

A framework for predicting the impacts of rabies control and prevention strategies

Martha Luka

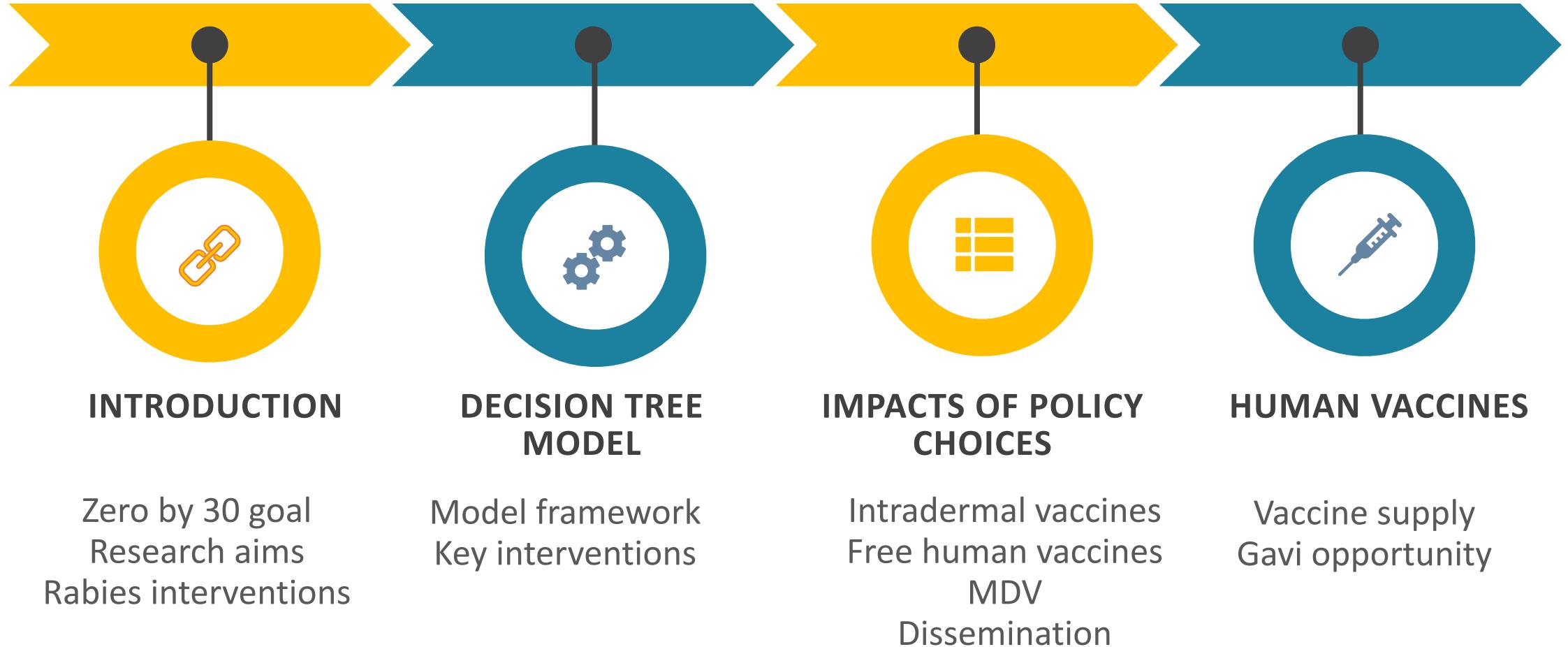
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Katie Hampson | Dan Haydon | Elaine Ferguson

