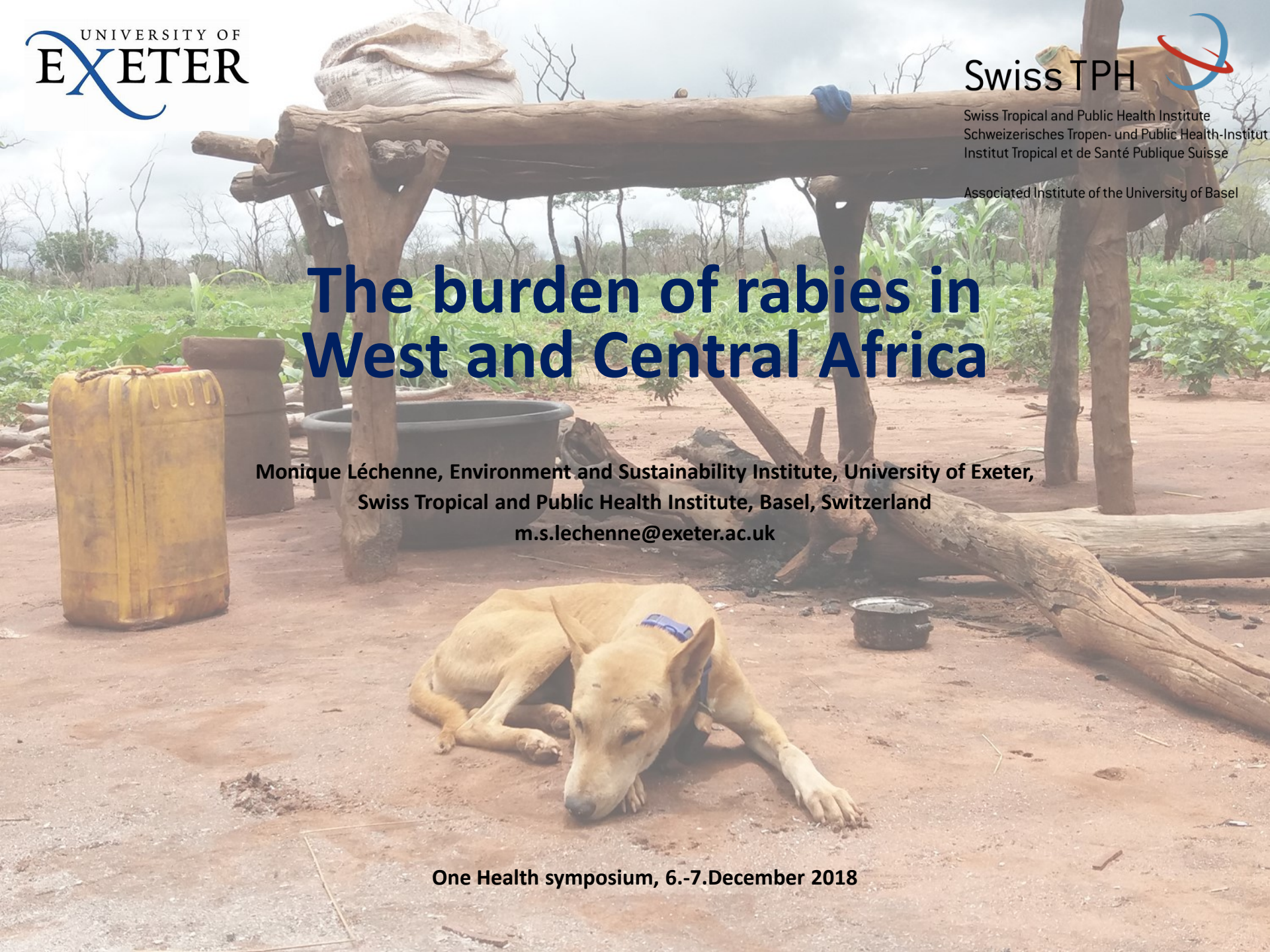


The burden of rabies in West and Central Africa

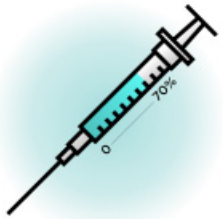
Monique Léchenne, Environment and Sustainability Institute, University of Exeter,
Swiss Tropical and Public Health Institute, Basel, Switzerland
m.s.lechenne@exeter.ac.uk

One Health symposium, 6.-7.December 2018

Every **09** minutes, a person dies from **RABIES.**

100% of human cases are **preventable.**

Domestic dogs cause over **99%** of human rabies deaths.



