

# Roadmap for Rabies Elimination from Africa

Hiver Boussini<sup>1</sup>, Jakob Zinsstag<sup>2,3</sup>, Rolande Mindekem<sup>4</sup>, Monique Léchenne<sup>2,3</sup>,  
Stephanie Mauti<sup>2,3</sup>, Artemiy Dimov<sup>2,3</sup>, Vessaly Kallo<sup>5</sup>, Garmie Voupawoe<sup>6</sup>, Abakar  
Goukouni<sup>7</sup>, Boubacar Kanoute<sup>8</sup>, Charles Bodjo<sup>9</sup>, Madi Savadogo<sup>10,11,12</sup>; Abdallah  
Traoré<sup>13</sup>, Bassirou Bonfoh<sup>14</sup>, Mahamat Fayiz Abakar<sup>15</sup>, Huyam Salih<sup>16</sup>,

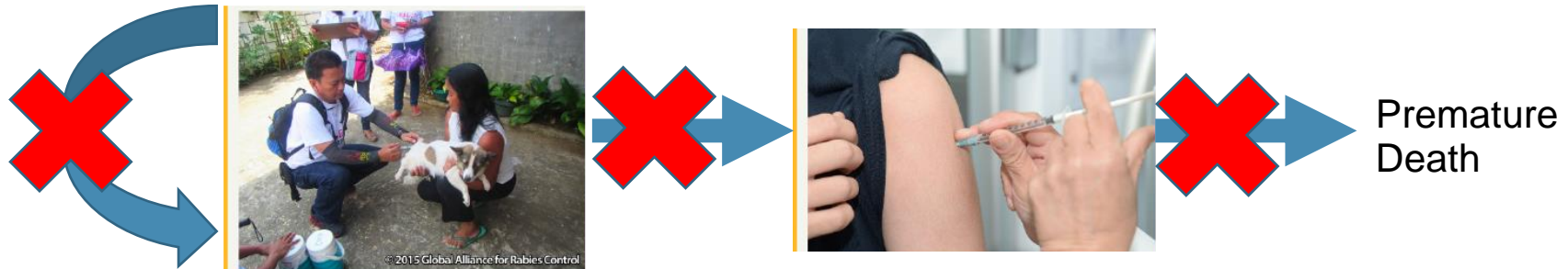
- 1 African Union – Inter-african Bureau for Animal Resources, Westlands road, PO Box 30786-00100, Nairobi, Kenya
- 2 Swiss Tropical and Public Health Institute, Kreuzstr. 2, CH-4123 Allschwil, Switzerland,
- 3 University of Basel, Petersplatz 3, CH-4003 Basel, Switzerland,
- 4 Ministère de Santé Publique, Ndjaména, Chad,
- 5 CVO Côte d'Ivoire, Direction des Services Vétérinaire, Ministère de l'Elevage et des Ressources Halieutiques, Abidjan, Côte d'Ivoire
- 6CVO Liberia, Ministry of Livestock, Monrovia, Liberia
- 7CVO Chad, Direction Générale des Services Vétérinaires, Ministère de l'Elevage et de la Production Animale, BP ; 750 N'Djaména, Tchad
- 8CVO Mali, Direction des Services Vétérinaires, Ministère de l'Elevage, Bamako Mali
- 9Director AU-PANVAC, African Union – Pan African Veterinary Vaccine Centre, PO Box 1746 Debre Zeit, Ethiopia
- 10Direction Générale des Service Vétérinaires, 03 BP 7023 Ouagadougou, Burkina Faso
- 11 Institut de Recherche en Sciences de la Santé (IRSS/CNRST), 03 BP 7192, Ouagadougou 03, Burkina Faso
- 12 Rabies Free Burkina Faso, 03 BP 7192, Ouagadougou 03, Burkina Faso
- 13Laboratoire Centrale Vétérinaire, Bamako, Mali
- 14Centre Suisse de Recherches Scientifiques en Côte d'Ivoire, 01 BP 1303, Abidjan 01, Côte d'Ivoire
- 15Institut de Recherches en Elevage pour le Développement, N'Djaména, Chad
- 16Director AU-IBAR, African Union – Inter-African Bureau for Animal Resources, Westland's road, PO Box 30786-00100, Nairobi, Kenya

