

Progress Update

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Agenda

1. Project Scope
2. Analysis Plan
3. Specific Questions
4. Deliverables



Project Scope

The goal of the current project is to assess the accuracy of four tests used in diagnosing *Schistosoma Mansoni*.

- None of the methods yields a perfect diagnosis.
 - Accuracy must be estimated from data.
- Preference to use Latent Class Analysis (LCA) to answer the Research Question.

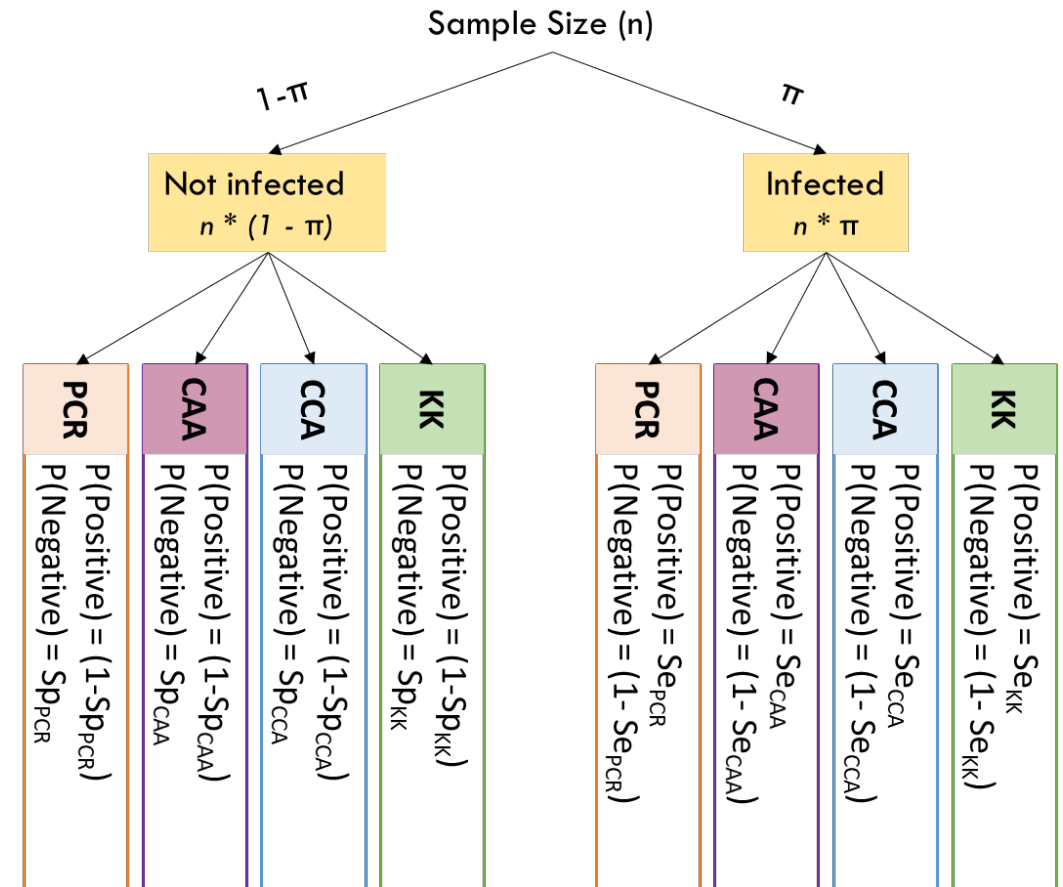
- Inspect and clean the data.
- Propose a feasible analysis plan.
- Provide easy-to-use analysis scripts.
- Aid the interpretation of the results.