.1@research.gla.ac.uk

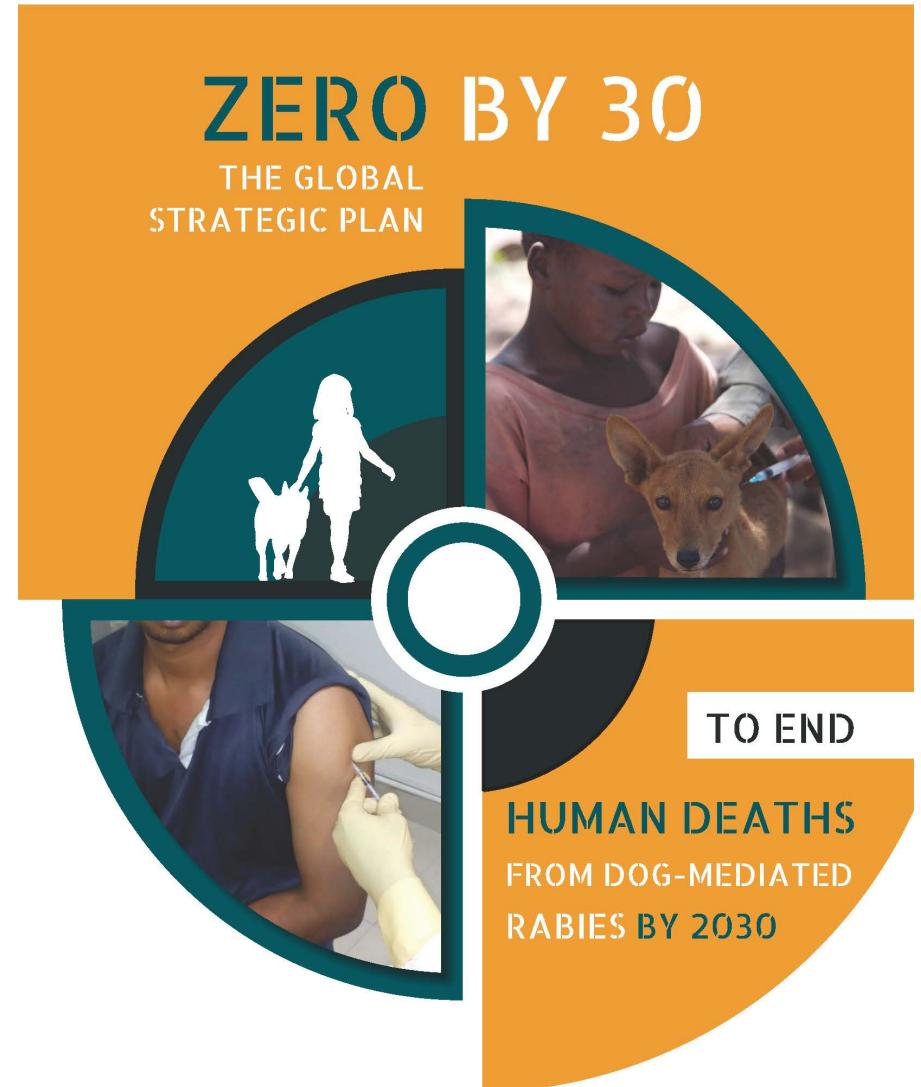


Roadmap



Zero by '30

- There are concerted efforts to eliminate human rabies by 2030
- Recognizes that rabies is a preventable disease
- Key interventions:
 - ✓ mass dog vaccination (MDV)
 - ✓ post-exposure prophylaxis (PEP)
- Impacts of interventions not examined across populations to support planning



Food and Agriculture
Organization of the
United Nations



WORLD ORGANISATION
FOR ANIMAL HEALTH



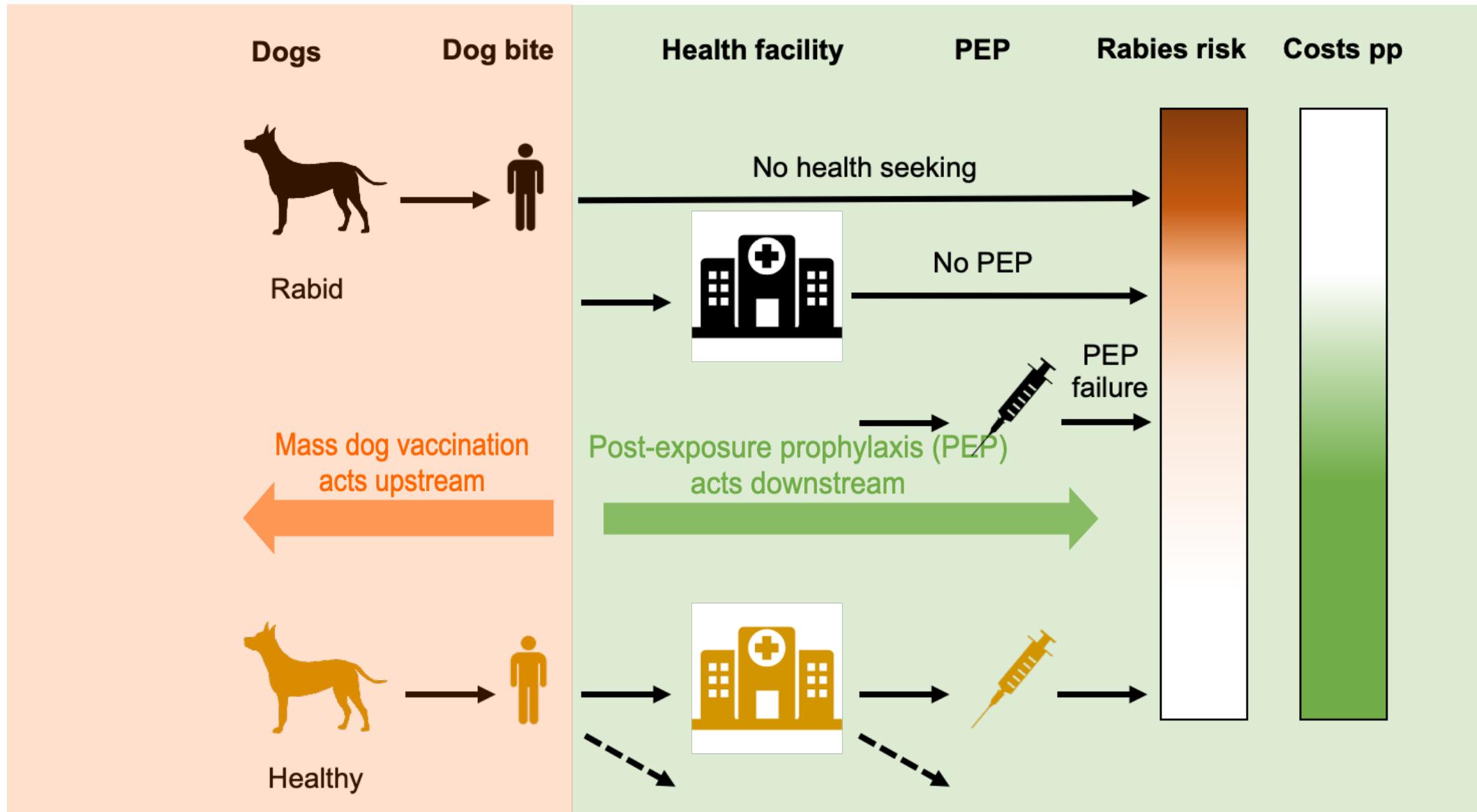
World Health
Organization



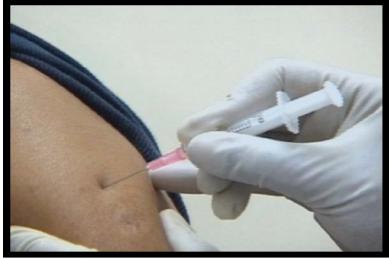
Research Aims

1. To develop a decision tree model to inform regional coordination and policy on human rabies elimination
2. To develop a framework to support stakeholders in planning rabies surveillance and prevention
3. To develop a model to support a robust human rabies vaccine supply chain management
4. To understand the role of geographical connectivity in achieving and maintaining rabies freedom