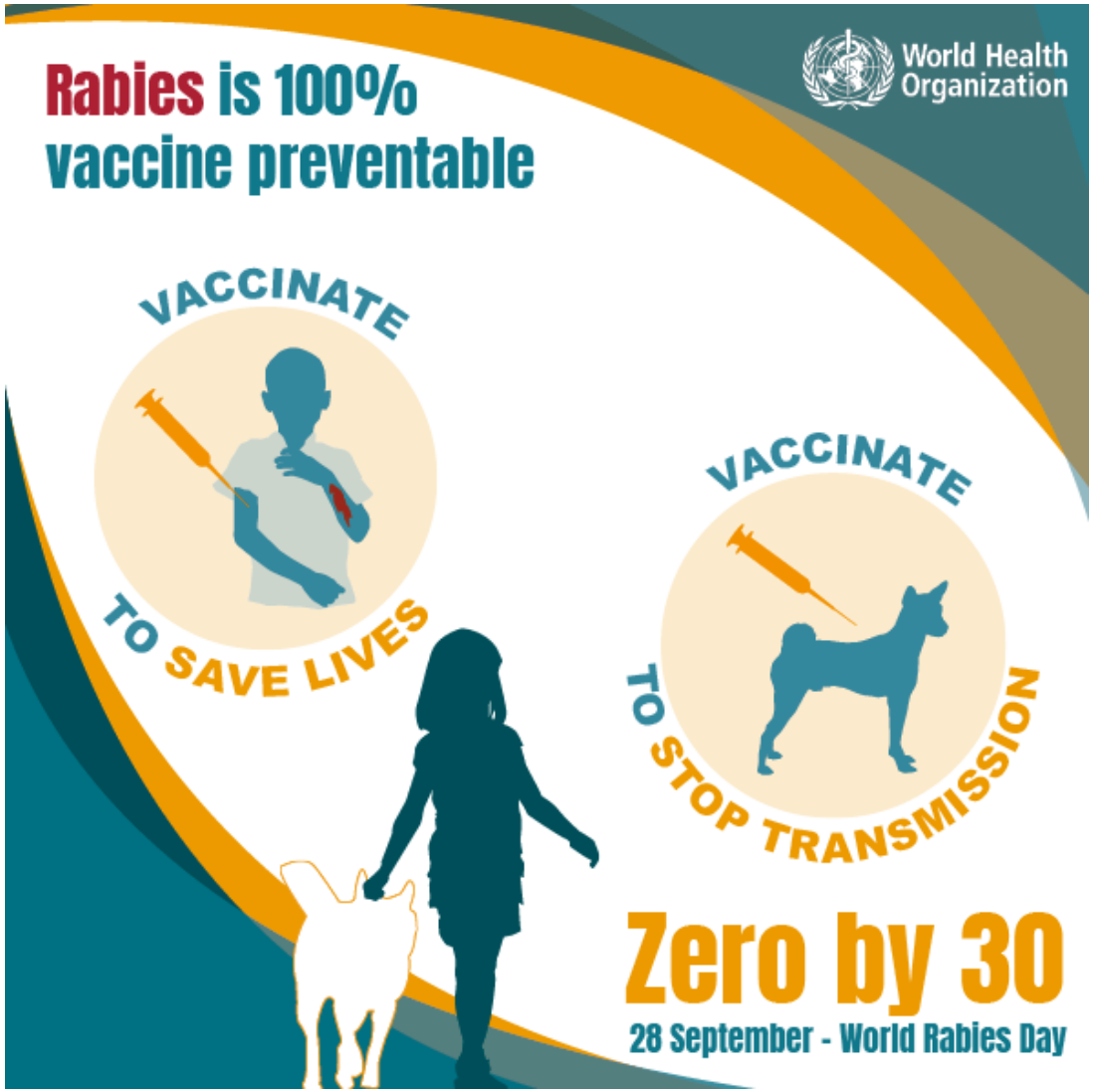
Vaccinating **70%** of dogs in at-risk areas can eliminate canine rabies.

Nearly **85%** of the world is at risk of contracting canine rabies.

95% of human rabies deaths occur in Africa and Asia.

Mass canine vaccination programmes reduced rabies by **90%** in Latin America.

©GARC, end rabies now factsheet



Access factors?

Vaccine demand?
(for animals and humans)

How many dogs?

How many bite cases?

How many exposures?

How many deaths?

Cost-efficiency of interventions?