Analysis Plan

Current Plan: Latent Class Analysis

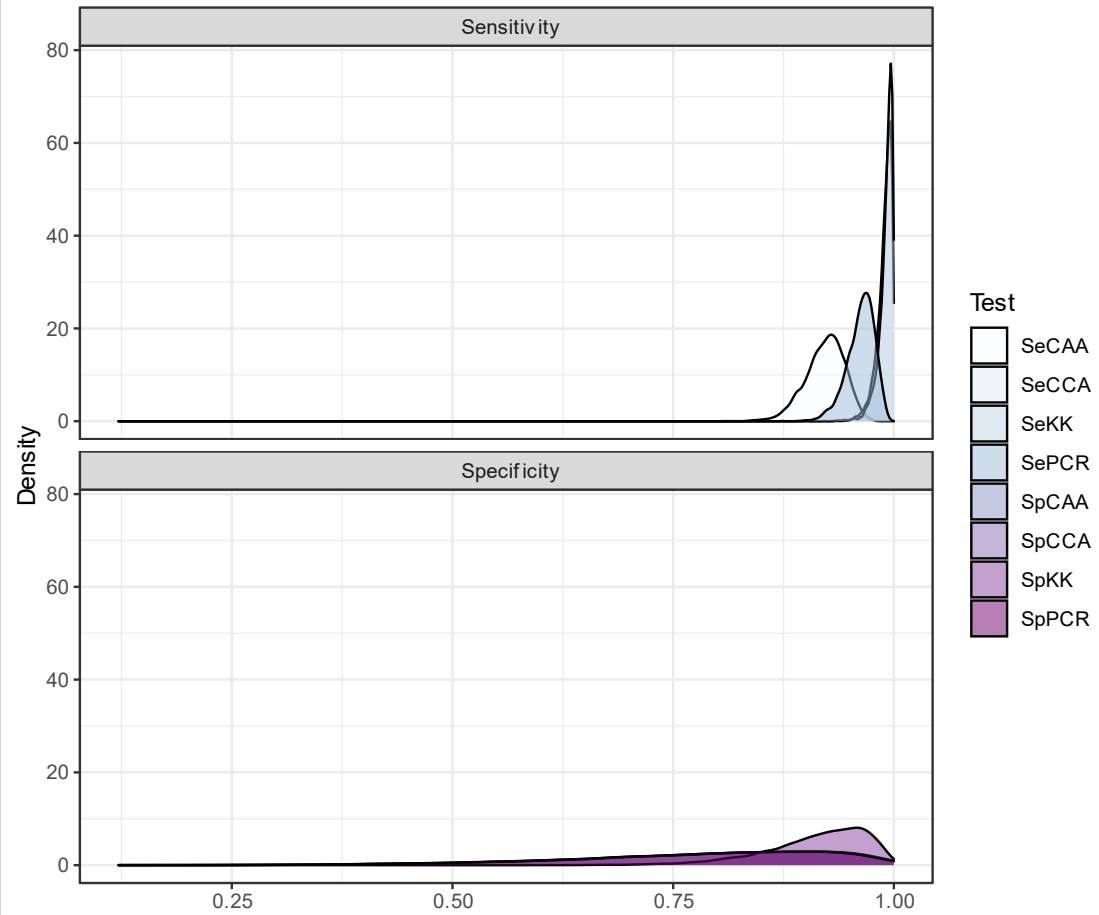
Analysis Plan

KK	CCA	CAA	PCR
1	1	1	1
1	1	1	0
1	1	0	1
1	1	0	0
1	0	1	1
1	0	1	0
1	0	0	1
1	0	0	0
1	0	0	1
0	1	1	0
0	1	1	1
0	1	0	0
0	1	0	1
0	0	1	0
0	0	1	1
0	0	0	0