Rabies interventions



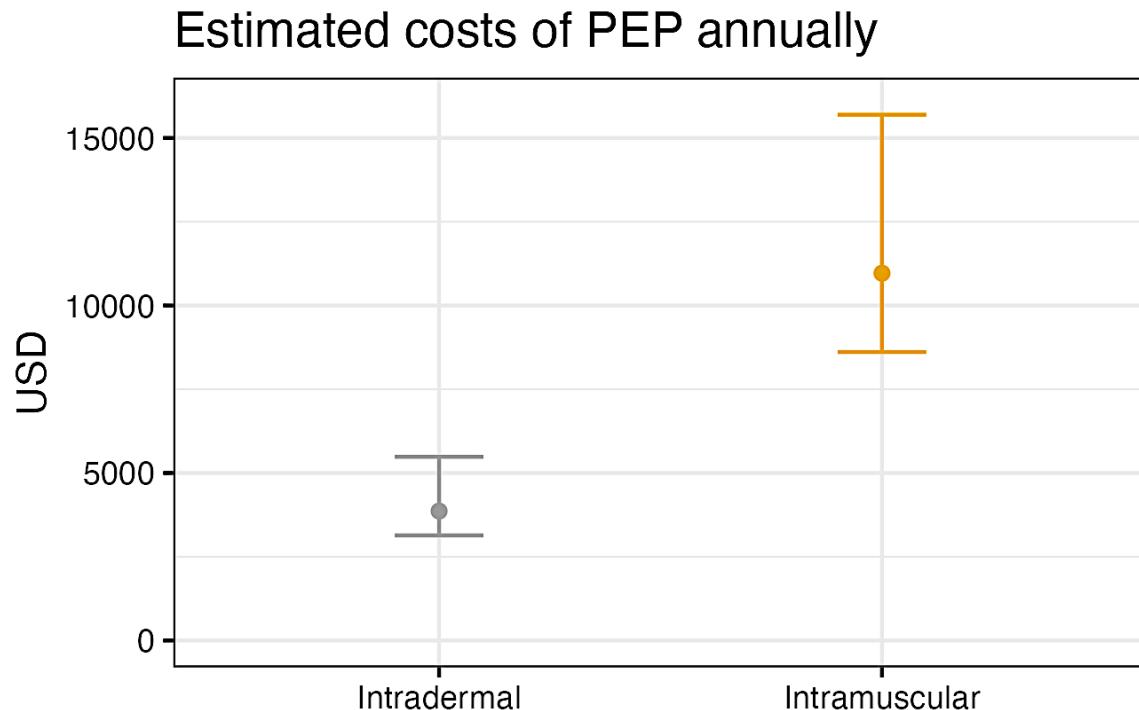
1. Intradermal vaccines are cost-saving



Intramuscular (IM)
1 ml per injection



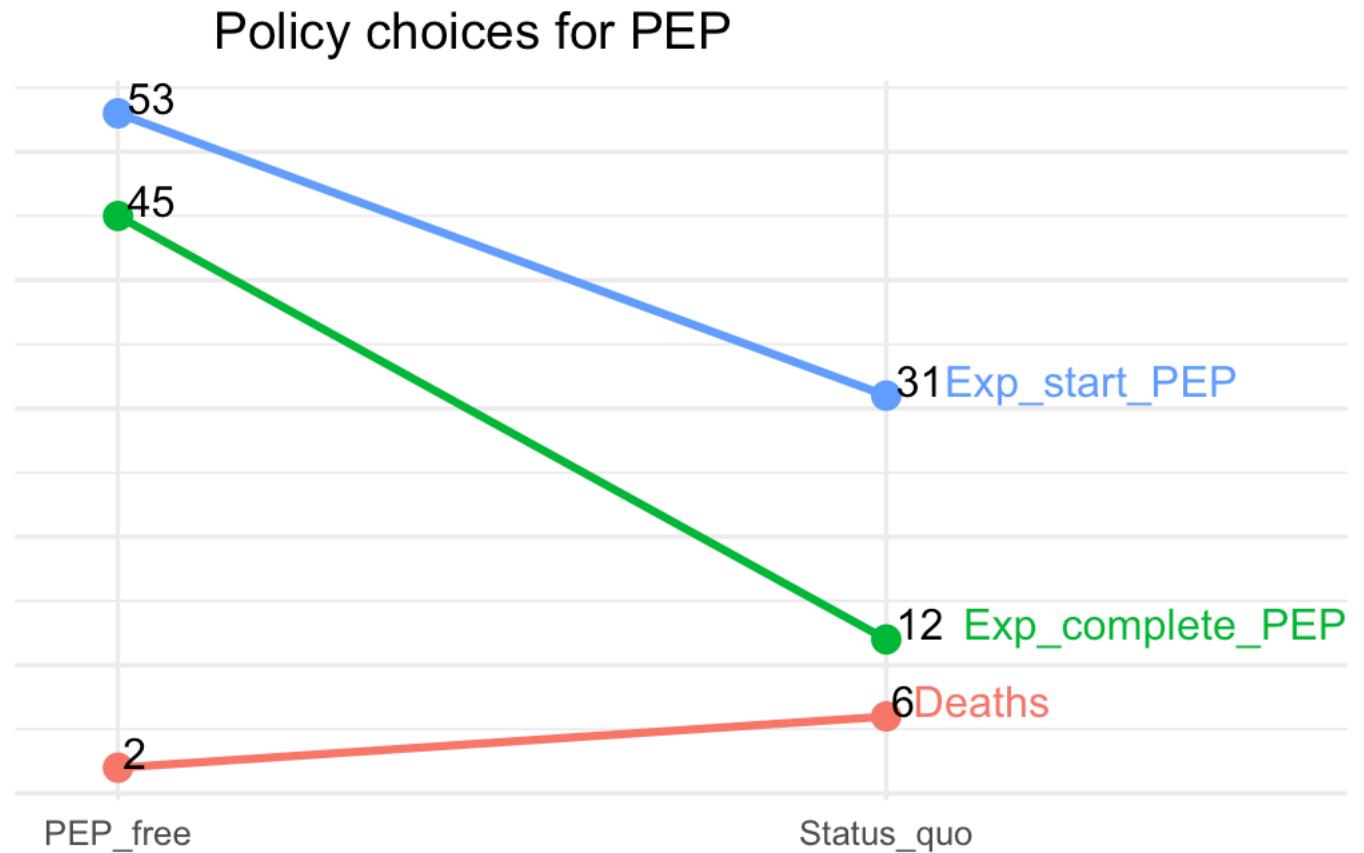
Intradermal (ID)
0.1 ml per injection



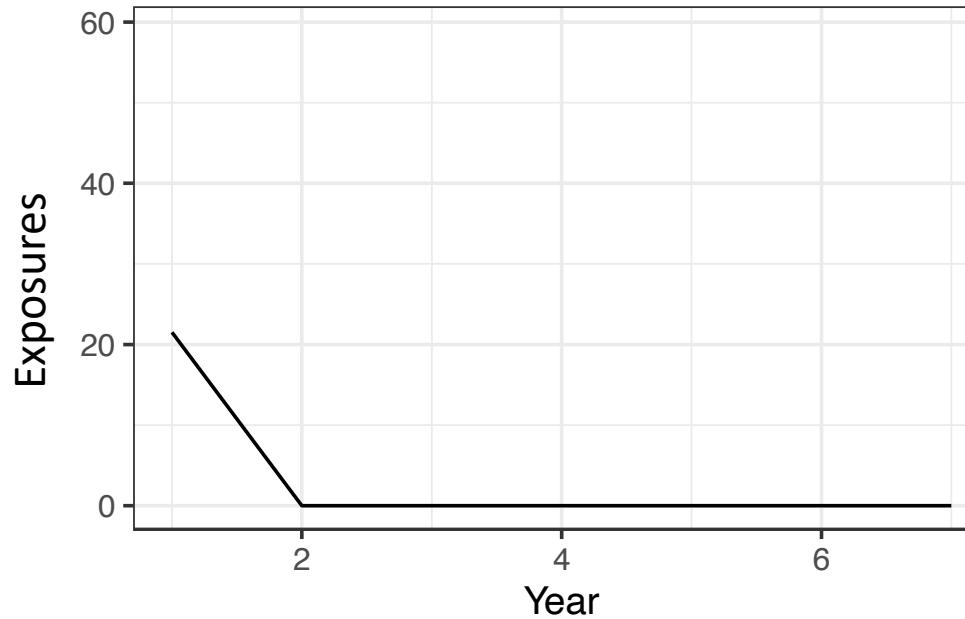
- Economic impacts of ID vs IM PEP admin in Pemba island.
- ID admin allows for vial sharing, making it potentially cost-effective

2. Free vaccines improve health seeking

- With free PEP, more people seek care, initiate and complete PEP after an exposure



3. MDV is effective in reducing high risk bites



- Time-series predictions of human exposures in Pemba island over a 7-year period, given 70% MDV implementation
- Implementing MDV following an introduction results in decline of rabies cases in 3-7 years

Decision tree model

Next steps:

- Refine functions
- Package this into an interactive online app
 - ✓ researchers
 - ✓ stakeholders
- Framework for different settings



bit.ly/3rWcMqm

Web interface for planning IBCM implementation

Rabies Control Method

Select the desired rabies control method.

Select Campaign Type

No Interventions

Show Healthy Dogs and Patients

Years

Select the number of years you would like to examine.

Years

7

Population Inputs

Input the human population and the Human Dog Ratio. This is used to calculate the estimated dog population.