Rabies surveillance situation in Africa

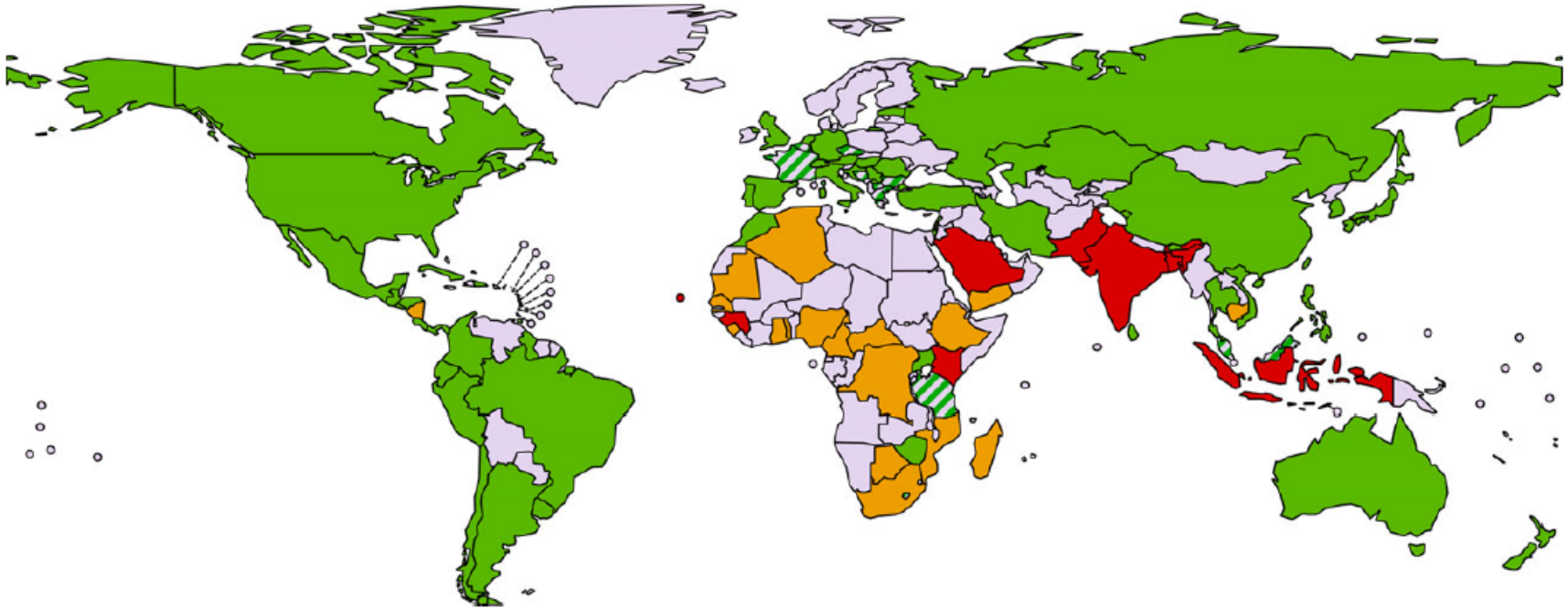


Fig. 2. The effectiveness of rabies surveillance globally. Legend: green = human rabies is notifiable and surveillance is effective; orange = human rabies is notifiable, but surveillance is ineffective; grey/green striped = human rabies is notifiable, but no information on effectiveness was supplied; red = human rabies is not notifiable; grey = no survey data available.

Taylor et al. 2015; Surveillance of Human Rabies by National Authorities – A Global Survey; Zoonoses and Public Health

Human rabies transmitted by dogs: current status of global data, 2015
published in January 2016 in WHO's Weekly Epidemiological Record.

African Region – Région africaine	A1	A2	B1	B2	B3	B4	C1	C2
Algeria – Algérie	7			7			22	67
Angola				91		151	185	458
Benin – Bénin				Unknown – Inconnu	7		178	47
Botswana				Unknown – Inconnu	0		3	2
Burkina Faso				21	8		880	305
Burundi				Unknown – Inconnu			550	278
Cameroon – Cameroun					4		196	203
Central African Republic – République centrafricaine				Unknown – Inconnu	8		227	48
Chad – Tchad				Unknown – Inconnu			64	861
Congo					5		20	18
Côte d'Ivoire				Unknown – Inconnu	15		569	412
Democratic Republic of the Congo – République démocratique du Congo				22	230		5 579	752

A) Official national reporting to WHO
B) National data officially displayed or reported elsewhere
C) Estimates from burden of disease modelling

→ **Disconnect between reported data and the actual incidence of rabies**

The GAVI learning agenda on rabies

Funding for improved data collection and modelling

- Data collection in 8 African and 6 Asian countries + Haiti
- Goal: Inform GAVI advisory board on a vaccine investment strategy!

