpoint or positionality, similar person bias.
Methodological	Availability bias, diplomatic bias, courtesy bias, exposure bias, bias caused through multiple mediation and distance from data generation
Contextual	Friendship bias, pro-project bias.

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Understanding Bias in M&E

Types of Bias

Empirical Biases

- Pattern Recognition Bias:
  - In a humanitarian context, an organization might perceive a short-term positive change in a community's well-being and assume a lasting pattern, potentially overlooking underlying issues.
- Availability Bias:
  - After a high-profile disaster, like a hurricane, people might overestimate the likelihood of such events, leading to an overemphasis on disaster response rather than long-term community resilience.
- Attribution Bias:
  - When assessing the impact of a humanitarian intervention, attributing positive changes solely to internal factors (e.g., the organization's efforts) without considering external circumstances.

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Understanding Bias in M&E

Types of Bias

Empirical Biases

Pervasive biases include selection bias (differences between participants and non-participants) and placement bias (location-specific interventions).

- **Selection Bias:** The challenge in observational data methods where individuals self-select into different states (e.g., treated vs. not treated), leading to biased estimates of intervention effects.
- **Program Placement Bias:** A bias in impact evaluation arising from comparing areas with the intervention to areas without the intervention, where the targeted nature of interventions often leads to dissimilar characteristics between the two areas.
- **Attrition Bias:** A type of selection bias in impact evaluation resulting from the dropout of participants, impacting both internal and external validity.
- **Social Desirability Bias:** A form of response bias where survey respondents provide inaccurate or distorted answers due to a perceived social pressure to present themselves favorably.

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Understanding Bias in M&E

Types of Bias

Researcher Biases:

- Allegiance Bias:
  - Researchers, loyal to a specific humanitarian approach, might dismiss alternative methods, potentially hindering the discovery of more effective strategies.
- Conservative Bias:
  - A reluctance to embrace new, innovative approaches in humanitarian aid, sticking to traditional methods despite evidence supporting more efficient interventions.
- Perspective/Positionality:
  - Researchers' backgrounds and perspectives shaping their interpretation of data from a humanitarian project, influencing how success or failure is defined.
- Response Biases:
  - Neglecting to consider biases in how disaster survivors respond to assessments, potentially leading to incomplete or skewed data in humanitarian evaluations.

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Understanding Bias in M&E

Types of Bias

Methodological Biases in Humanitarian Evaluation:

- **Courtesy Bias:** In a humanitarian context, people might provide positive feedback to evaluators, especially when associated with an NGO or relief agency, leading to an overly optimistic portrayal of the intervention's impact.
- **Diplomatic Bias:** Evaluators, to maintain a positive relationship with the community or local authorities, may avoid probing deeper or challenging inconsistencies in the data, potentially missing critical issues.
- **Exposure Bias:** Evaluations heavily influenced by the exposure of researchers to certain aspects of a humanitarian project, potentially neglecting less visible but equally significant components.
- **Friendship Bias:** Bias arising when the evaluator has a personal connection or friendship with individuals in the community, potentially impacting the objectivity of the assessment.

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Understanding Bias in M&E

Types of Bias

Methodological and Contextual Biases in Humanitarian Evaluation:

- **Pro-Project Bias:** Evaluators associated with a specific project or initiative may inadvertently focus on highlighting positive aspects, overlooking or downplaying challenges and failures.
- **Interpretation and Translation Bias:** In qualitative research, biases may be introduced during interpretation and translation, affecting the accuracy of data and potentially misrepresenting respondents' perspectives.
- **Note-Taking Bias:** Variances in the quality of note-taking during interviews may lead to incomplete or biased information, influencing the subsequent qualitative analysis.
- **Embodied Knowledge Bias:** Difficulty in capturing embodied knowledge during interviews can result in a limited understanding of the lived experiences of individuals in humanitarian contexts.

Understanding Bias in M&E

How Does Bias affect Data analysis and Interpretation
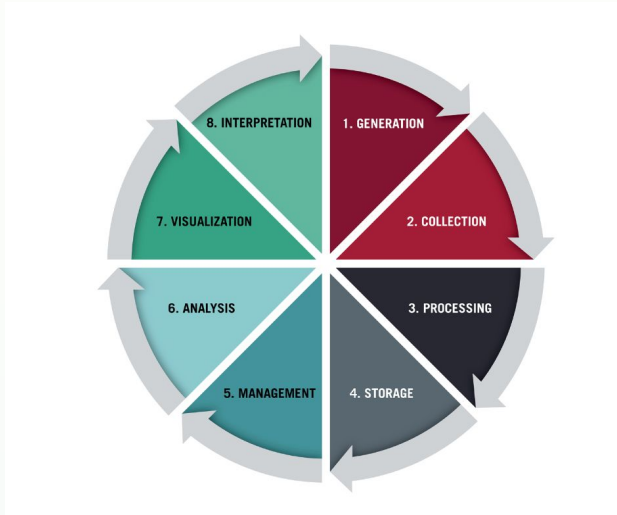
Expressions of biases

Data collection
Primarily empirical, researcher, methodological

Data analysis
Primarily affected by empirical bias

Data interpretation
Primarily empirical, researcher, methodological

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Understanding Bias in M&E

How Does Bias affect Data analysis and Interpretation

- ○ Evaluations typically examine whether interventions have a measurable beneficial effect.
- ○ This involves formulating hypotheses: a null hypothesis assuming no effect and an alternate hypothesis suggesting a beneficial effect.