# Background

- Previous research suggests that dog mass vaccination campaigns can eliminate rabies locally, saving human and animal lives. Despite these demonstrated benefits, dog vaccination programs remain scarce on the African continent.
- How can the goal of zero dog mediated human rabies death by 2030 be reached in Africa?
- AVI's rabies vaccine investment strategy (GAVI VIS) aims at universal coverage with post-exposure prophylaxis (PEP) for eligible countries, but this will not interrupt human exposure from rabies suspected animals unless it is coupled with a Pan African mass dog vaccination (MDV) strategy.

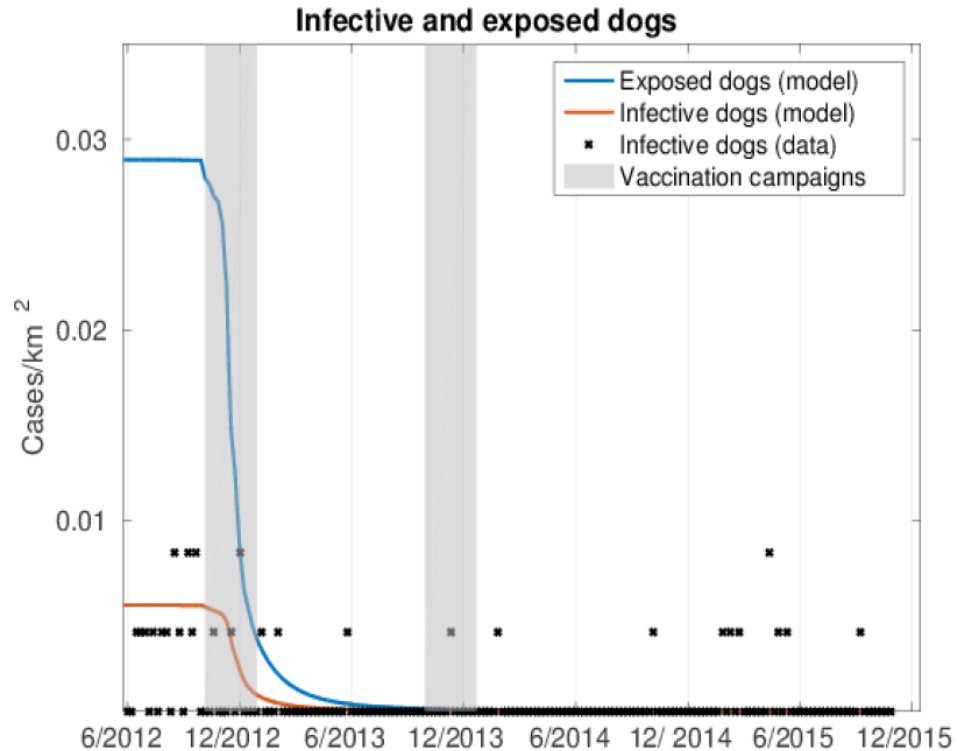
## Comparison of different intervention strategies

- Strategy 1: Protecting humans with post-exposure prophylaxis (PEP) prevents human death
- Strategy 2: Dog mass vaccination NOT coordinated between African countries
- Strategy 3: Coordinated Dog mass vaccination, requiring high level of coordination between national governments,