Swiss TPH contribution:

- data from Mali, Chad, Côte d'Ivoire and Liberia
- part of the modelling consortium
- participation at WHO expert advisory meeting

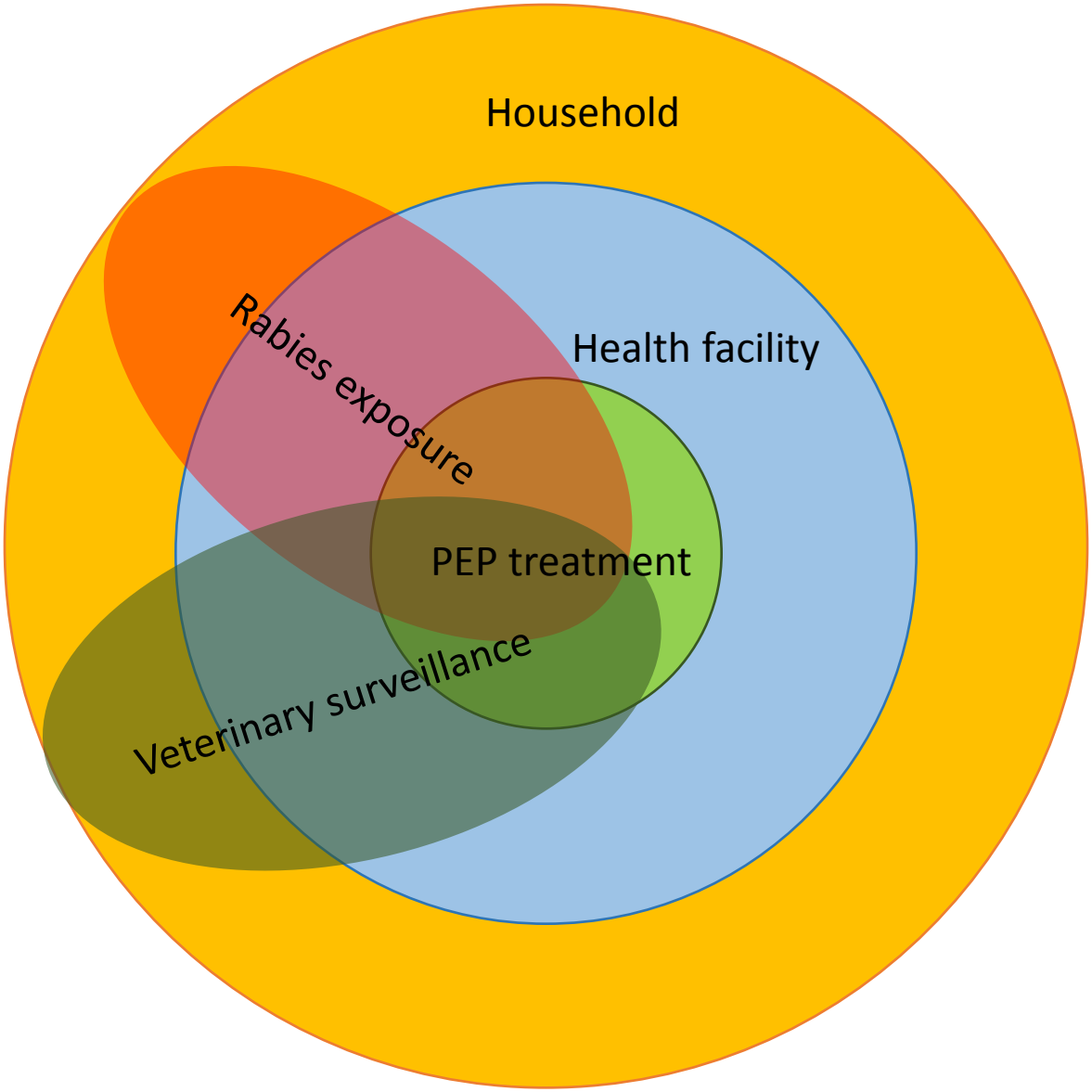
Swiss TPH core project partners:

Mali: Laboratoire Centrale Veterinaire (LCV), Dr. Abdallah Traore

Côte d'Ivoire: Centre Suisse de Recherche Scientifique (CSRS), Prof. Bassirou Bonfoh

Chad: Centre de Support en Santé International (CSSI), Dr. Daugla Doumagoum Moto

Institute de Recherche en Elevage pour le Developpement (IRED), Dr. Richard Ngandolo



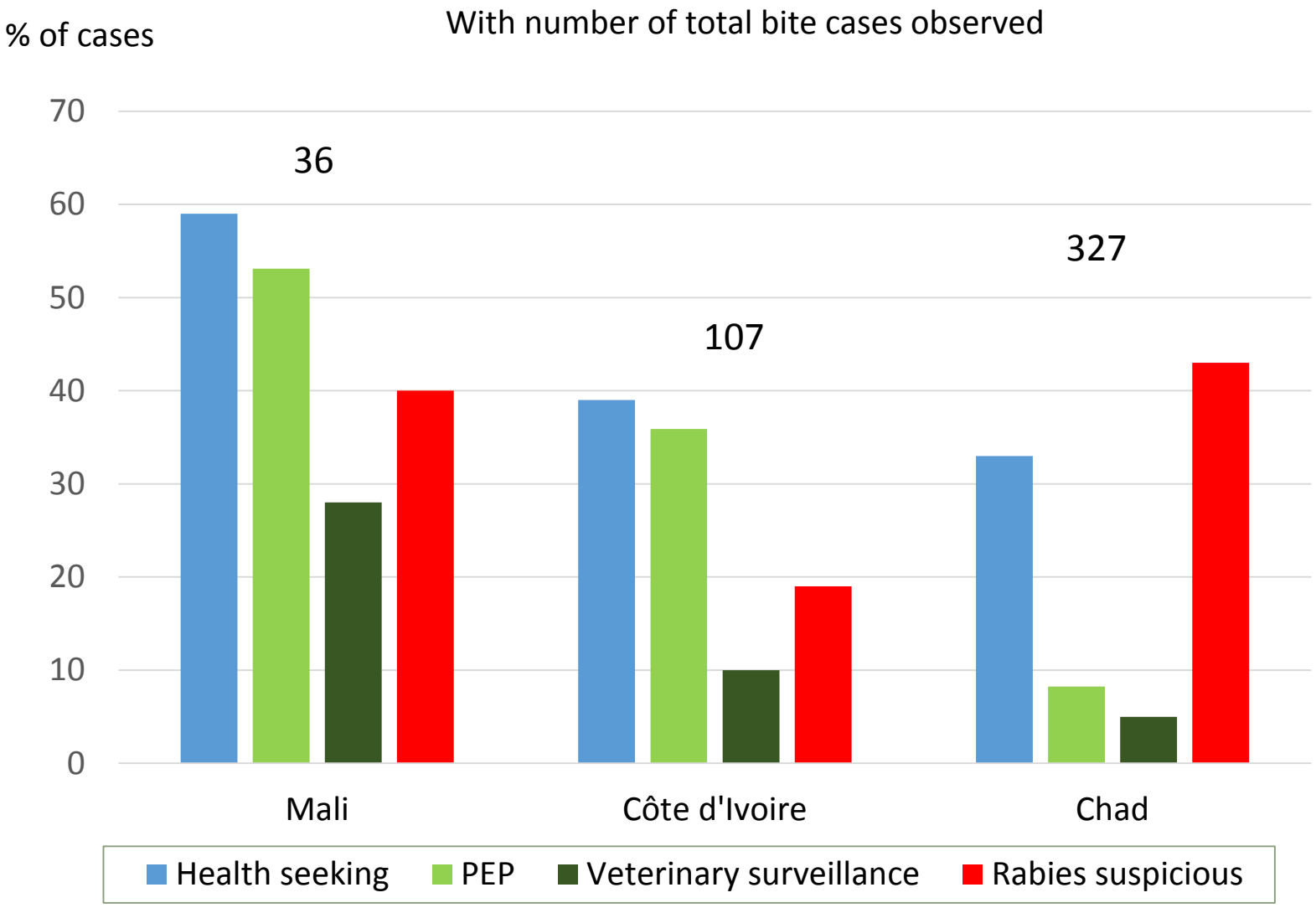
Data collection:

Cross-sectional household survey
2x phone follow-up (8000HH/country)

