Introduction: Data available for malaria and its impact on decision-making

Role of Data in Malaria Policy Making
- Maximize impact of limited resources by determining which interventions (insecticide treated nets, indoor residual spraying, etc) to implement in a given region
- Compare studies conducted in different areas

Variable, Low Quality Malaria Data
- Malaria intensity is measured using several indicators: prevalence, incidence, and EIR (entomological inoculation rate)
- Problem: studies of malaria measure different indicators, and the indicators are not correlated linearly, especially at high intensity of transmission (Figure 2).
- Problem: Indicators that correlate best with transmission intensity are most expensive to measure, and so are measured least frequently (Figure 3).

Compromised Decision Making
- Policy makers are required to mentally compare data presented in different forms (i.e. different indicator measurements)
- Relationship between indicators is difficult to understand, making both comparison between studies and evaluation of an intervention’s efficacy difficult.

Expert Overconfidence
- In other fields, experts have been shown to be overconfident in their ability to evaluate data and make decisions, especially when there is variation in the measurement used for the data
- We hypothesized that malaria policy makers are also overconfident in their ability to make decisions based on low-quality and variable data.

Example Scenario:
An intervention (for example, insecticide-treated bed nets) is implemented in a given village. Data is collected pre and post-intervention to evaluate its success.

If EIR is measured:
- A decline in EIR is detected
- The intervention is evaluated as effective
- The intervention will continue to be implemented in the village, and may be expanded to elsewhere.

If Prevalence is measured:
- No decline in prevalence is detected, because at high transmission intensity, the prevalence curve flattens out (Figure 2).
- The intervention is evaluated as ineffective
- The intervention is halted and is likely not employed elsewhere.

Solutions and Next Steps
- Investigate phenomenon of expert overconfidence in decision-making for malaria policy - does it occur in real-world settings with malaria data?
- Develop a “universal indicator” to be used for cross-study comparison. This could be either EIR, or a new indicator
- For future data collection, focus on collecting high quality (EIR) data in a smaller number of regions, rather than collecting low quality data (prevalence) in a wider geographical area
- Develop a web-based decision support system that presents data in a useful, non-biased, easy-to-understand manner, facilitating easy comparison of malaria data and optimizing use of data for rational decision-making.

Description of Current Project
- Literature review: categorizing articles to be used in decision-support system
- Mapping: consolidating existing data sets onto a single platform (Google Earth) to be potentially used in web-based decision support system
- Brainstorming: investigating what formats of information presentation are easiest to understand and facilitate optimal decision making (in future, surveys of students and policy makers)
- Communication: developing clear visual representation of relationship between malaria indicators

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