Biases lead to Errors:

- ○ Type 1 Error: Occurs when the null hypothesis is true but is incorrectly rejected (false positive).
- ○ Type 2 Error: Happens when the alternate hypothesis is true, but the null hypothesis is not rejected (false negative).
- ○ There's a prevailing pro-action bias in statistical practices.
- ○ This bias leans toward finding positive results rather than objectively discussing limitations and uncertainties.

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Understanding Bias in M&E

How Does Bias affect Data analysis and Interpretation

- ○ **Non-Representative Samples:**
  - ■ Biased estimations and potential implementation of erroneous hypotheses or ineffective actions based on inaccurate data.
- ○ **Undercoverage Bias:**
  - ■ Limitation in understanding the intervention's impact, especially on marginalized or vulnerable populations.
- ○ **Selection Bias:**
  - ■ Skewing of evaluation results, leading to incorrect conclusions about the characteristics and experiences of the evaluated group.
- ○ **Bias Due to Self-Selection:**
  - ■ Biased conclusions about the population due to voluntary participation, impacting representativeness.
- ○ **Voluntary Response Bias:**
  - ■ Distorted comprehension of intervention effects as the perspectives of non-responders are not recorded.

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Understanding Bias in M&E

Example

Selection Bias

In humanitarian action, without proper targeting, it is possible that the most privileged will access the relief programme first. When we do not account for other covariates, such us education or income. This will affect how effective the relief programme for this group is.

03
Managing and Mitigating Biases

Managing and Mitigating Bias in M&E

General Strategies to Mitigating Bias

Acknowledgment and Declarations:

- **Encourage** the acknowledgment of bias likelihood.
- **Promote declarations of interests**, encompassing a broad spectrum.
- **Address** systemic pressures encouraging bias.

Systematic Approach:

- **Emphasize** being systematic, transparent, and reflexive.
- **Publish** a clear research plan outlining data nature, sources, and design.
- **Specify** instruments and protocols for fieldwork and analysis to avoid "fishing trips."

Transparency in Qualitative Research:

- **Address** challenges in qualitative research through transparency.
  a. Provide full methodological accounts, including analysis details and archive data to enable potential replication.

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Managing and Mitigating Bias in M&E

Specific Mitigation Strategies

Program Placement Bias

- **Recognize** that targeted interventions may lead to dissimilarities between participant and non-participant areas.
- **Highlight** the importance of randomization in reducing bias in program placement.
- **Model** program placement, similar to self-selection bias
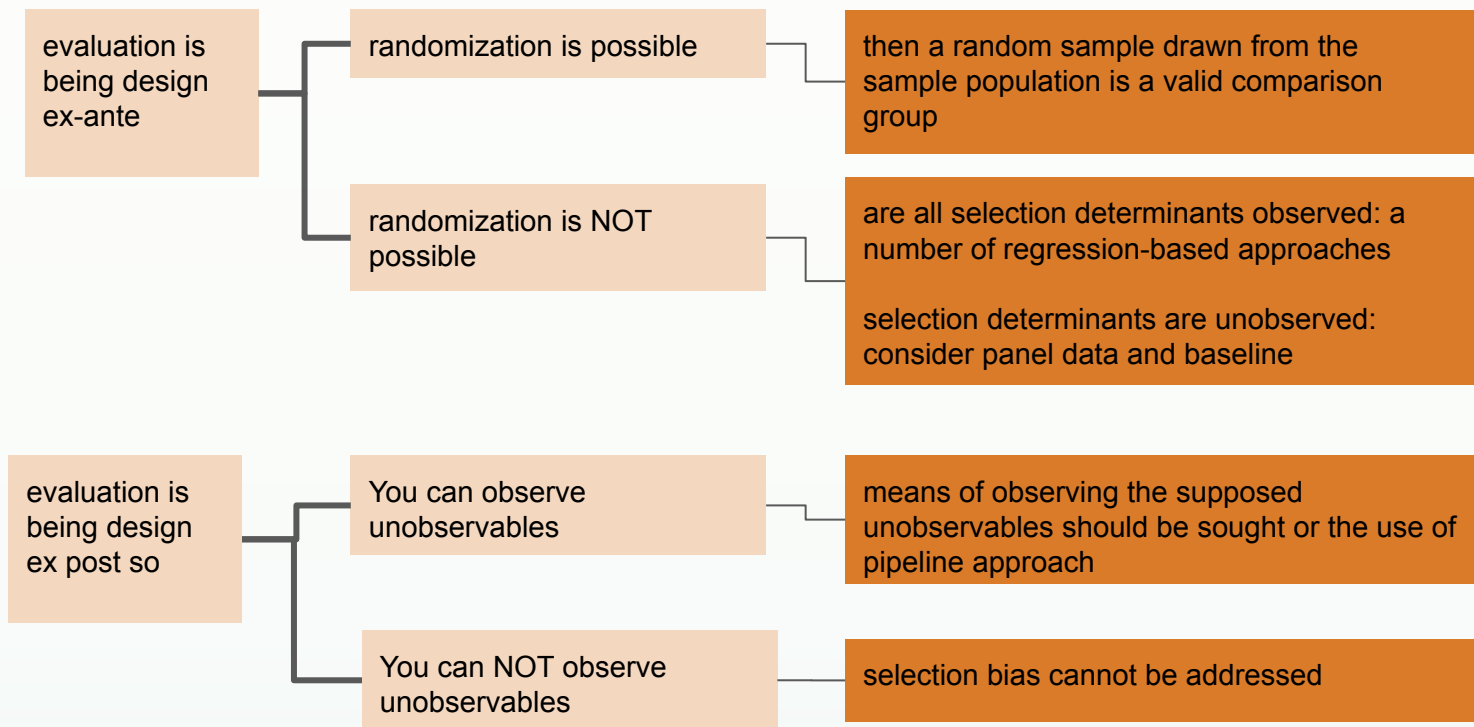
Selection Bias