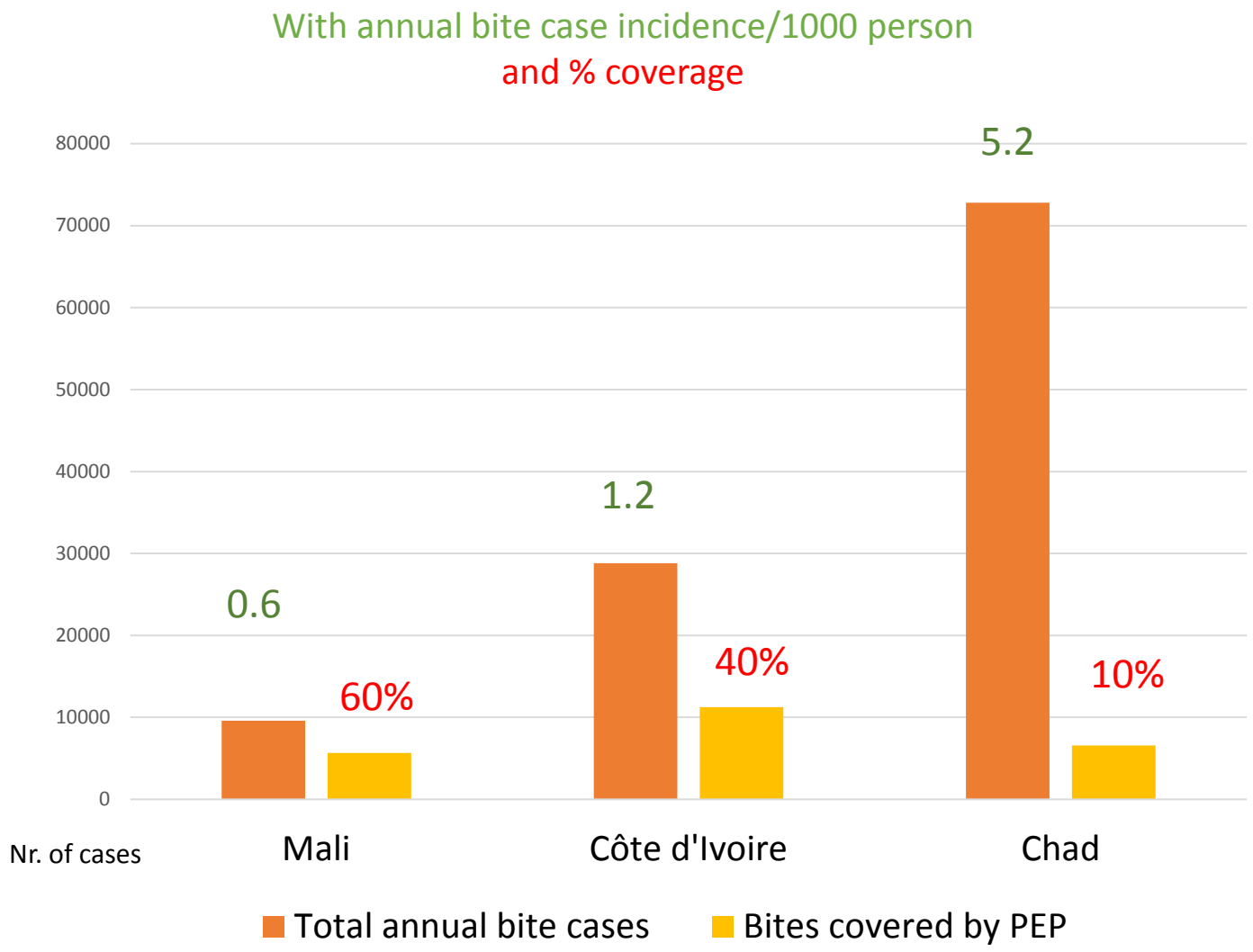
Longitudinal health facility study registering bite cases
- 1052 Chad
- 3367 Côte d'Ivoire
- 4010 Mali

Longitudinal animal surveillance study
- Chad: 175 positive of 191
- Mali: 57 positive of 67
- Côte d'Ivoire: 29 positive of >700 observations