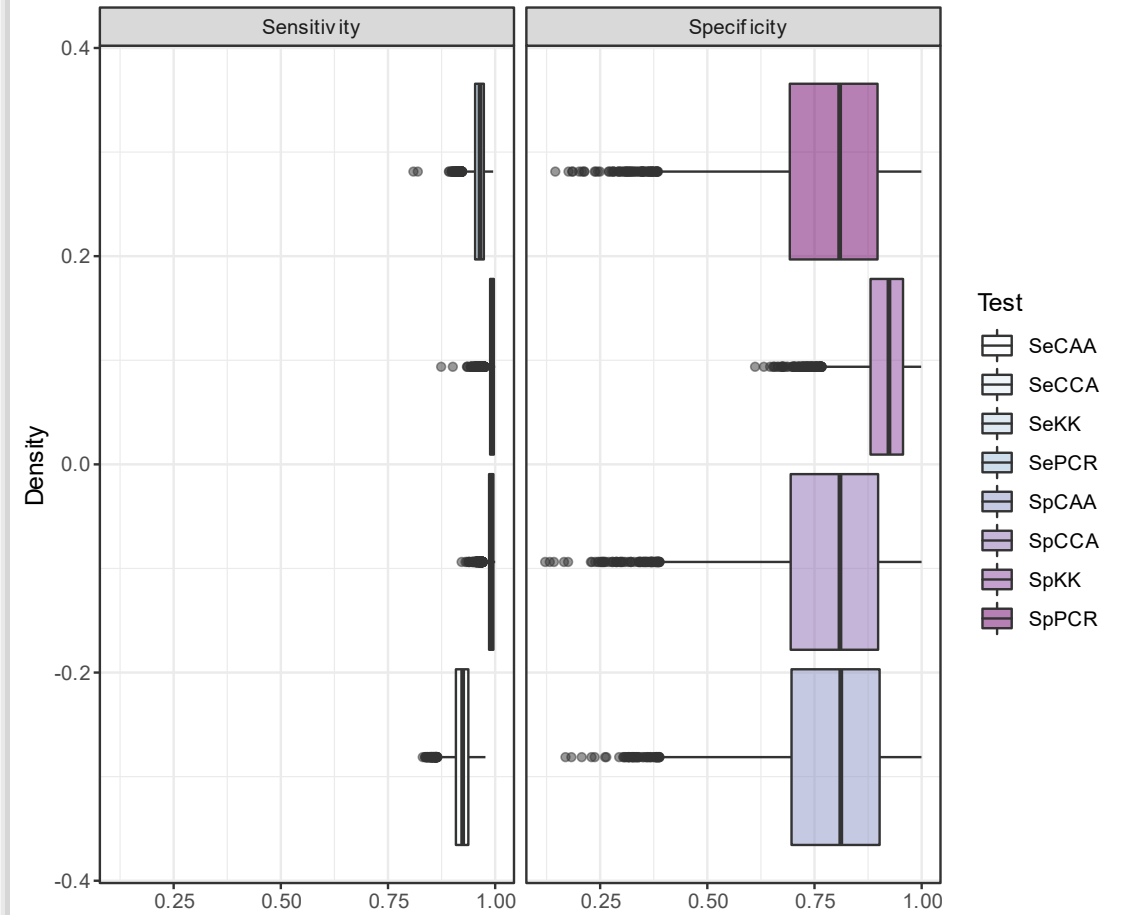