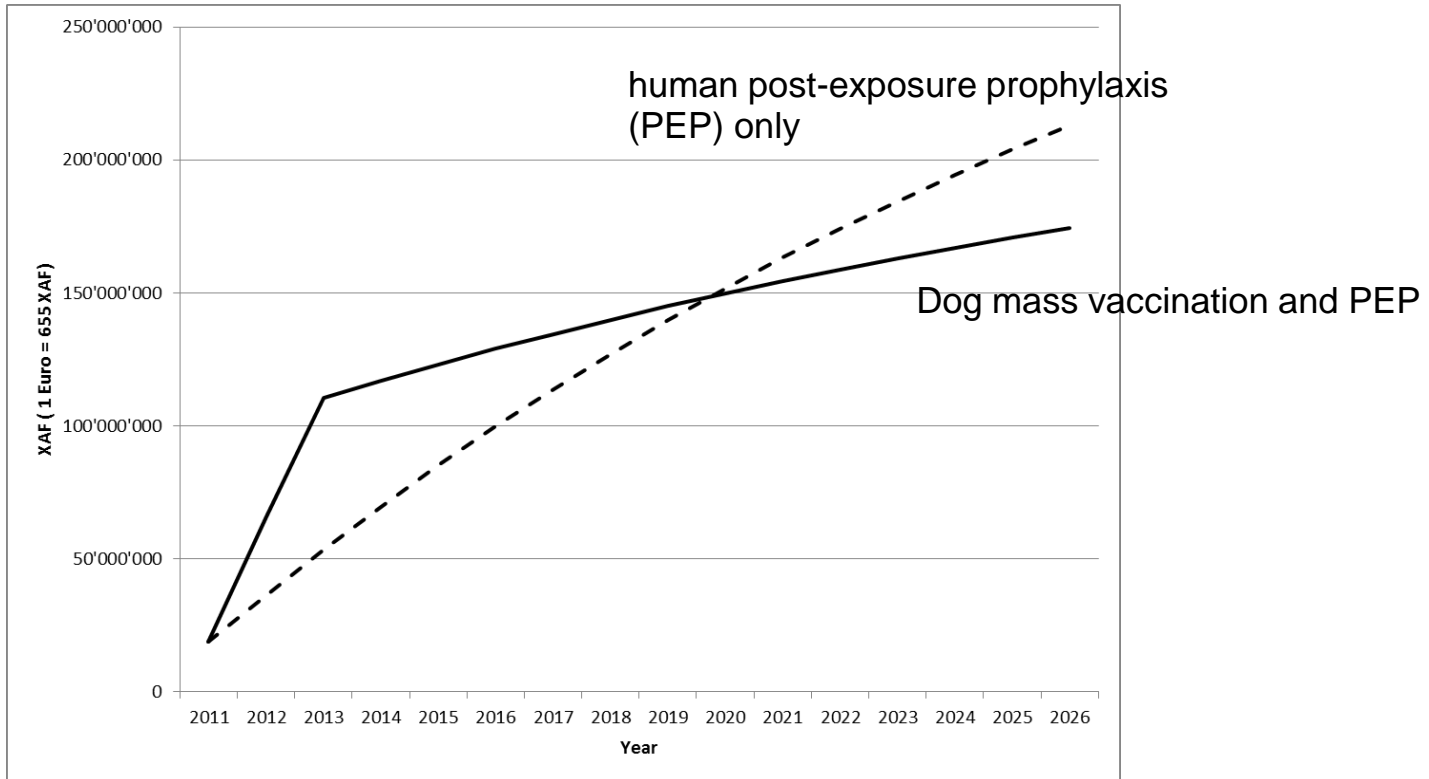




# Mass dog vaccination in N'Djamena, Chad



- Cumulative cost of rabies control in an African city (Mindekem et al. 2018)