Bite cases observed during the baseline household survey

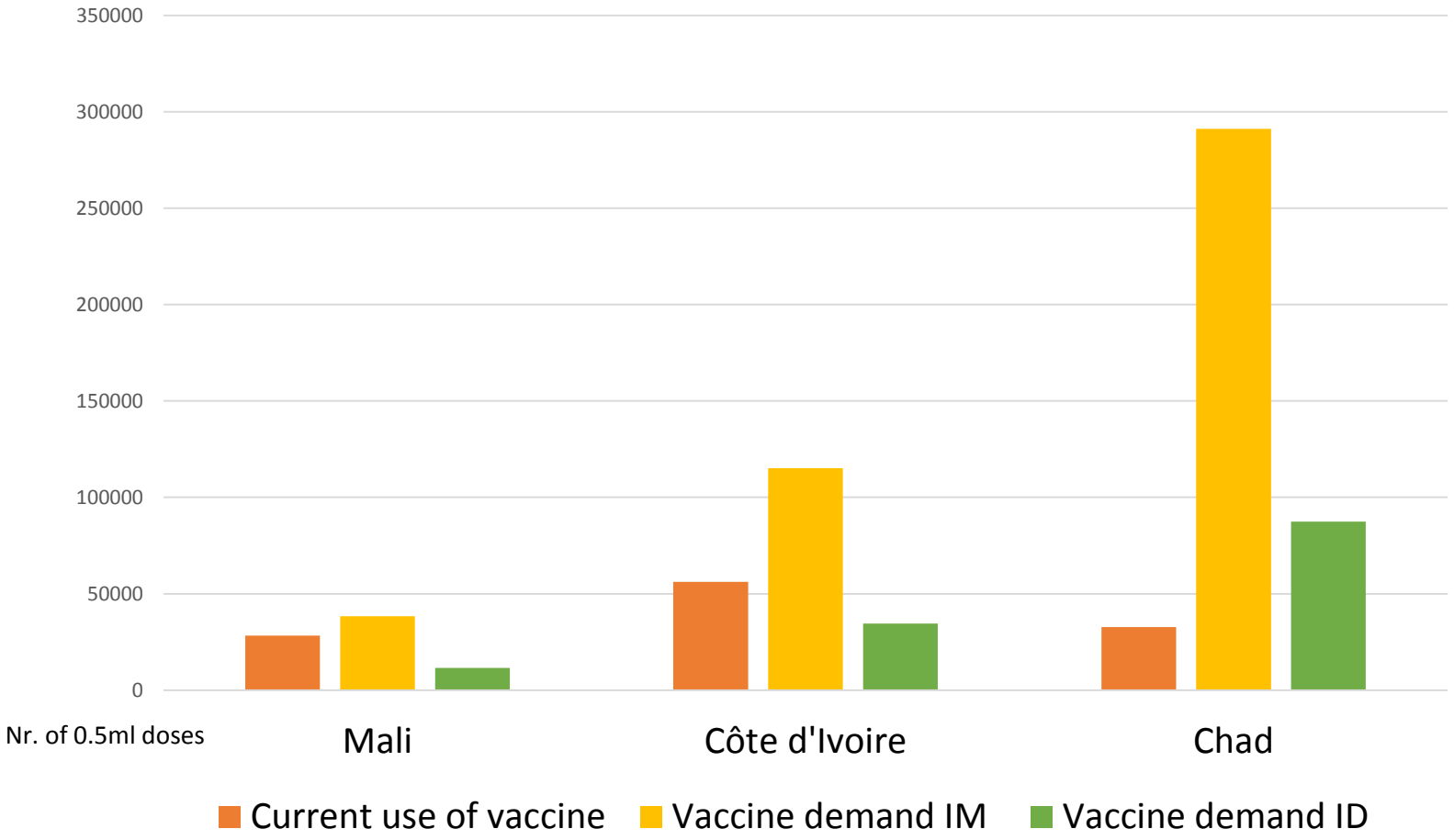


Estimation of national annual number of bite cases



Estimated vaccine demand compared to current use

Change to 3 dose ID schedule will bring a 60% demand reduction



The potential effect of improved provision of rabies post-exposure prophylaxis in Gavi-eligible countries: a modelling study

*WHO Rabies Modelling Consortium**

Summary

Background Tens of thousands of people die from dog-mediated rabies annually. Deaths can be prevented through post-exposure prophylaxis for people who have been bitten, and the disease eliminated through dog vaccination. Current post-exposure prophylaxis use saves many lives, but availability remains poor in many rabies-endemic countries due to high costs, poor access, and supply.

Methods We developed epidemiological and economic models to investigate the effect of an investment in post-exposure prophylaxis by Gavi, the Vaccine Alliance. We modelled post-exposure prophylaxis use according to the status quo, with improved access using WHO-recommended intradermal vaccination, with and without rabies immunoglobulin, and with and without dog vaccination. We took the health provider perspective, including only direct costs.

