RBM Partnership
To End Malaria

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Practical checklist for using routine data to measure VC impact

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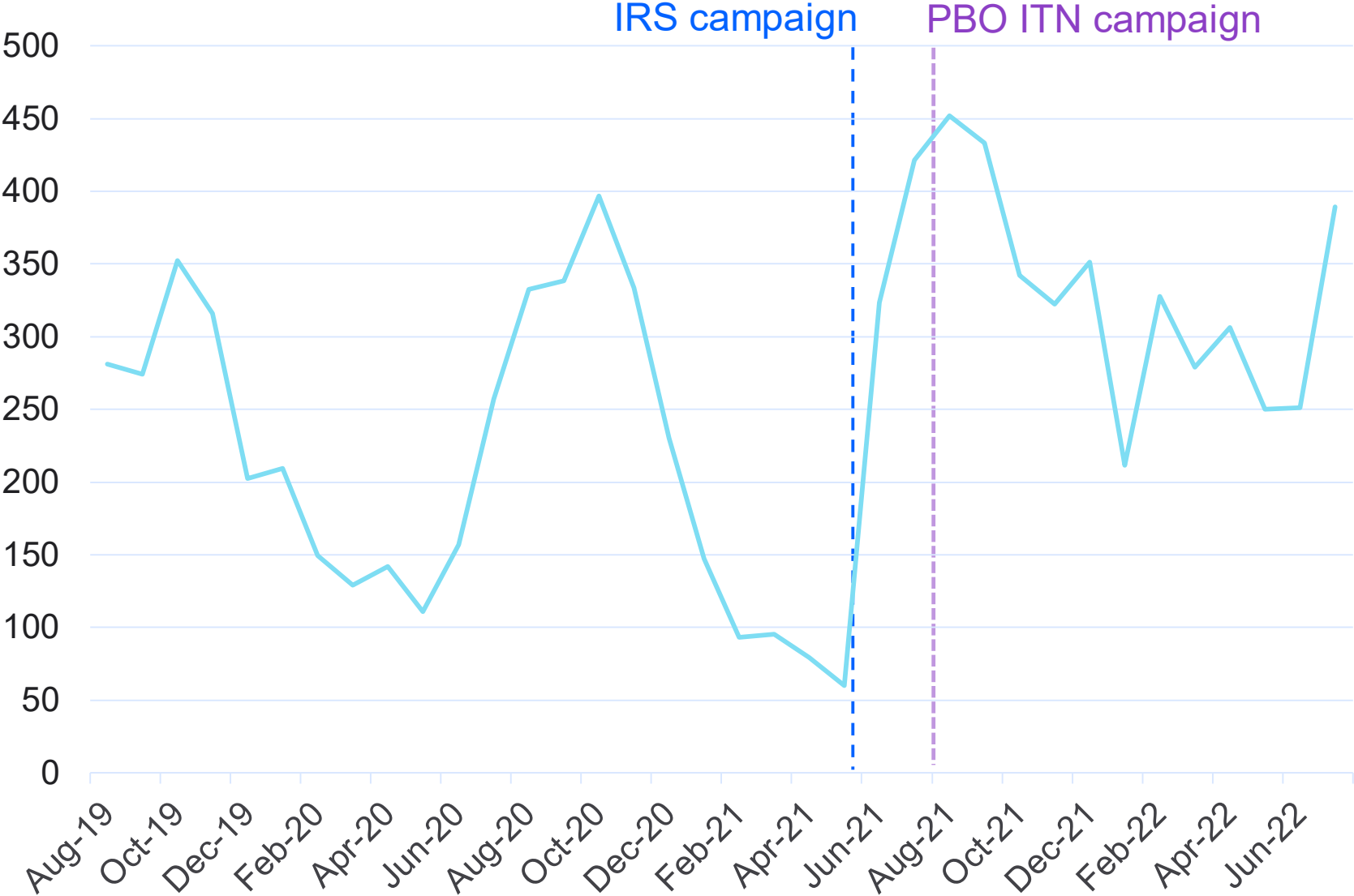
Background

- Progress in the fight against malaria has slowed in recent years, particularly in high burden countries

- Factors include funding gaps, leading to gaps in intervention coverage, & increasing insecticide resistance

- To combat resistance, national malaria programs & partners are deploying new vector control interventions:

  - Next generation ITNs, with pyrethroid plus a synergist or another insecticide

  - Long-lasting, non-pyrethroid IRS formulations

- Monitoring the impact of vector control interventions can support tailoring of vector control programs

- In some cases, reviewing trends in routine malaria case data may lead to unexpected findings, such as increases in cases in the period after an intervention

- Systematically compiling and analyzing all available data can help to to properly investigate and identify possible reasons for observed trends in malaria cases

- A checklist of key questions, indicators and data sources can guide these investigations

Vector Control Impact Monitoring Checklist

| Checklist area	Specific questions
1. Location & context	a. What specific administrative areas (and level) are you interested in analyzing?
	b. What time period are you interested in analyzing? (i.e. including before/after intervention?)
	c. What are the climate trends in the area? What are any other geological markers that may impact malaria burden?
	d. What do we know about population-based factors, such as migration, industry, etc., that may contribute to differences in malaria burden?
2. Malaria case burden trends	a. What are the trends in malaria cases or malaria case incidence?
	b. What threats exist to interpreting case data, such as missing values, outliers or inconsistencies?
3. Entomological trends	a. What are the primary vectors in the areas of interest?
	b. What are the trends in vector density indicators?
	c. What are trends in sporozoite rate, EIR and parity?
	d. What are trends in insecticide resistance?
4. Vector control Interventions	a. What intervention was implemented?
	b. When were the interventions implemented?
	c. What was the coverage of the intervention?
	d. What is individuals' exposure to the intervention? Including ITN use, time spent indoors and under ITNs, mosquito locations Intervention exposure
	e. How long do we expect the vector control intervention to be effective?
5. Other interventions	a. What other interventions may also impact trends in malaria case burden, outside of vector control interventions?

Fictional Example:
Why are cases going up after vector control campaigns?

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Investigating the increase: Location & Context & Malaria Case Burden Trends

Findings: Increase in 3 districts, decrease in 1 district (District B, IRS)
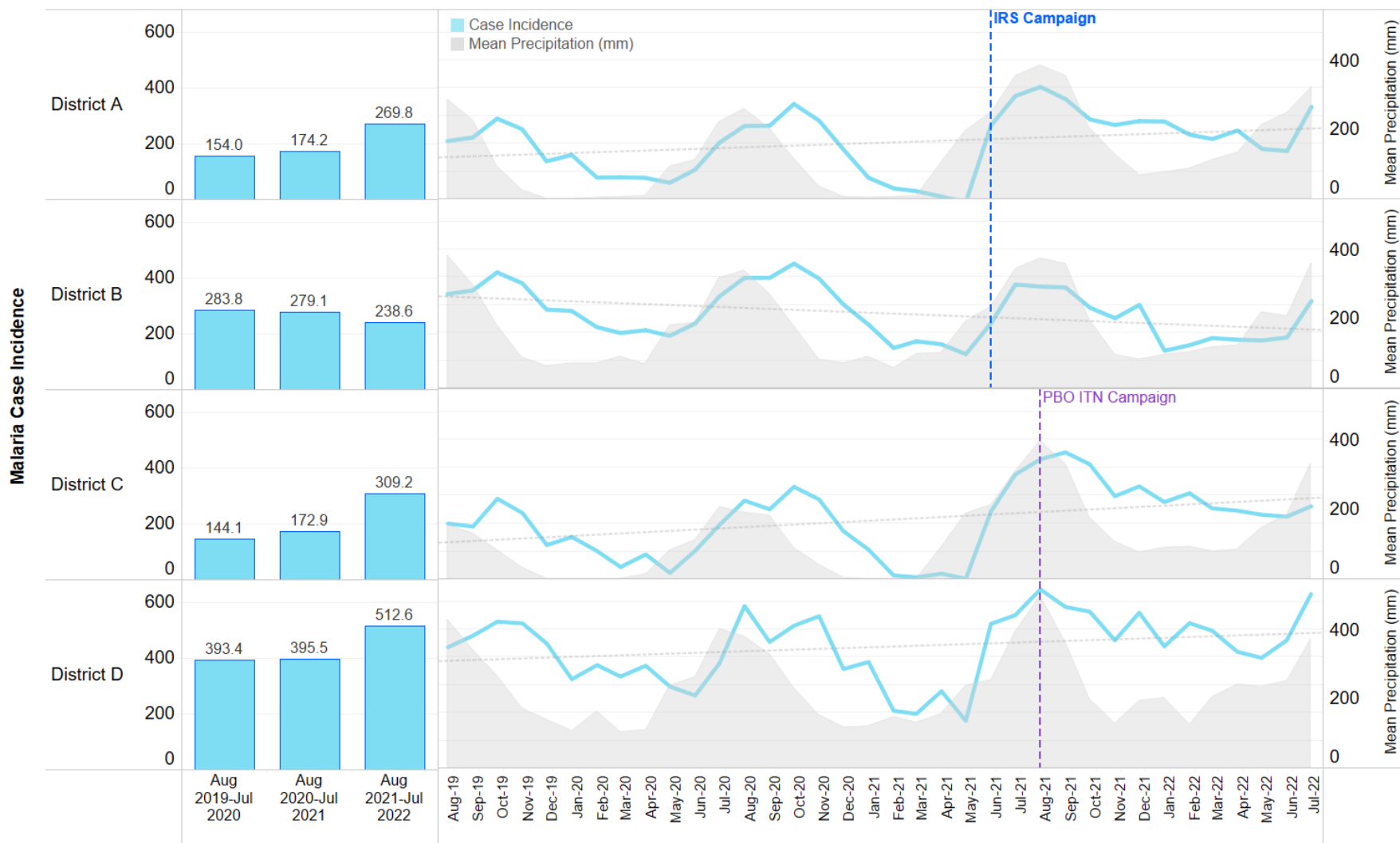
Location & context:
- Show cases by Intervention & District
- Rainfall (some ↑ 2021)
- Not shown: no major population movement

