

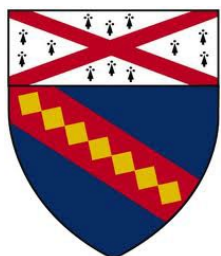
**Rotacoster: A tool for estimating the disease burden, impact, and cost-effectiveness of rotavirus vaccination in low- and middle-income countries**

**Jiye Kwon**

01 October 2025, 15th International Rotavirus Symposium

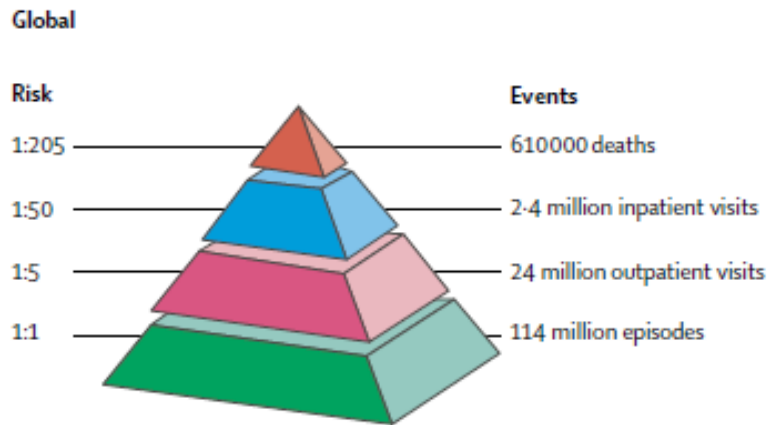
Epidemiology of Microbial Diseases,

Yale School of Public Health



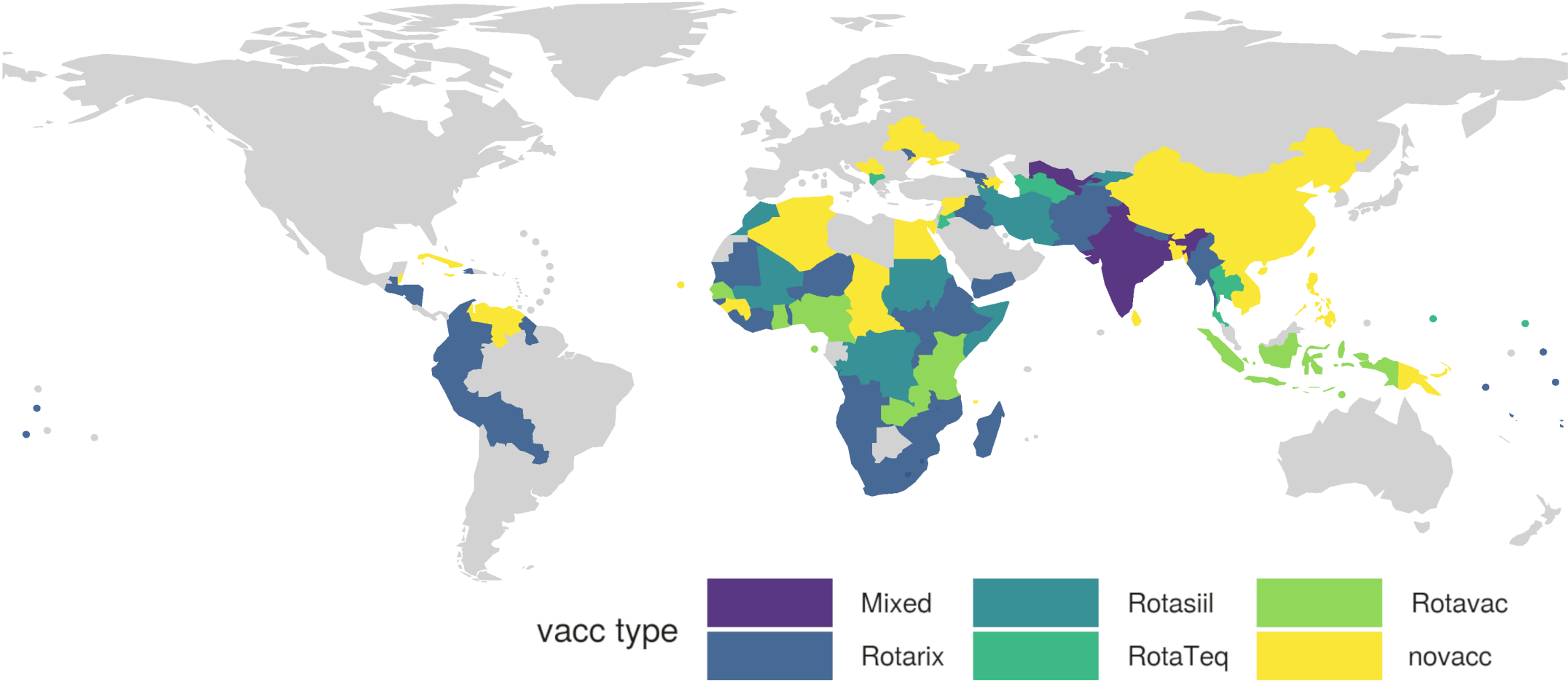
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- 20 years of post-licensure of rotavirus vaccine
- Rotavirus vaccines have been introduced in 131 countries (end of 2024)
- **Problem:** Less optimal vaccine performance in high child mortality countries