Human Population

350000

Human Dog Ratio

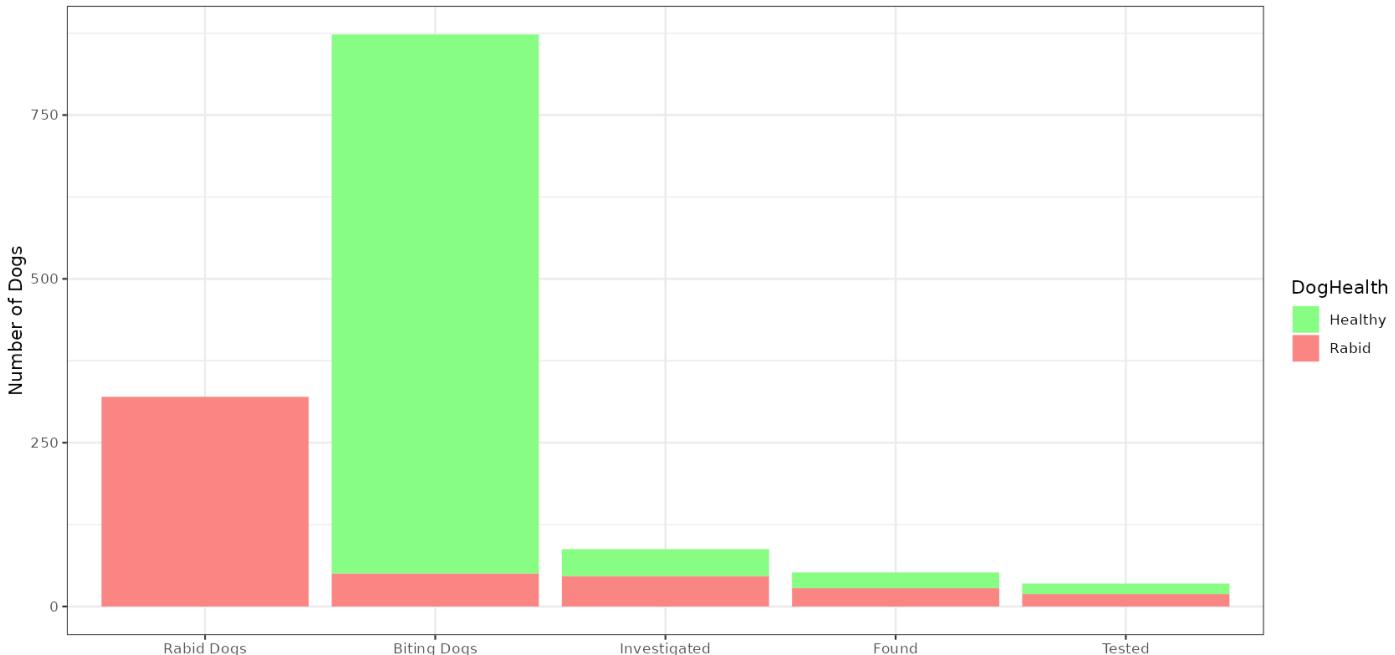
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IBCM Campaign

This page is designed to help plan and compare different methods of rabies control over several years.

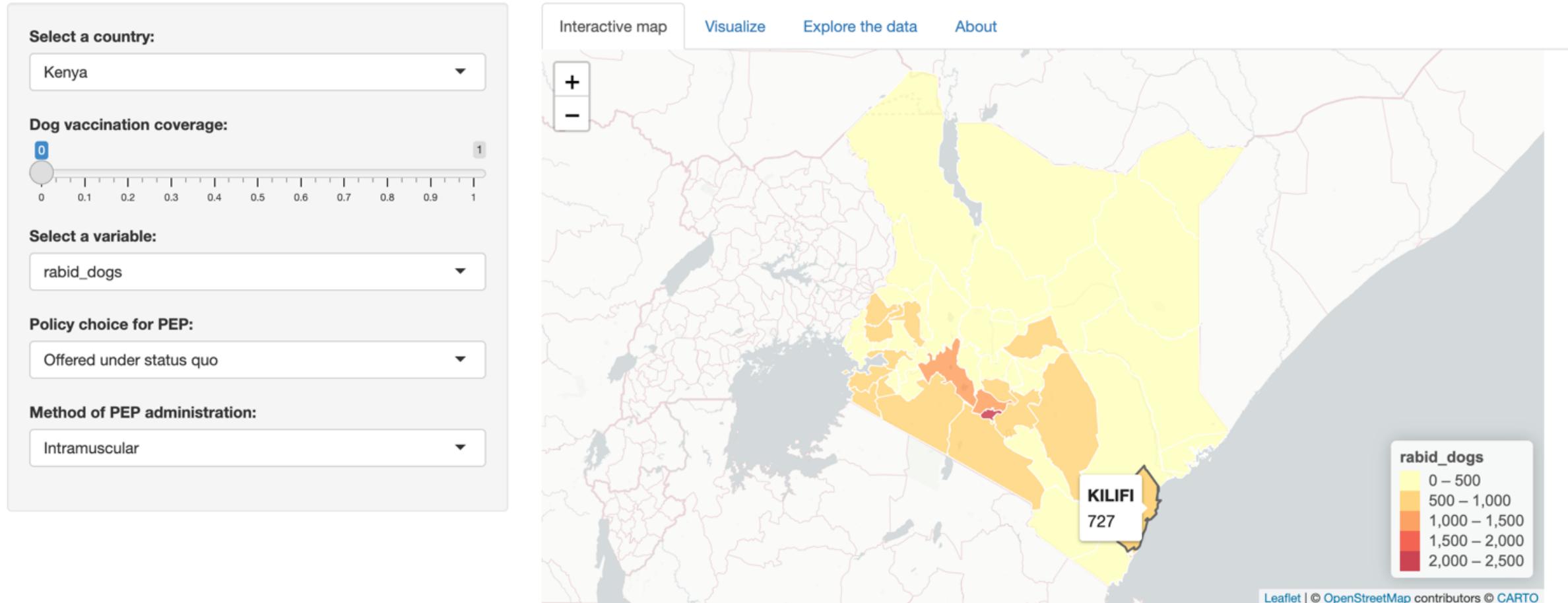
Dogs

Over the 7 years, there will be approximately 320 rabid dogs. Of these dogs, approximately 51 will go on to bite someone. Of these biting dogs, an estimated 47 will be investigated by a member of the IBCM team. Not all investigated dogs will be found, with an estimated 28 being found, and of these 19 being testable. Inevitably, some healthy dogs will end up being tested as well. This equates to approximately 41 healthy dogs being investigated by a member of the IBCM team. Of these, an estimated 24 healthy dogs being found, and 16 being tested. This results in a total of 88 investigations, and 35 dogs being tested.

