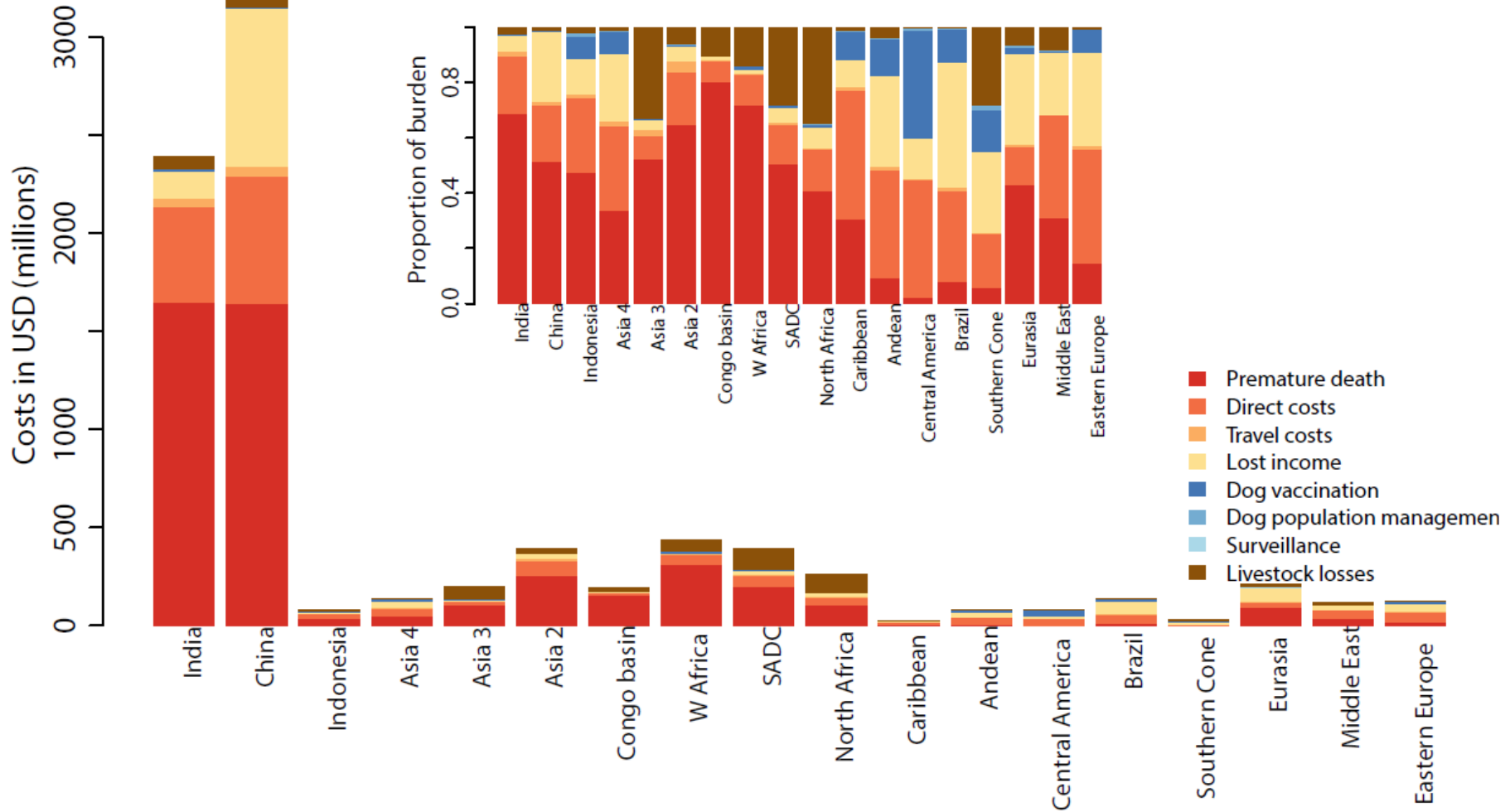


MEEREB Workshop

Health economic parameters in
canine enzootic areas: pre- versus
post- exposure
prophylaxis approaches in humans

April, 2015

Overall, the annual global economic burden of rabies is US \$8.6 billion (95% CIs: 2.9-21.5 billion)



Health Economics of Pre-Exposure Prophylaxis (PrEP) vs. Post-Exposure Prophylaxis (PEP) approach.