Child mortality rate	Rotarix VE* in any age group
Low	83% (78–91)
Middle	67% (40–75)
<b>High</b>	<b>58%</b> (54–64)

Rotavirus vaccine introduction and vaccine type

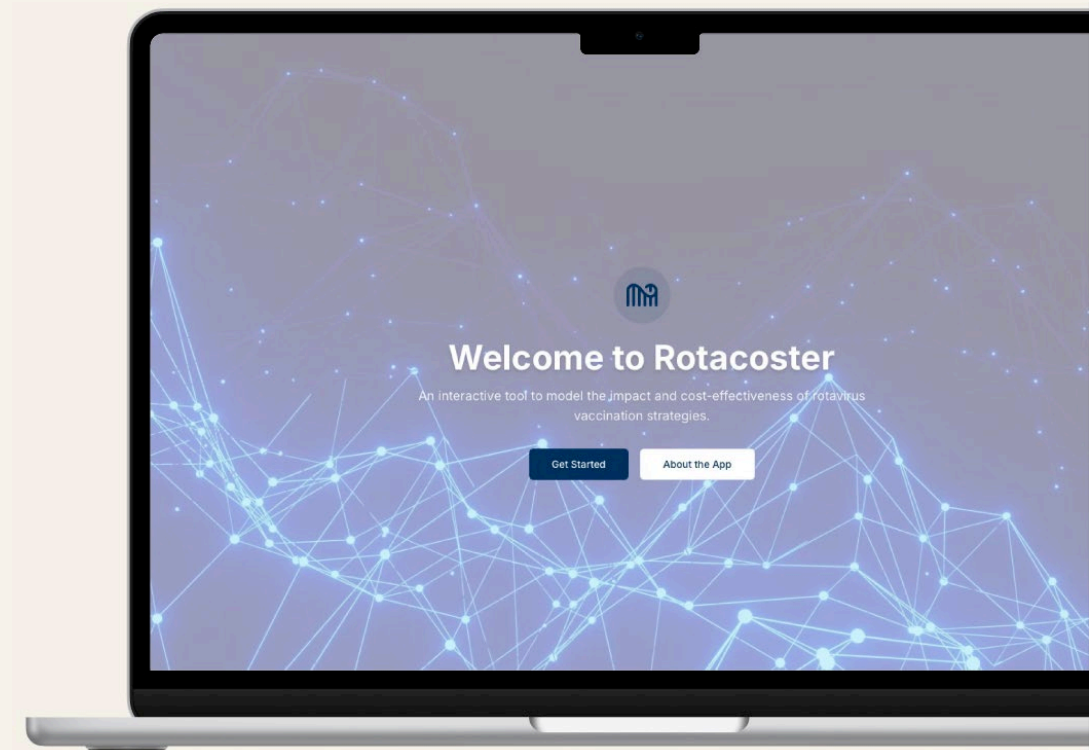


- Some countries have yet to introduce RV
  - Which RV should they choose?
  - What is the optimal schedule?
- Some countries may want to modify the current schedule
  - Switch to next-generation RV?
  - Adding a 3<sup>rd</sup> dose?
  - Cheaper per dose but more doses required?
- Current Gavi-eligible countries may graduate out of Gavi-eligibility
  - Anticipated cost?