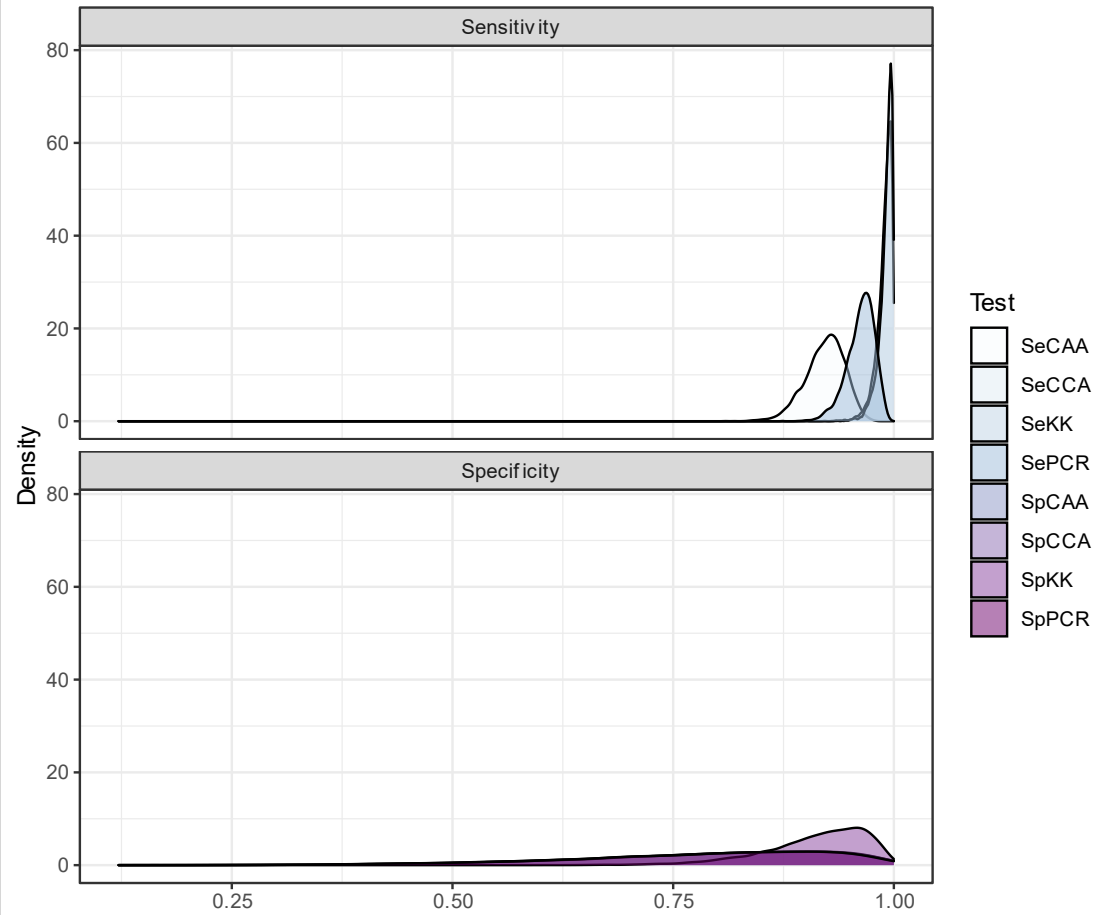
Results For The Current Plan