Malaria Case Burden:
- Include health facilities with complete data
- Remove outliers
- Present annual & monthly trends
- Not shown: Reviewed trends in outpatients (stable), CHW diagnoses (stable), RDT stock (no major stockouts)

Example includes simulated data, not actual country data

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Selection of other checklist areas: Entomological & Vector control interventions

Checklist area	Specific questions	Results
3. Entomological trends	d. What are trends in insecticide resistance?	IRS: Clothianidin, 100% mortality PBO ITN: Deltamethrin + PBO, 98% -> 54% mortality at 12 months
4. Vector control Interventions	a. What intervention was implemented?	IRS with clothianidin (2 districts) PBO ITNs (2 districts)
	b. When were the interventions implemented?	June 2017: pyrethroid ITNs, all districts June 2021: IRS August 2021: PBO ITNs
	c. What was the coverage of the intervention?	IRS: District A: 60%; District B: 90% PBO ITN: District C: 92%, District D: 90%
	d. What is individuals' exposure to the intervention? Including ITN use, time spent indoors and under ITNs, mosquito locations Intervention exposure	No information available on individual exposure, this could be an area for future data collection
	e. How long do we expect the vector control intervention to be effective?	IRS: 10 months above 90% mortality, each year PBO ITNs: Baseline: 92% mortality, 12 months: 53%

Investigation Summary

- Overall increase in malaria case incidence;

- Increase in 3 districts (1 IRS + 2 PBO ITN), decrease in 1 (District B, IRS)

- Lack of control area that did not receive any intervention

Possible explanations:

- **PBO ITN:** waning durability, Increase in insecticide resistance (PBO not synergizing fully)
- **IRS:** Higher intervention coverage in District B when compared to District A

Other areas to investigate:

- **Location & Context:**

  - Geological markers that may impact District B compared to other districts?

  - Longer time period: what are trends over multiple intervention years?

- **Vector Control interventions:**

  - Why coverage low in District A? Refusals, challenges in reaching population?

  - Can we collect information on individual exposure to PBO ITNs and IRS?

- **Entomological trends:** do we see similar trends in density, sporozoite, EIR, & parity?

- **Other interventions:** Are there other interventions, especially in District B, that may impact trends?

Conclusion, Discussion, & Next Steps

Conclusion

- Triangulation & examination of routine data can help monitor impact of vector control interventions & guide intervention tailoring
- Important to systematically compile and analyze all available data for full investigation
- Reviewing routine data may not always result in clear answers around impact, analyses are still observational; formal statistical analyses or research studies may help

Discussion

- Is this a useful checklist?
- How could this checklist be strengthened?
- If useful, who would like to contribute to further checklist and guidance development?

Next Steps:

- Create full examples of integrated impact monitoring analyses for sharing

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THANK YOU!