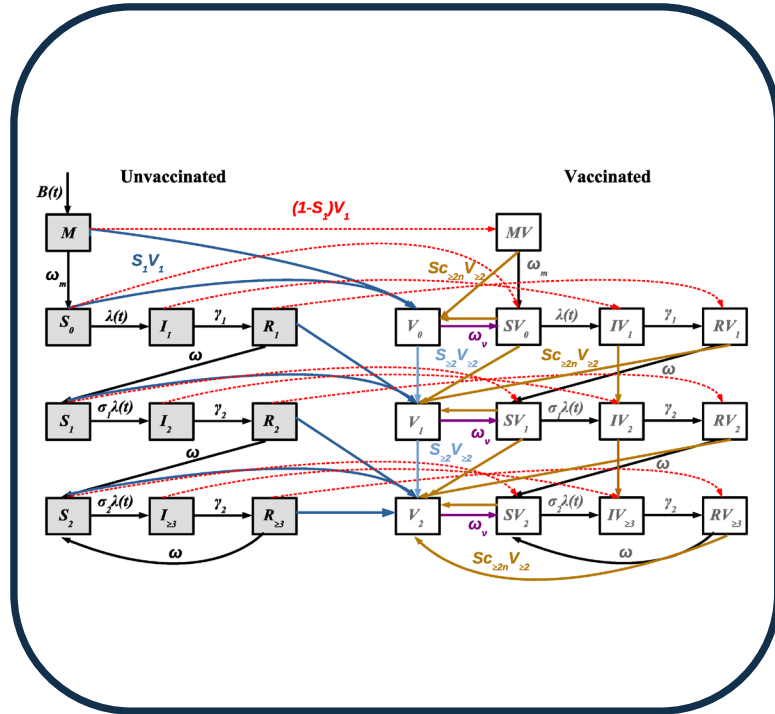
How do we empower decision-makers to make the most impactful choices?

**Our answer is Rotacoster.**

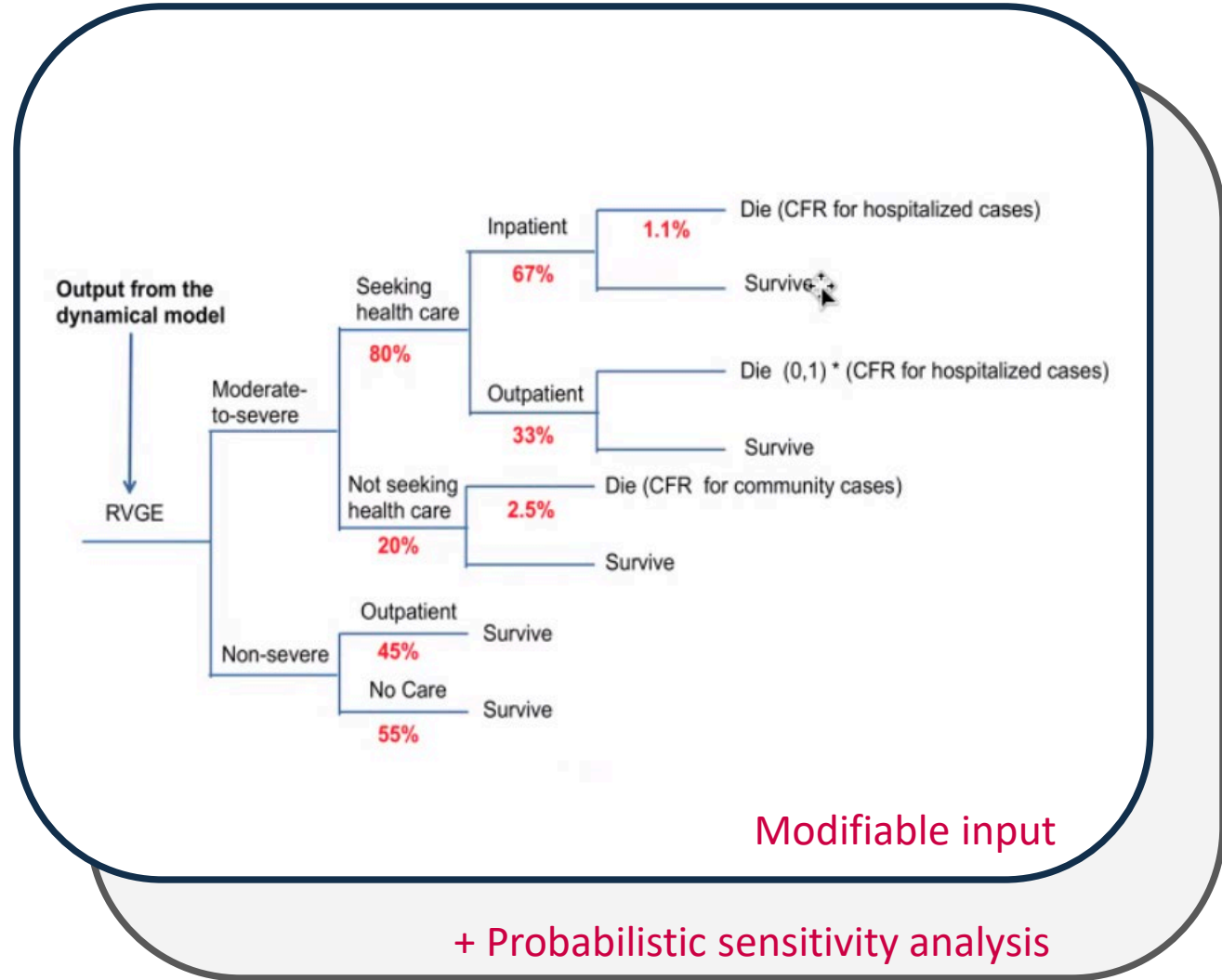
**A tool** that quantifies potential disease burden, impact and cost-effectiveness of **rotavirus vaccines** on a **country-specific** basis.