Analysis Plan



Results For The Current Plan

Analysis Plan



Input For The Current Plan

Analysis Plan

All diagnostic patterns may occur

KK	CCA	CAA	PCR	Total
1	1	1	1	113
1	1	1	0	2
1	1	0	1	4
1	1	0	0	17
1	0	1	1	22
1	0	1	0	1
1	0	0	1	14
1	0	0	0	18
0	1	1	1	1
0	1	1	0	3
0	1	0	1	10
0	1	0	0	11
0	0	1	1	24
0	0	1	0	11
0	0	0	1	3
0	0	0	0	0

However, what we get looks like...

KK	CCA	CAA	PCR	Total
1	1	1	1	128
1	1	1	0	4
1	1	0	1	10
1	1	0	0	0
1	0	1	1	0
1	0	1	0	0
1	0	0	1	0
1	0	0	0	0
0	1	1	1	0
0	1	1	0	0
0	1	0	1	0
0	1	0	0	0
0	0	1	1	0
0	0	1	0	0
0	0	0	1	0
0	0	0	0	0

Is This Model Appropriate?

Analysis Plan

KK	CCA	CAA	PCR
1	1	1	1
1	1	1	0
1	1	0	1
1	1	0	0
1	0	1	1
1	0	1	0
1	0	0	1
1	0	0	0

determined by design,
not by prevalence
and test accuracy

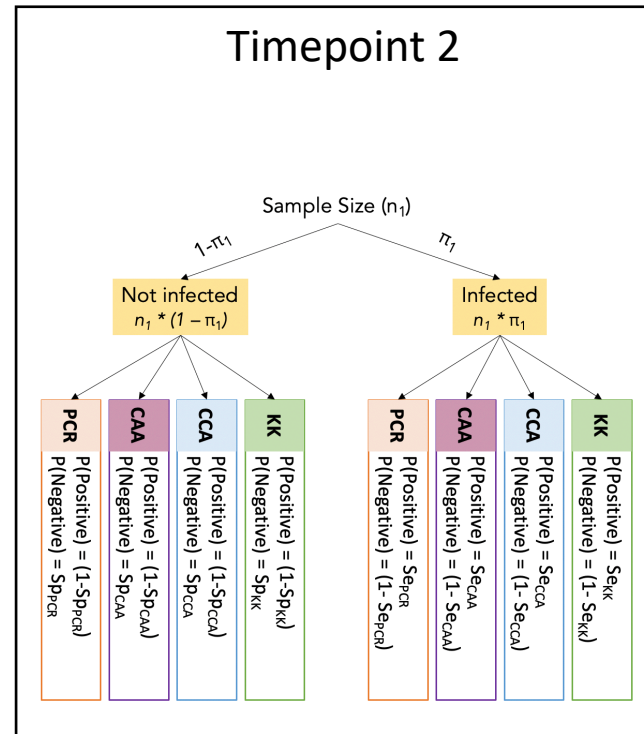


specificity and sensitivity will
be biased due to the design
choices

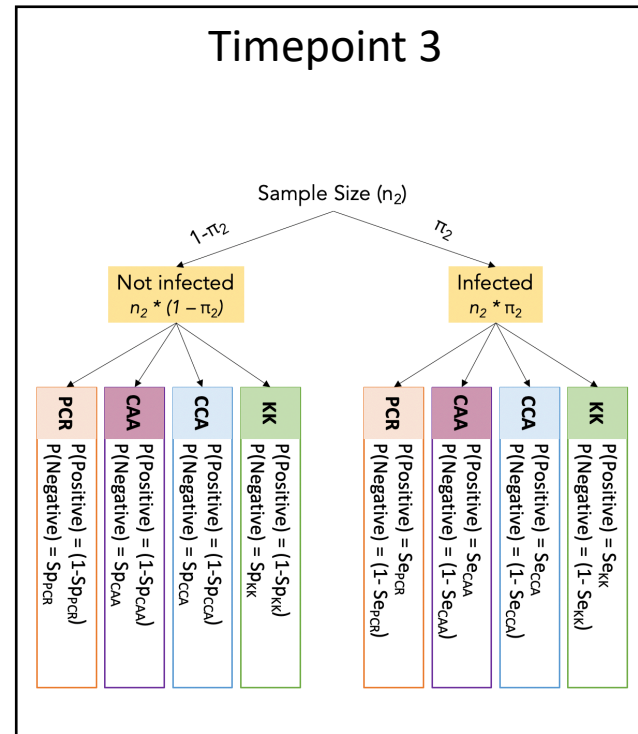
Two Possible Solutions

Analysis Plan

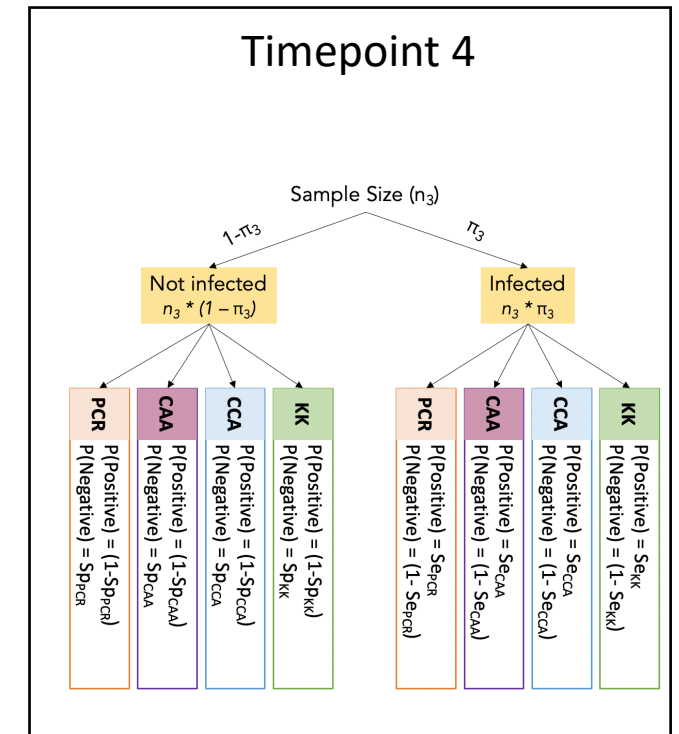
Apply LCA model on data from measurement occasions other than baseline