- **Implement randomized settings** with a control group to counter self-selection bias.
- In non-randomized settings, **model the selection process** to generate an unbiased estimate.
- **Acknowledge difficulties** in finding a comparable non-participant group, especially in interventions like microfinance.
- **Be cautious in impact evaluations** comparing participants with non-participants to avoid overestimation or underestimation of program impact.

Attrition Bias

- **Track dropouts**, though it's rarely practical due to cost and time constraints.
- **Report the level of attrition** and **compare** dropouts with program participants based on observable characteristics.
- **Recognize** that non-random dropouts can influence the impact evaluation, leading to over or underestimation of intervention impact.

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Managing and Mitigating Bias in M&E

Decision Tree for Selecting Evaluation Design to Deal with Selection Bias

evaluation is being design ex-ante

randomization is possible → then a random sample drawn from the sample population is a valid comparison group

randomization is NOT possible → are all selection determinants observed: a number of regression-based approaches

selection determinants are unobserved: consider panel data and baseline

evaluation is being design ex post so

You can observe unobservables → means of observing the supposed unobservables should be sought or the use of pipeline approach

You can NOT observe unobservables → selection bias cannot be addressed

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Managing and Mitigating Bias in M&E

Specific Mitigation Strategies

Social Desirability Bias

- **Recognize incentives to lie**, particularly in sensitive topics, leading to over-reporting 'good' behavior or under-reporting undesirable behavior.
- **Emphasize the discrepancy** between respondents' actions and survey responses, highlighting the impact on questionnaire and survey validity.
- **Investigate social desirability bias in various contexts**, such as voter turnout reports or self-reporting of loan use in microfinance.

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Managing and Mitigating Bias in M&E

Specific Mitigation Strategies

Cognitive bias

- Generate awareness by acknowledging that no one can escape bias. The increased awareness can eliminate our biases.
- Provision of structured sessions, where powerful people do not dominate discussion can provide a equal platform of discussion, thus leading to bias mitigation.
- Having a range of people with different perspectives that can question group thinking and balance out dominating voices can eliminate biases.

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Managing and Mitigating Bias in M&E

Mitigation Bias using ITC4D [ActivityInfo]

The use of ICT4D enables real-time use of information via data visualization and enhanced analytics. Thus leading to:

- Increased transparency: **Reports sharing** with relevant stakeholders can lead to timely feedback on their behalf
- Identification of similarities and difference **across participants** and **non participants**
- Identification of **self-selection into our project and the survey**
- Monitoring of **dropouts**, an early indication of attrition

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Managing and Mitigating Bias in M&E

Mitigation Bias in ActivityInfo

Scenario

Under the unconditional cash project, we have decided to employ a baseline and endline survey. As per project design, we acknowledge that we may have self-selection into our project. We have decided to include both project participants and non project participants in both the baseline and endline survey.

In order to mitigate the risk of bias, we have asked our MEAL team to create timely a report, including the endline survey as the results as coming. The report has been created when data collection for the endline starts. The report focus in the identification of (a) self selection and (b) attrition related bias.

We want to share back with the supervisors and the partner staff for their input.

The link of the report can be found here

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Q&A

Resources

- [ODI: how cognitive biases affect monitoring, evaluation and learning](#)
- [IZA: What Methods May Be Used in Impact Evaluations of Humanitarian Assistance?](#)
- [OECD DAC Evaluation](#)
- [Impact evaluations, bias, and bias reduction, Eriksen, Steffen](#)
- [African Development Bank](#)

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