## Country-specific disease dynamics



## Cost-effectiveness analysis



**Session VI (1436)** Quantifying Impacts and Identifying Strategies to Improve Rotavirus Vaccines in Low- and Middle-Income Countries

## Country-specific disease dynamics

### Transmission dynamic model:

- Predicted country-specific vaccine response
- Coverage
- $R_0$
- Incidence
- Direct and indirect vaccine effectiveness

## Cost-effectiveness analysis

### User modifiable input:

- Pre-populated default options
- Cost-related data
- Health-seeking behavior

## Country-specific disease dynamics

### Transmission dynamic model:

- Predicted country-specific vaccine response
- Coverage
- $R_0$
- Incidence
- Direct and indirect vaccine effectiveness

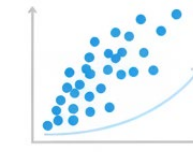
## Cost-effectiveness analysis

### User modifiable input:

- Pre-populated default options
- Cost-related data
- Health-seeking behavior

## Actionable insights

1,633,000  
Lives Saved



Hospitalizations Averted



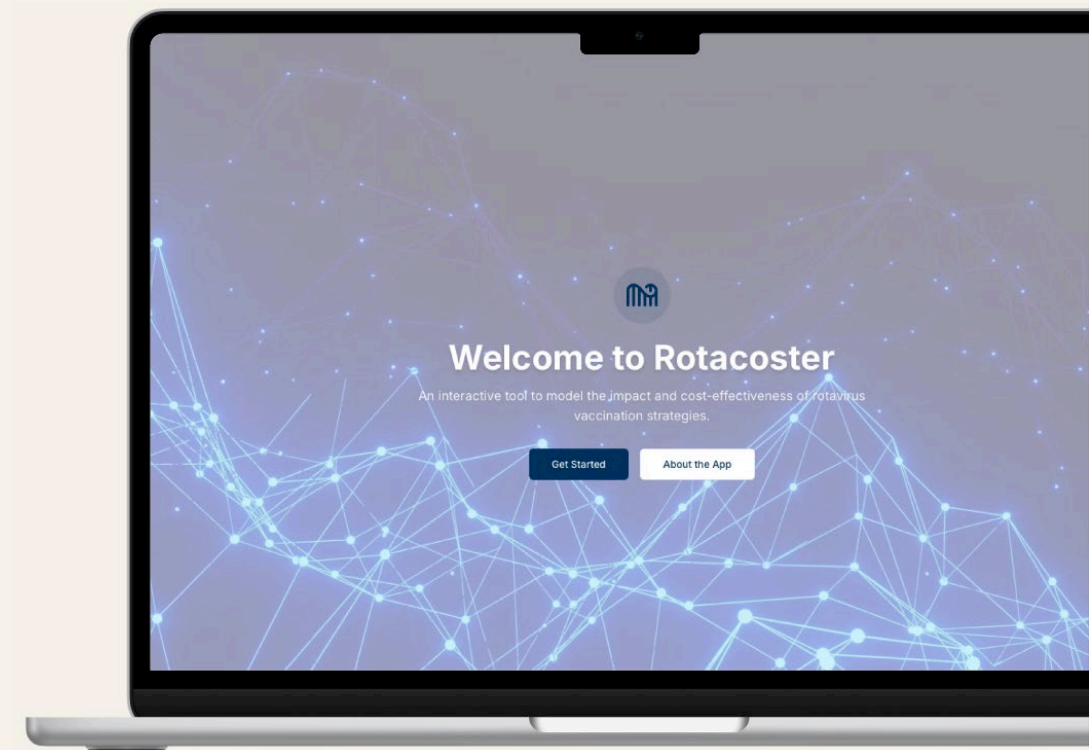
\$

Net Cost/DALY Averted

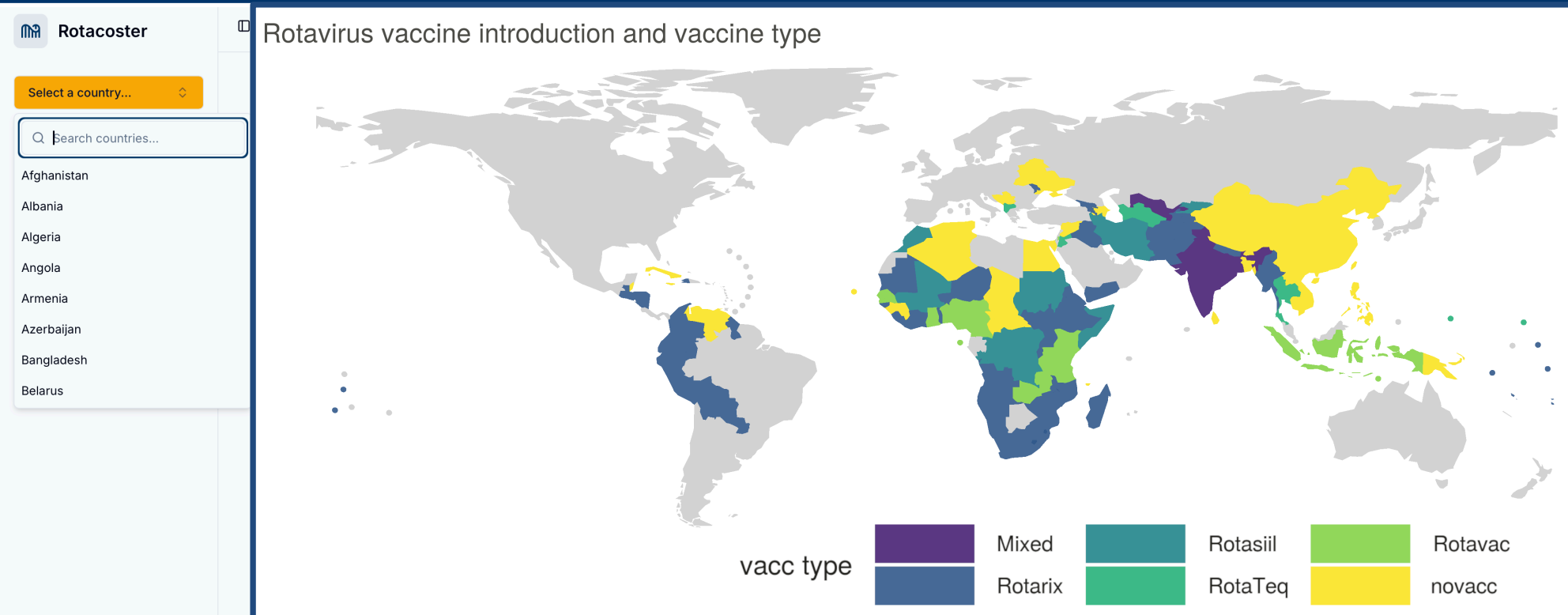
	\$	↕	↕
Strategy A		↕	↕
Strategy A		C	
Strategy B		C	



- ✓ Comparative Health and Economic Outcomes
- ✓ Downloadable Reports for Policy Briefs



# 1. Country selection



Prototype includes **Ethiopia, Ghana, Kenya, Malawi, and South Africa,**

# 2. Disease burden tab

Rotacoster

Welcome

Select a country...  
Search countries...  
Afghanistan  
Albania  
Algeria  
Angola  
Armenia  
Azerbaijan  
Bangladesh  
Belarus

Rotacoster

Malawi

Malawi Dashboard

Disease Burden Cost-Effectiveness

Generate Report

### Vaccine Information

Key details about the national rotavirus vaccine program.