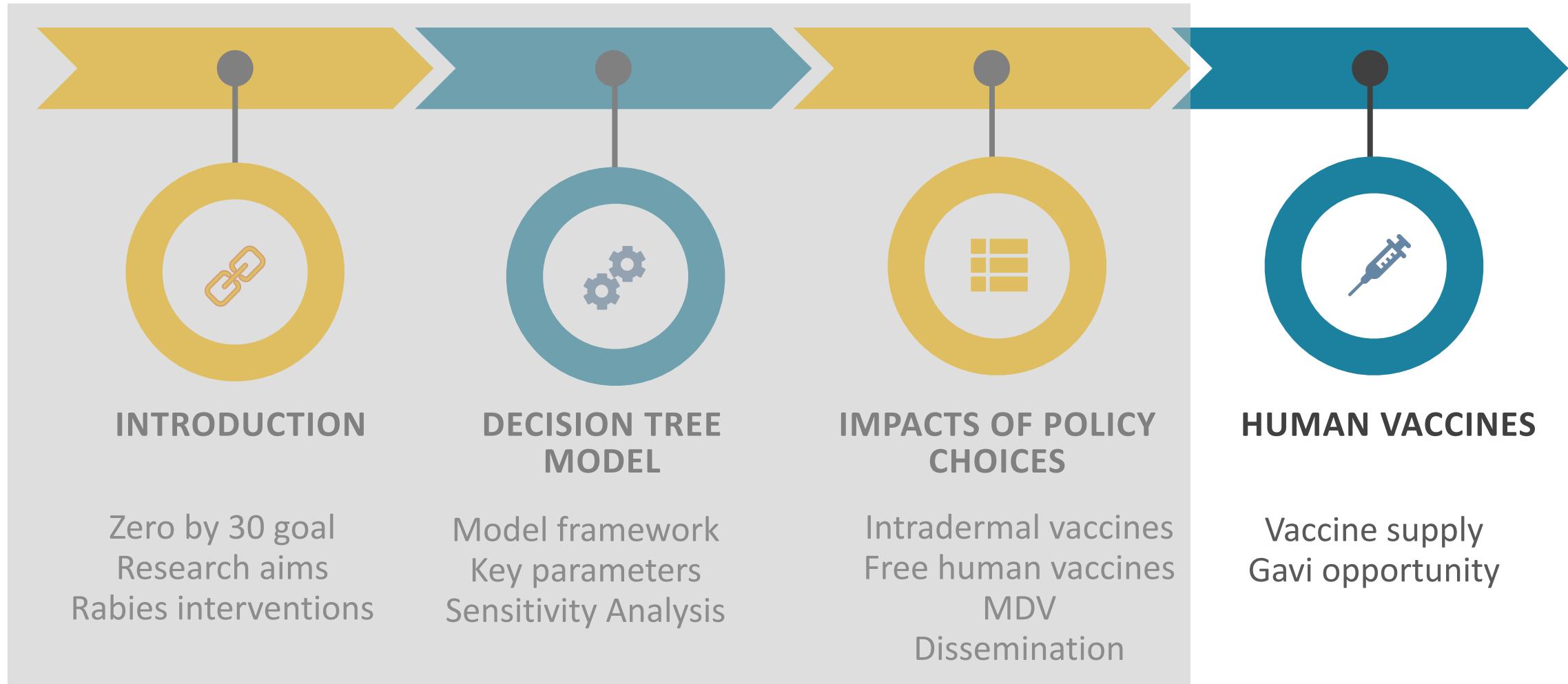


Dashboard for forecasting policy impacts

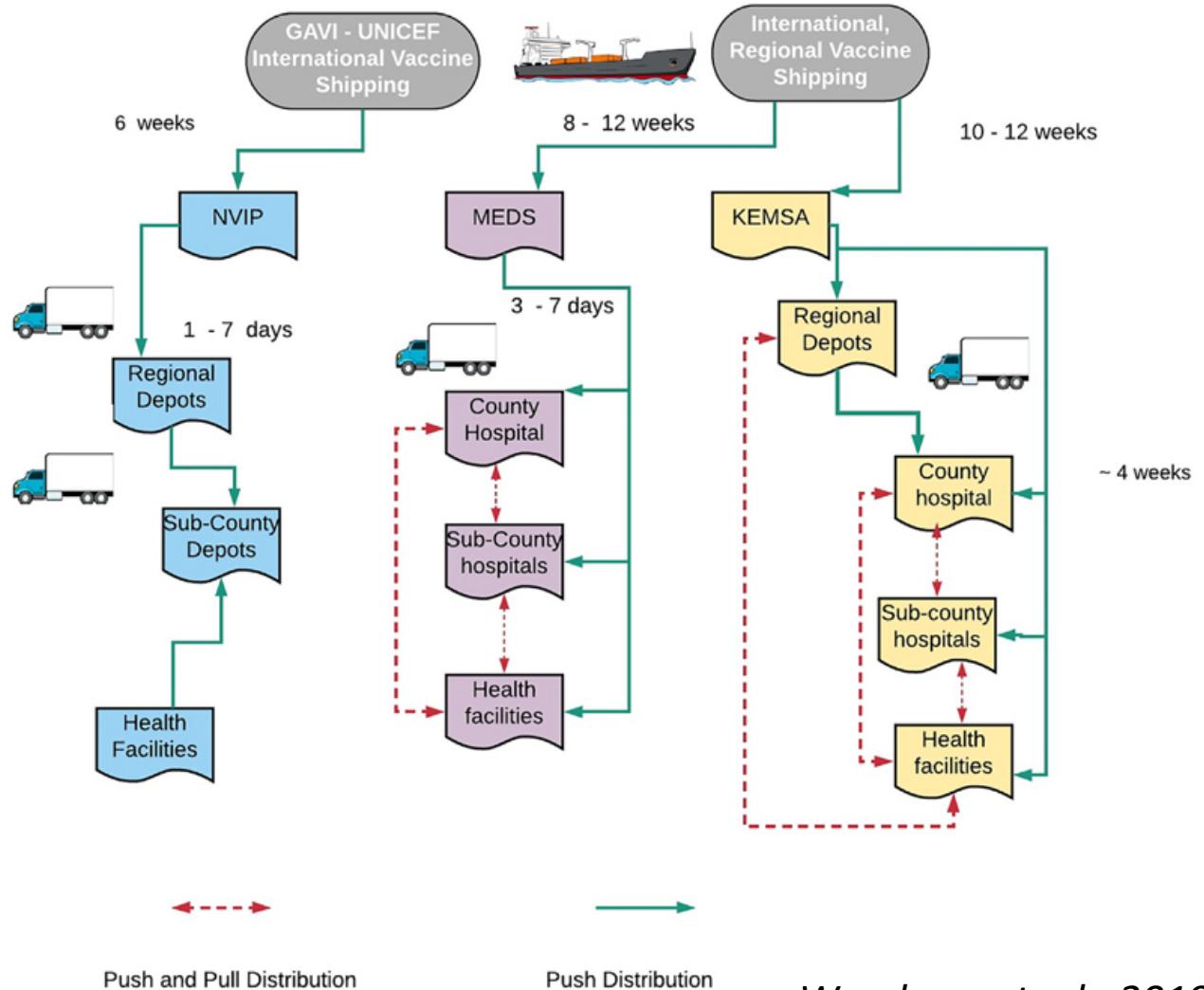
A framework to inform rabies policy in East Africa