Lancet Infect Dis 2018

Published Online
November 21, 2018
http://dx.doi.org/10.1016/S1473-3099(18)30512-7

See Online/Comment
http://dx.doi.org/10.1016/S1473-3099(18)30606-6

*Contributors are listed in the appendix

- ✓ **Status quo: 1 million deaths occurring from 2020-2035**
- ✓ **Free access to PEP will potentially prevent 489’000 deaths**
- ✓ **With switch to 3 dose ID schedule vaccine demand will not increase**
- ✓ **Investment of $635 per death averted**

Anticipated challenges

Difference to other childhood vaccination schemes

→ demand for novel distribution strategies

→ availability at the right time at the right place!

Vaccine preposition currently not useful for ID injection

→ dose reduction per vial needed

→ different syringe and needle

Weak national health and veterinary systems

→ demand for infrastructure support

→ demand for staff training

Health seeking of bite victims

→ Awareness needs to be increased

→ Need for folllow-up to ensure compliance

Study contribution

Comparison of decentralized and centralized approaches

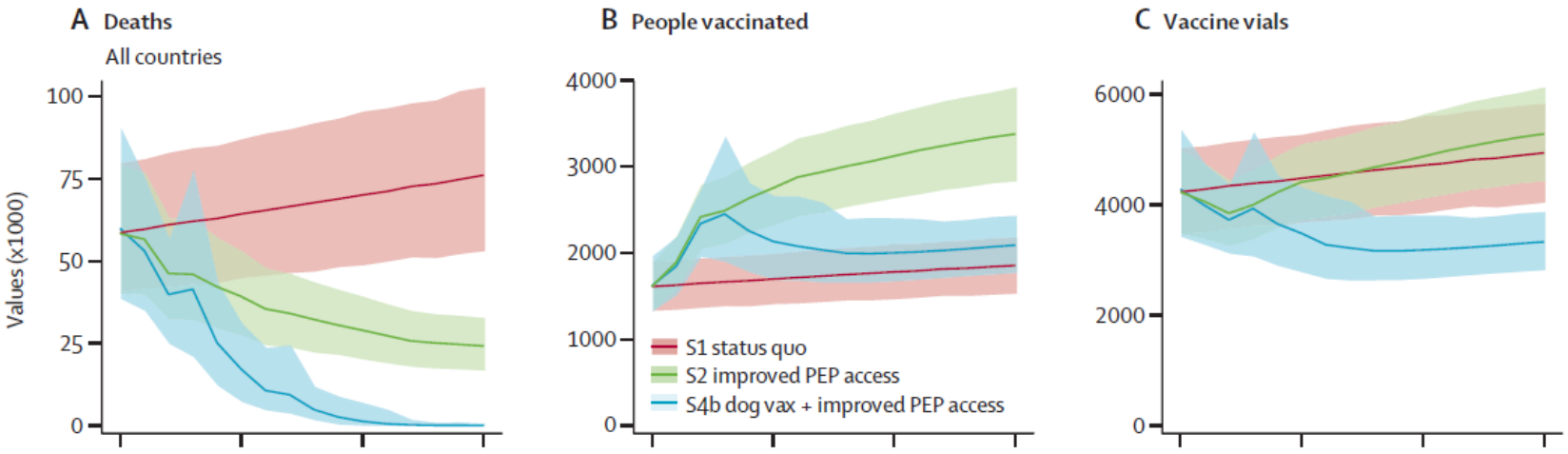
Estimate of vaccine wastage in Côte d'Ivoire

Increased surveillance through a rapid test

KAP study in human and veterinary workers (Chad)

Free hotline established in Chad

Access to free PEP will not prevent all human deaths!



Estimate from our study:

Only max. 40% of bite cases are suspicious of rabies!

Only max. 10% of bites cases are true exposures!

Core project partners:

CSRS
Centre Suisse de Recherches Scientifiques en Côte d'Ivoire

CENTRE DE SUPPORT EN SANTÉ INTERNATIONALE
CSSI

LABORATOIRE CENTRAL VETERINAIRE BAMAKO

LABORATOIRE DE FARCHA
IRED

Collaborating national institutions:

U.S.T.T.B

RÉPUBLIQUE DU MALI
UN PEUPLE - UN BUT - UNE FOI

UNION - DISCIPLINE - TRAVAIL

Funding:

Gavi
The Vaccine Alliance

Afrique One
Aspire

World Health Organization

Other partners:

Institut Pasteur

GLOBAL ALLIANCE
FOR RABIES CONTROL

Thank you for your attention!