Introduction Year	2012
Dosing Schedule	2 doses
Current Coverage	85%

### Projected 5-Year Trend

Projected annual rotavirus cases under the current scenario.

Year	Projected Annual Rotavirus Cases
2026	~70,000
2027	~70,000
2028	~70,000
2029	68,940
2030	~70,000

### Scenario Modeler

Adjust parameters to project the health and economic impact of vaccination.

Scenario Start Year: 2025

Projection Duration: 5 Years

### Scenario Modeling Approach

This country has a 2-dose vaccine program. Select a strategy to model.

Status Quo Modify 2-Dose Program Switch to 3-Dose Suspend Vaccination

# 2. Disease burden tab

The screenshot shows the 'Rotacoster Malawi Dashboard' with a 'Scenario Modeler' section. The interface includes a sidebar with the Rotacoster logo and a dropdown menu set to 'Malawi'. The main content area is titled 'Scenario Modeler' and contains several interactive elements: a 'Scenario Start Year' dropdown set to 2025, a 'Projection Duration' slider set to 5 years, and a 'Scenario Modeling Approach' section with four options: 'Status Quo', 'Modify 2-Dose Program' (highlighted with a blue border), 'Switch to 3-Dose', and 'Suspend Vaccination'. Below these are sections for 'Change Vaccine Coverage' (disabled), 'Add Neonatal Dose' (enabled), 'Neonatal Dosing Schedule' (radio buttons for 1-6-10 Weeks and 1-10-14 Weeks), and 'Vaccine Coverage' (radio buttons for 'Use Current Coverage (85%)' and 'Change coverage'). At the bottom, a 'Set coverage rate:' section features buttons for 50%, 60%, 70%, 80%, 90%, and 95% (selected).

2-dose country  
3-dose country  
No vaccination



Rotacoster Malawi Dashboard

Malawi

### Scenario Modeler

Adjust parameters to project the health and economic impact of vaccination.

Scenario Start Year: 2025

Projection Duration: 5 Years

#### Scenario Modeling Approach

This country has a 2-dose vaccine program. Select a strategy to model.

- Status Quo**  
Continue with current 2-dose program.
- Modify 2-Dose Program**  
Change coverage or add neonatal dose.
- Switch to 3-Dose**  
Change the vaccine program to a 3-dose series.
- Suspend Vaccination**  
Model the impact of stopping the program.