Roadmap

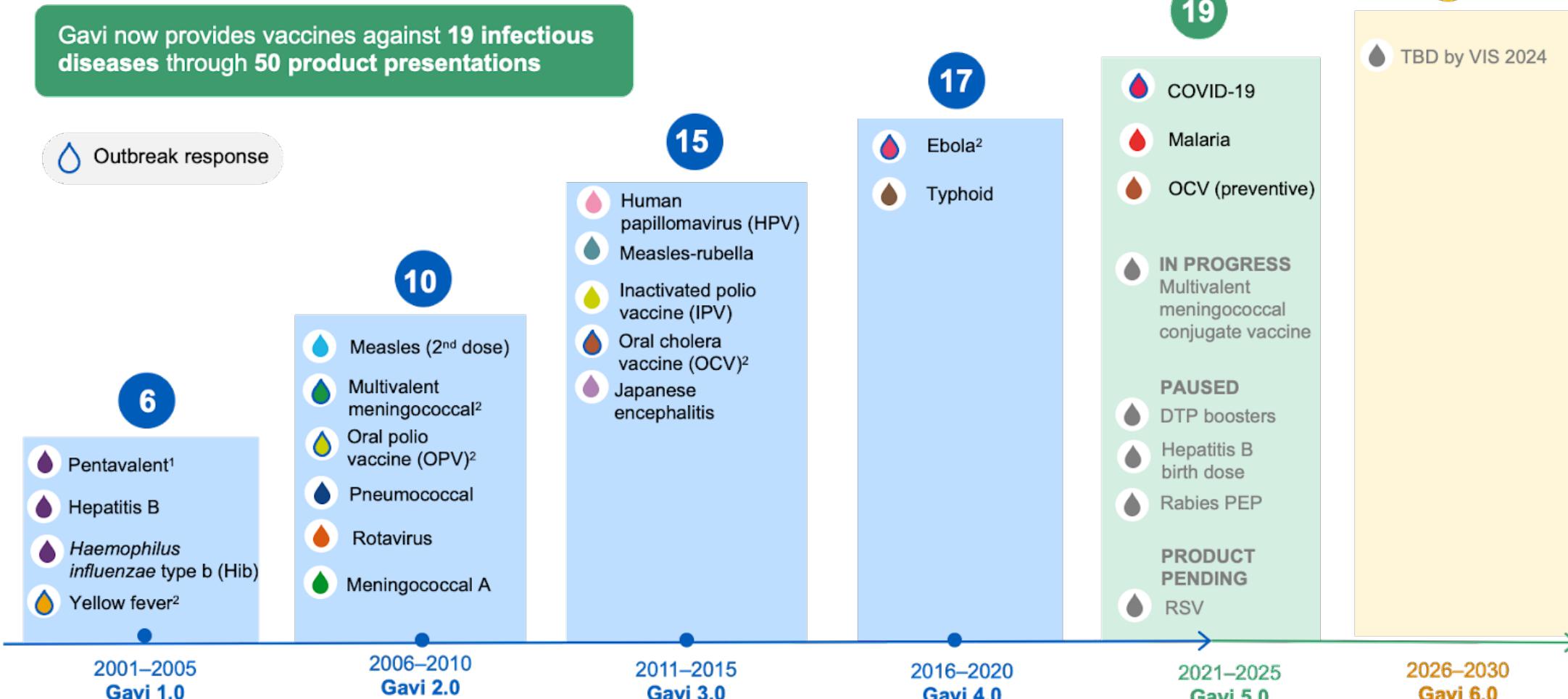


Human vaccine supply chain



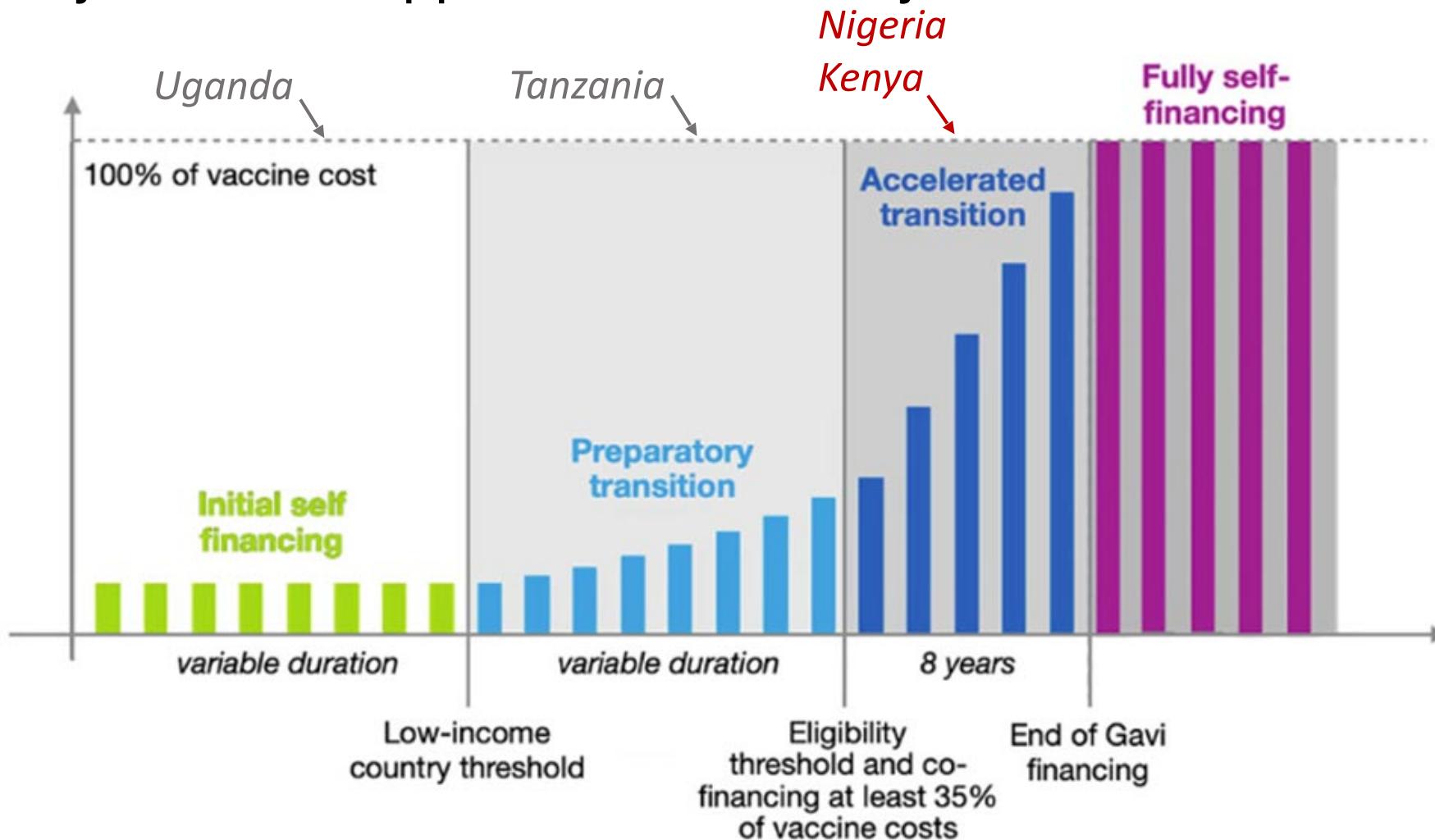
- Rabies currently not part of the expanded program on immunization (EPI)
- Delays in procurement therefore vaccine stockouts
- Modelling approaches:
 - ✓ Understand the implications of stocking at different levels
 - ✓ Quantify appropriate minimum stock thresholds

Gavi's portfolio has grown over time & added rabies PEP from 2021



Gavi eligibility

- Eligibility for Gavi support determined by countries' national income



The conversation is happening...

Research Evidence for Policy



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ifi IFAKARA **HEALTH INSTITUTE**
research | training | services

Controlling rabies and saving lives through One Health collaboration in **Tanzania**



KEY MESSAGES:

- Tanzania has a unique opportunity to drive One Health leadership in Africa by becoming an early adopter of Gavi-supported rabies post-exposure vaccines
- Every year rabies kills 350-800 Tanzanians. Communities are traumatised and households are financially ruined. Gavi support can halve these deaths in just three years.
- Mass dog vaccination can control rabies in dogs (and wildlife), but dog vaccination

The conversation is happening...



Forecasting and Optimising Rabies Vaccine Supply Chains for Endemic Regions – A Case Study of Kenya

Background