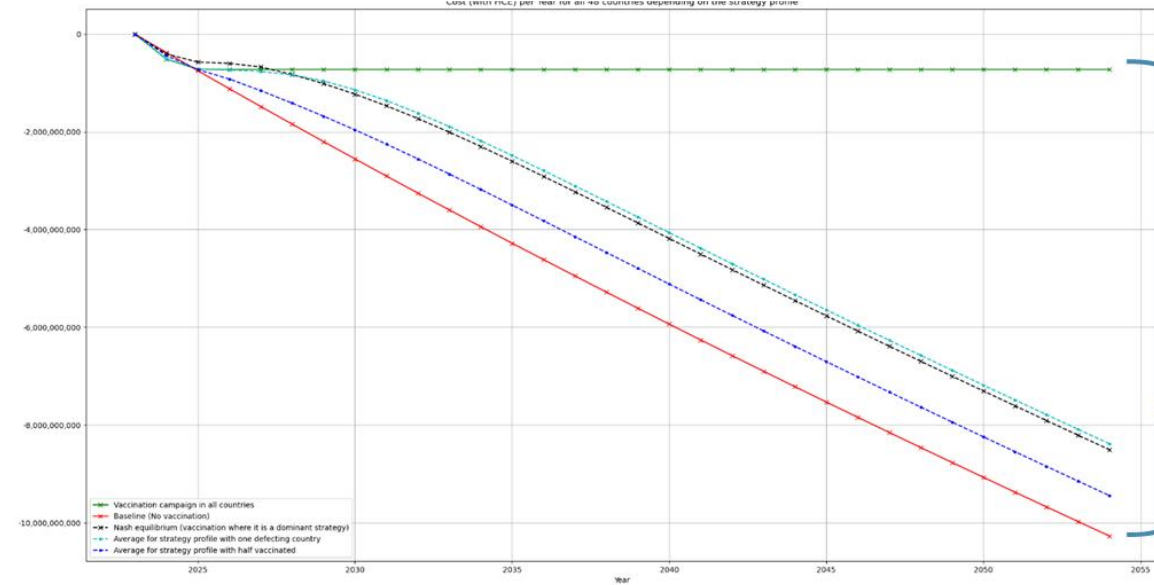
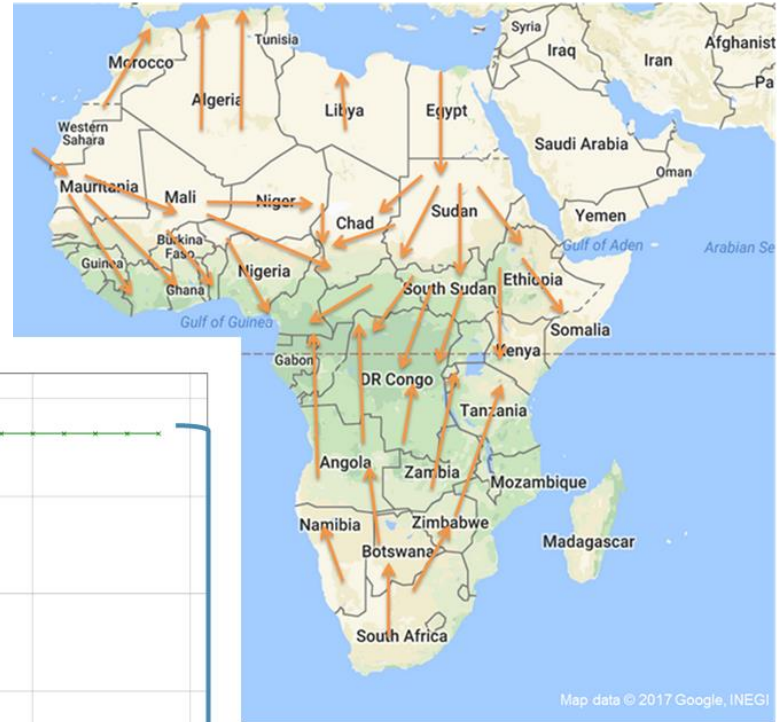