**Change Vaccine Coverage**

**Add Neonatal Dose**

**Neonatal Dosing Schedule**

1-6-10 Weeks  1-10-14 Weeks

**Vaccine Coverage**

Use Current Coverage (85%)  Change coverage

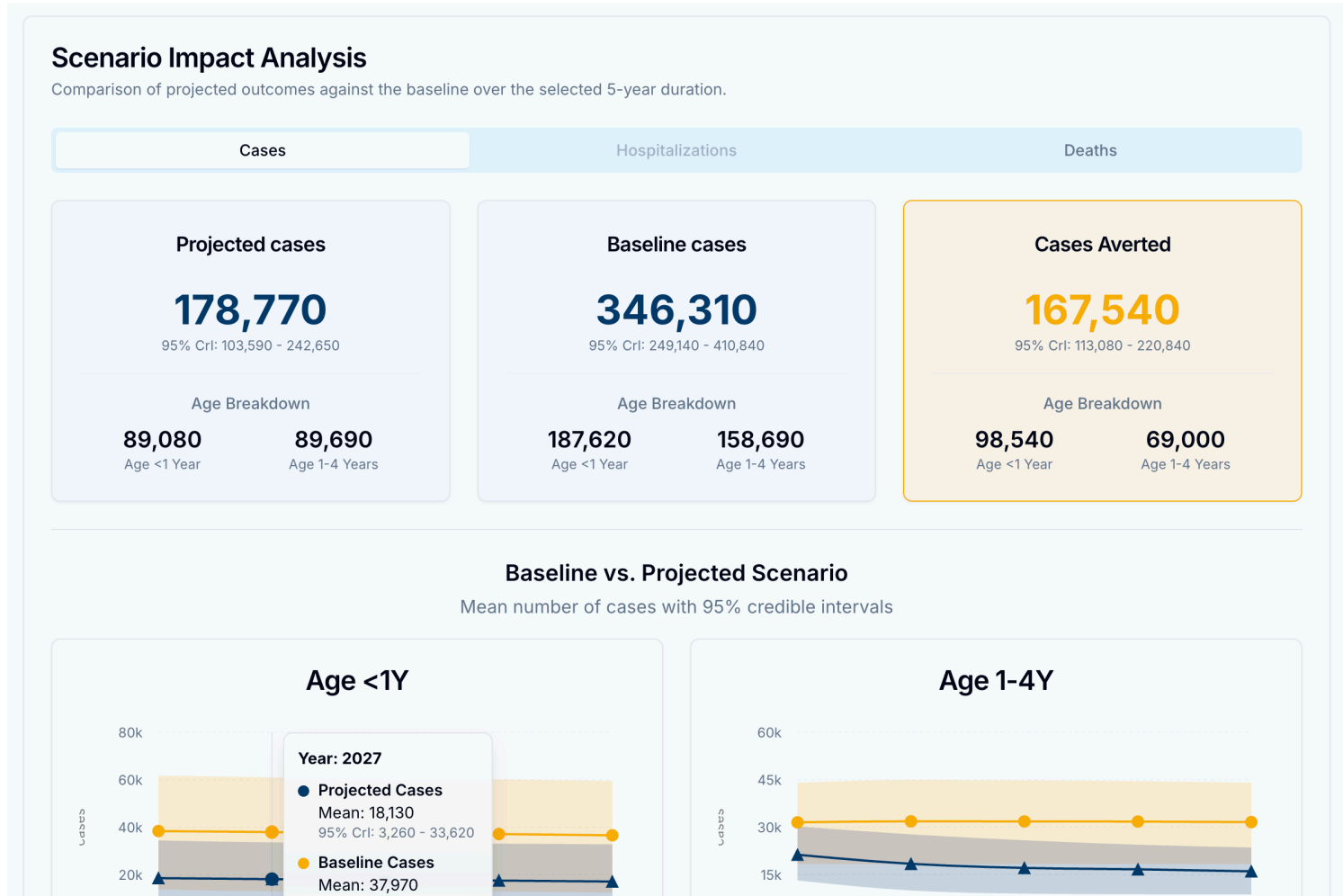
Set coverage rate: 95%

50% 60% 70% 80% 90% 95%

Run Scenario



# 2. Disease burden tab – sample output



# 3. Cost-effectiveness analysis

**Malawi Dashboard**

Disease Burden Cost-Effectiveness Generate Report

**Current Selection**

Vaccine Strategy	Modify 2-Dose Program
Neonatal Dose Added	Yes
Coverage Type	Assigned
Assigned Coverage	95%
Projection Period	2026 to 2030

**Willingness-to-Pay Analysis**  
Evaluate if the current scenario is optimal based on your economic threshold.

Currency: USD Threshold By:  GDP  Absolute

USD  International Dollar  Local Currency

**0.50x**

Run Analysis

**Projected Vaccination Cost**  
\$0  
95% CrI: \$0 - \$0

**Net Cost**  
\$0  
95% CrI: \$0 - \$0

**Cost-Effectiveness**

Acceptability Frontier Cost-effectiveness Plane Summary

Coming Soon!