Rabies, a preventable yet fatal zoonotic disease ¹, remains a significant public health challenge in Kenya. Rabies is endemic and claims approximately 500 lives annually in the country ². As part of the global ‘Zero by 30’ initiative ³, Kenya recognises the crucial role of post-exposure prophylaxis (PEP) and mass dog vaccination in combating this disease ⁴. Bite victims need to access critical post-exposure vaccines to avert rabies, and their health-seeking behaviour is intrinsically linked to existing policies and practices ⁵.



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Three years:

- Mass dog vaccination can control rabies in dogs (and wildlife, but dog vaccination

Nigeria?

Summary

- Understanding of the key determinants underlying rabies burden has improved considerably
 - ✓ MDV single most effective approach to achieve zero human cases
 - ✓ Free PEP will result in increased healthcare - seeking
 - ✓ PEP alone cannot achieve zero human deaths – crucial in areas with high incidence
- Countries have the opportunity to take advantage of Gavi's investment
- Addressing the objectives of this study will
 - ✓ Inform stakeholders on the incremental cost effectiveness of different interventions
 - ✓ Support stakeholders to create a framework to achieve & maintain human rabies freedom

Thank you 😎



University
of Glasgow



m.luka.1@research.gla.ac.uk
[@martha_mawia](https://twitter.com/martha_mawia)