Article <https://doi.org/10.1038/s41467-023-41110-2>

# Benefit-cost analysis of coordinated strategies for control of rabies in Africa

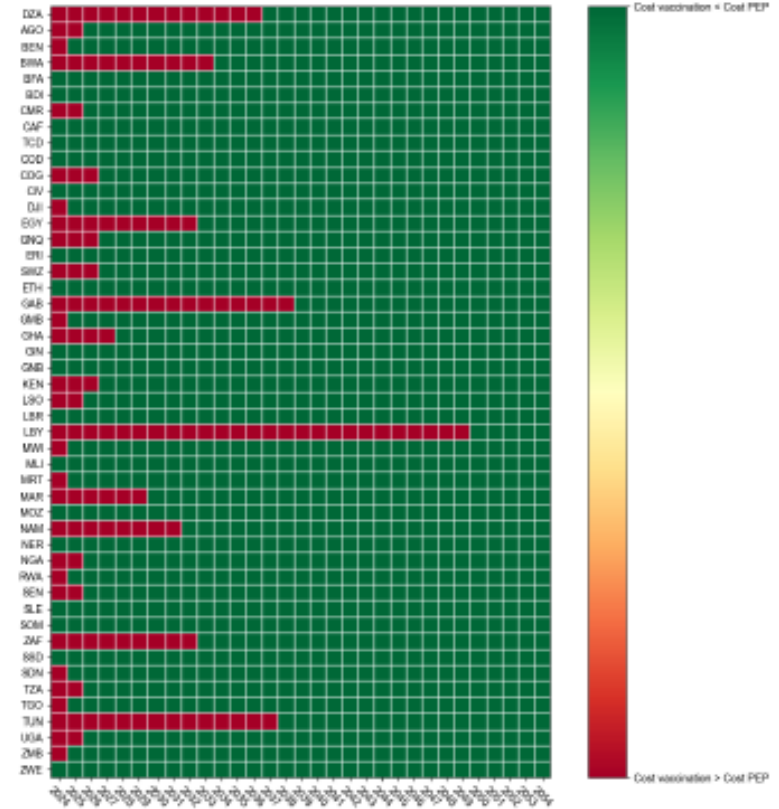
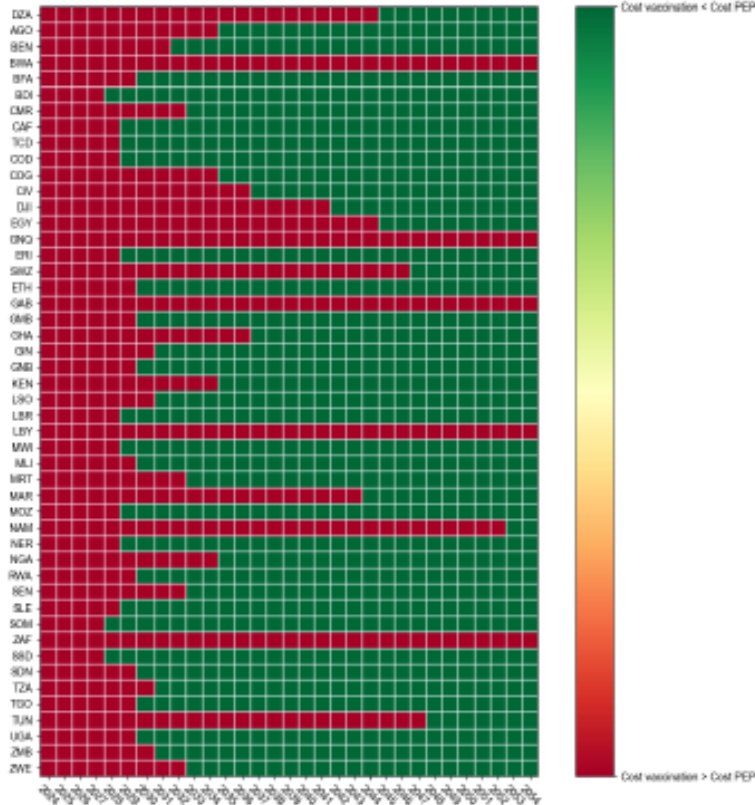
Received: 20 May 2023  
Accepted: 22 August 2023  
A. Bucher<sup>1,2,5</sup>, A. Dimov<sup>1,2,3,5</sup>, G. Fink<sup>1,2</sup>, N. Chitnis<sup>1,2</sup>, B. Bonfoh<sup>4</sup> & J. Zinsstag<sup>1,2</sup> ✉