**Malawi Dashboard**

Disease Burden Cost-Effectiveness Generate Report

**Current Selection**

Vaccine Strategy: **Modify 2-Dose Program**

Neonatal Dose Added: **Yes**

---

Coverage Type: **Assigned**

Assigned Coverage: **95%**

---

Projection Period: **2026 to 2030**

**Projected Vaccination Cost**

**\$0**

95% CrI: \$0 - \$0

**Net Cost**

**\$0**

95% CrI: \$0 - \$0

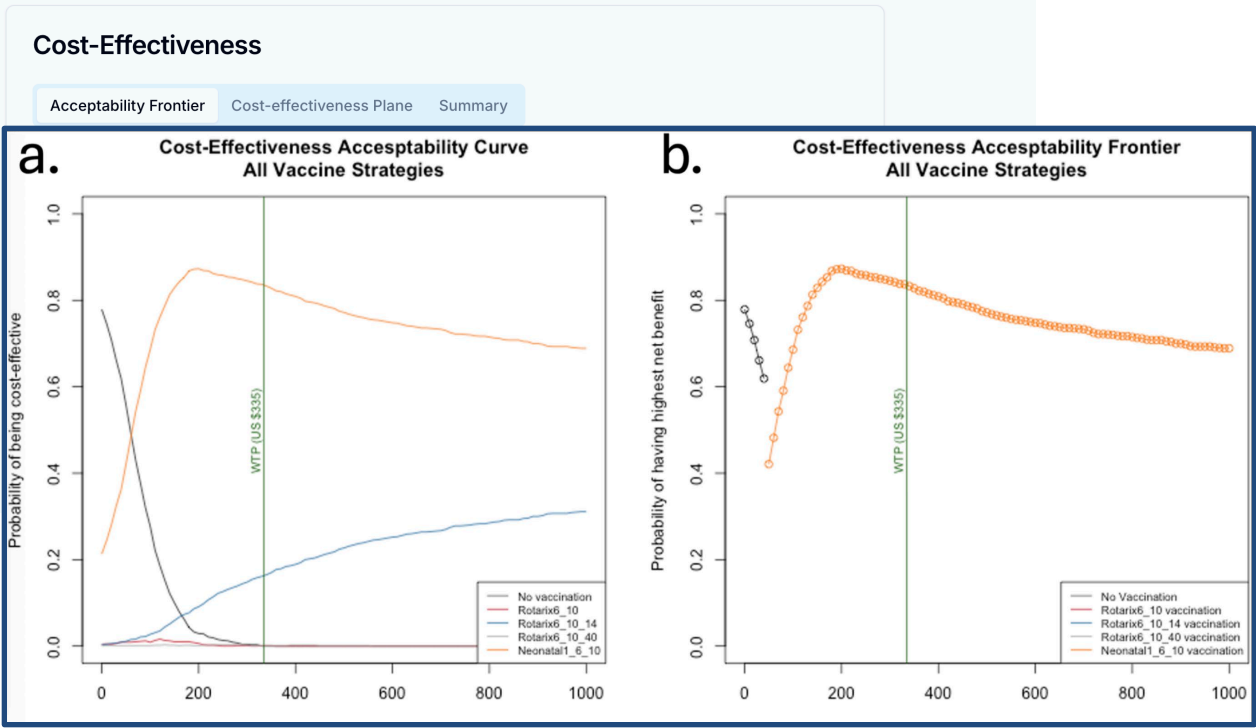
**Willingness-to-Pay Analysis**

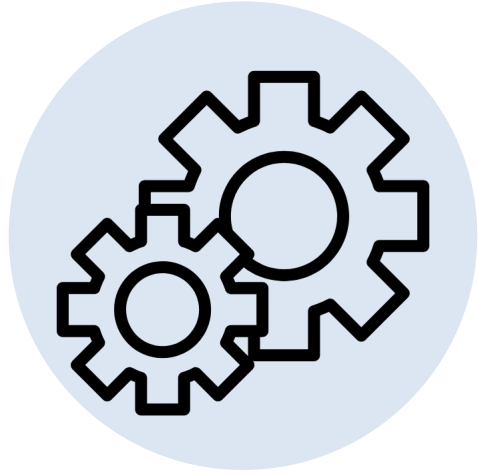
Evaluate if the current scenario is optimal based on your economic threshold.

Currency: **USD**

Threshold By:  GDP  Absolute

GDP per Capita Factor: **0.50x**





Try it out!

[Rotacoster.org](https://rotacoster.org)



Feedback!

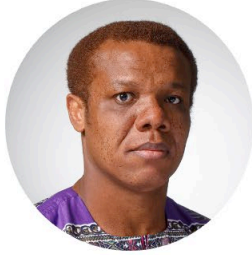
# Let's connect!

Yale

## Team Rotavirus @ Pitzer Lab



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Prototype demo



Feedback form



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National Institute of Allergy and Infectious Diseases

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