sensitivity and specificity



sensitivity and specificity



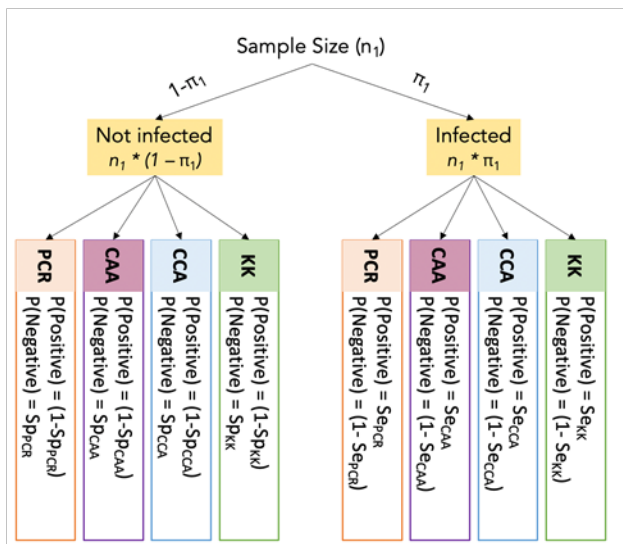
sensitivity and specificity

Two Possible Solutions

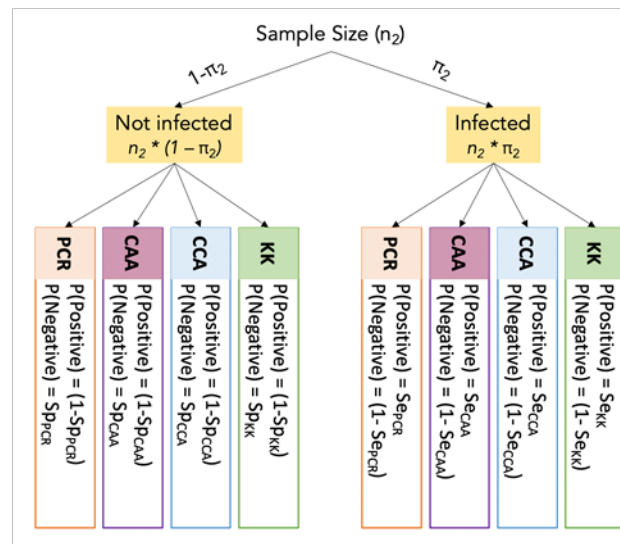
Analysis Plan

Use a unified model that integrates data from multiple measurement occasions

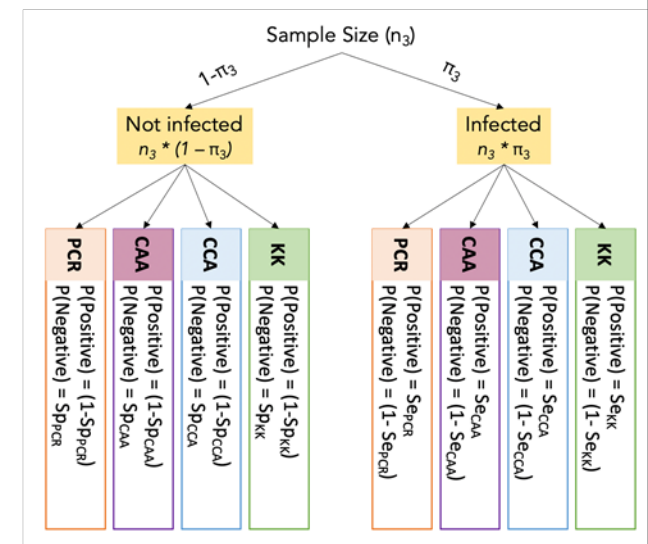
Timepoint 2



Timepoint 3



Timepoint 4



sensitivity and specificity

Can we assume that sensitivity and specificity are invariant across time points?

What priors to use for sensitivity and specificity?

PCR

(95% confidence interval + expected value)

Deliverables

- Script for LCA that can be used out of the box.
- Simulated data for all measurement occasions.
- General directions on how to interpret the results.
- Results summarized as:
 - table with parameter estimates and credible intervals
 - density plots of the posterior distributions

A Final Few Questions

Analysis Plan

What format to expect for the complete dataset?

wide

long

How shall we handle a trace outcome for the POC-CCA test?

Thanks!