Cumulated human capital benefit (GDP) 2024-2054 >10 Billion USD

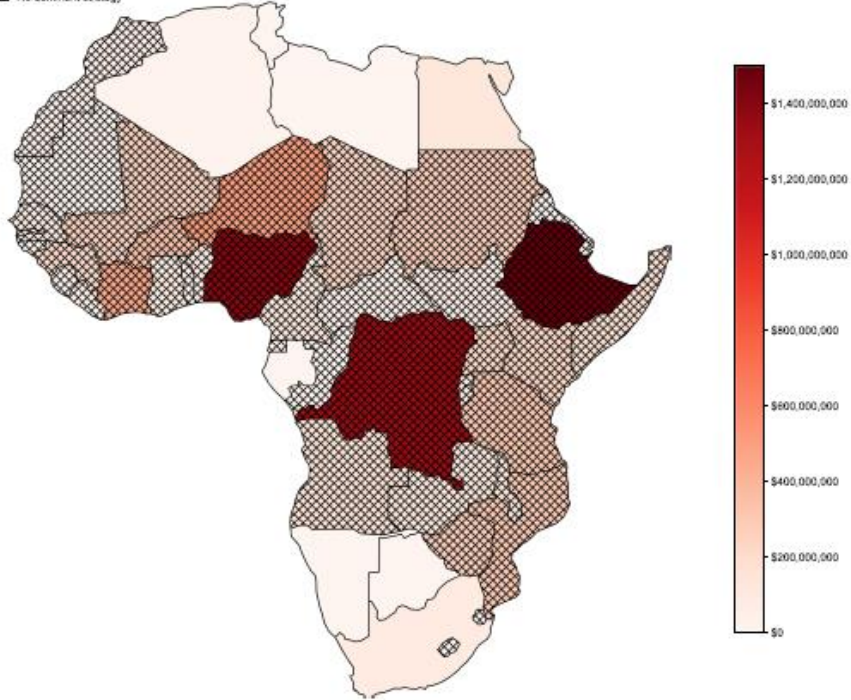


# Break-even of Post-exposure Prophylaxis and dog mass vaccination without and with Human capital effect

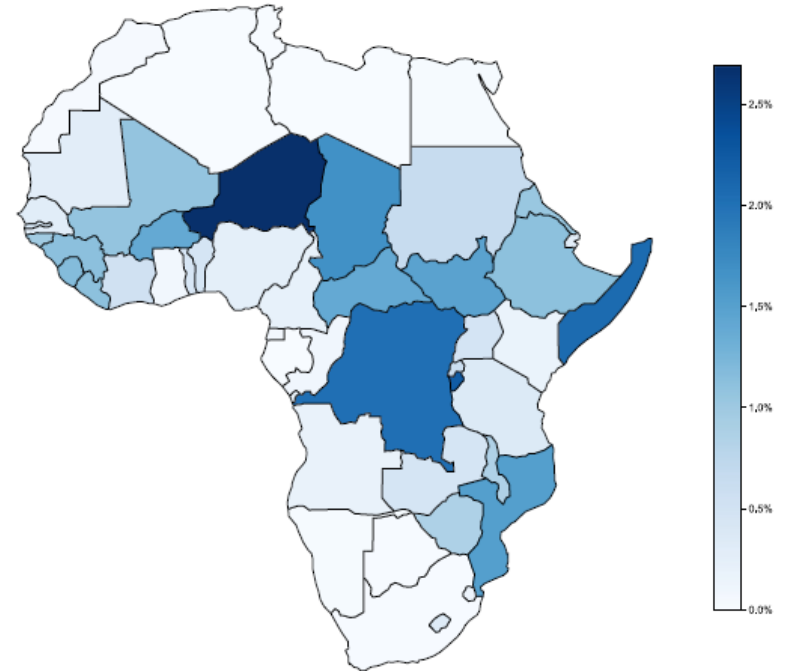


# GDP gain in USD and in proportion

 Vaccination as dominant strategy  
 No dominant strategy



Gains in % of the GDP from the cooperation for mass dog vaccination



# Summary of the results of the Benefit-Cost analysis

- Strategy 3: coordinated mass dog vaccination (MDV) within and between countries together with PEP would lead to the elimination of dog rabies in Africa with total welfare gains of USD 9.5 billion (95% CI: 8.1 – 11.4 billion) between 2024 and 2054 (30 years).
- A coordinated MDV is highly profitable with a return on investment (ROI) of 14/1 (Strategy 3 / Strategy 1). Welfare gains can reach up to 2.5% of the Gross domestic product (GDP).

# Towards a Pan-African Rabies Elimination Campaign

- Safe, effective, and affordable rabies vaccines for dogs, developed according to World Organization of Animal Health (WOAH) standards, are available.
- A roadmap on to elimination addresses coordination, political consensus, financing, communication, vaccine quality and pharmacovigilance, vaccine stock management, logistics, national campaign planning and, monitoring and evaluation is currently prepared under leadership of AU-IBAR in partnership with Africa CDC.