Homework

- **Step #1: Situation analysis, what you have already done:**
 - **Estimation of the economic burden of rabies in your country**
 - Data on animal bite exposure
 - Data on PEP regimen implemented
 - Data on costs of PEP overall
 - **Through those data, we can have a first descriptive overview of MEEREB countries burden**
 - To complete the picture, and when data were missing, estimates taken from K Hampson *et al.* in PLoS Neglected Tropical Disease”, 2015

“Estimating the Global Burden of Endemic canine Rabies”

Statplanet presentation

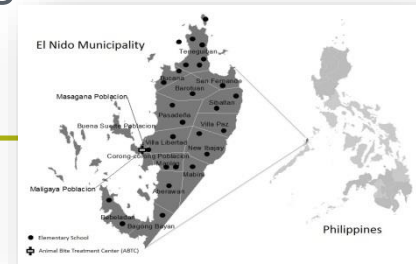
Health Economics of Pre-Exposure Prophylaxis (PrEP) vs. Post-Exposure Prophylaxis (PEP) approach.

Topic of the day

- **Step #2: The potential economic benefit of PrEP:**
 - **Pre-Exposure prophylaxis, WHO recommendation¹**
 - Pre-Exposure Prophylaxis is recommended for anyone who is at continual, frequent or increased risk for exposure to the rabies virus, as a result of their residence or occupation [...].
 - Children living in or visiting rabies-affected areas are at particular risk and should be given pre-exposure prophylaxis on an individual basis or in mass campaigns when there are no economic, programmatic or logistical obstacles.
 - **PrEP provides economic benefits when targeted to high risk population**
 - Since it reduces the PEP doses from 5 to 2 and it eliminates the need for RIG
 - Overall, it reduces cost per life-saved
 - When targeting specific populations
 - Roll out varying according to risk and access

Protecting children from Rabies: a school-based campaign in El Nido

Example of a pilot project in Philippines



● Background:

● **Anti-Rabies act of 2007:**

- Policy of the State to control, prevent the spread and eventually eliminate human and animal rabies
- Reinforces the National Rabies Prevention and Control Program
 - Mandates the provision of PrEP of schoolchildren aged 5 to 14 years in areas where there is a high incidence of rabies

● Observational prospective study, with the following objectives:

- **To detect the true incidence of animal bites in school children aged 5-14yo**
 - Using active surveillance and comparing those data to estimates from the existing passive surveillance system.
- **To assess the impact of rabies PrEP interventions (education and prophylaxis pre-exposure)**
 - On animal bite incidence
 - On the health economic impact of such interventions.

Timeline of study activities

Example of a pilot project in Philippines



Children aged 5-14yo (n=4,700)
From 27 public schools in El
Nido, Philippines

July 2011

Jan- Feb 2012

July 2012

December 2012

Active surveillance, follow-up for any suspect rabies exposures

PrEP

3 ID doses at 0, 7, 28 days

Administered in the school by municipal health officer and / or nurses

Direct medical costs included:

Cost of biologicals

Cost per shipment

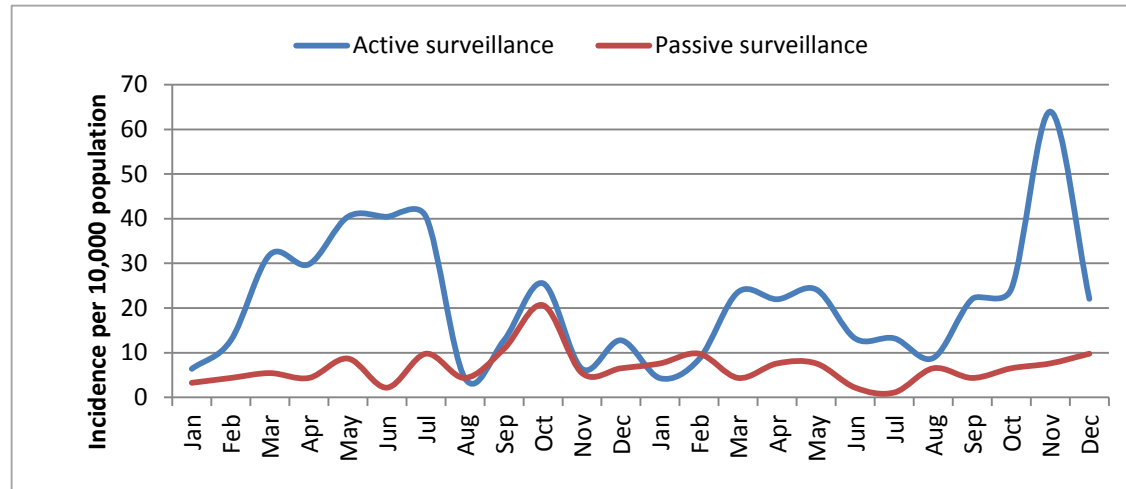
Cost of consumables

Education

Adaptation of the rabies curriculum teacher's manual

Incidence of dog bites among 5-14yo children in El Nido from passive and active surveillance, 2011 to 2012

Example of a pilot project in Philippines



	2011	2012
Passive surveillance	8.6 / 1,000 children	7.5 / 1,000 children
Active surveillance	26.4 / 1,000 children	24.7 / 1,000 children

- Active surveillance is the follow up of the study cohort, incidence computed based on person-time of follow-up
- Passive surveillance is based on numbers of consultations at the Animal Bite Treatment Center and population 5-14yo children in El Nido

The long term economic benefit of PrEP

Example of a pilot project in Philippines

To further explore the benefits of PrEP, projected costs of two hypothetical cohorts of children bitten by a dog were assessed, according to two scenarios:



El Nido cohort
n=3,894

Scenario 1, No PrEP

- Exposed children receive the standard of care for PEP (intradermal method (2-2-2-0-1))
- 15% of those children receive ERIG

Scenario 2, PrEP

- All the children benefit from the complete schedule of PrEP
- When exposed, children receive 2 booster doses on day 0 and 3
- No RIG administration

Costs considered

PEP

- Biological costs (2-2-2-0-1)
- RIG costs (15% of the cases)
- Consumables

PrEP

- Biological costs (1-1-1)
- Consumables
- Shipment costs

Booster PEP

- Biological costs (1-1)
- No RIG
- Consumables

The long term economic benefit of PrEP

Example of a pilot project in Philippines

To further explore the benefits of PrEP, projected costs of two hypothetical cohorts of children bitten by a dog were assessed, according to two scenarios:



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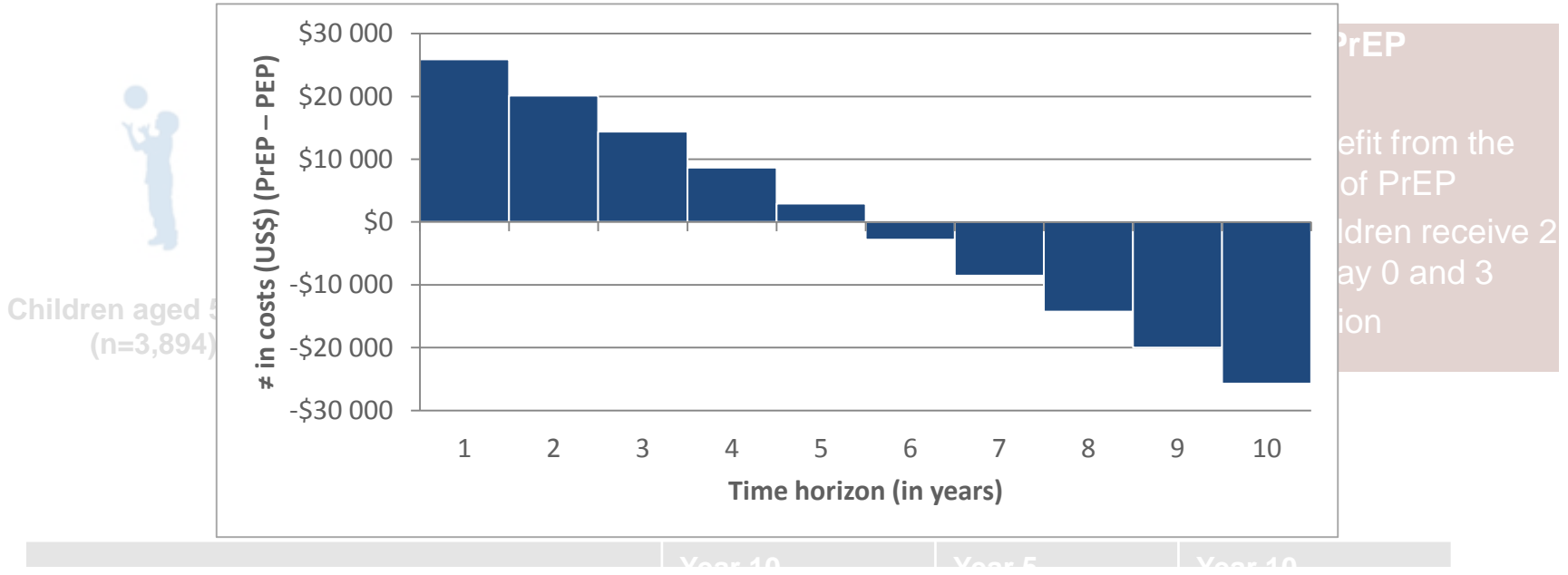
Scenario 2, PrEP

- All the children benefit from the complete schedule of PrEP
- When exposed, children receive 2 booster doses on day 0 and 3
- No RIG administration

	Year 1	Year 5	Year 10
Cumulative exposures	99	495	990
Cumulative costs scenario 1, No PrEP	\$7,600	\$37,800	\$75,700
Cumulative costs scenario 2, PrEP	\$31,600 + \$1,800	\$40,800	\$49,900

The long term economic benefit of PrEP

Example of a pilot project in Philippines



Simple but obvious approach

- Conservative

- as it takes into consideration only costs, and no health benefits
- as it does not take into account the loss of income related to visits to the rabies center

- Potential overestimation

- the incidence bite is constant over the time horizon

Health Economics of Pre-Exposure Prophylaxis (PrEP) vs. Post-Exposure Prophylaxis (PEP) approach.

- Can a similar strategy be applied in your country?

Drivers



Barriers / challenges



Health Economics of Pre-Exposure Prophylaxis (PrEP) vs. Post-Exposure Prophylaxis (PEP) approach.

Can a similar strategy be applied in other countries?

● Eligible children for PrEP

● Questions to tackle:

- Identification of the target population
 - Geographic area:
 - Rural / urban?
 - Access to vaccination centers?
 - Definition of the true incidence of exposures in such population?
 - Availability of state-of-the art post-exposure prophylaxis?
 - ...

● Roll out of PrEP program

● Questions to tackle:

- Mass campaigns or associated with EPI?
 - Barriers to implementation of PrEP in the target population?
 - Major advocacy arguments?
 - ID administration?
 - ...
-

Back Up

April, 2015

This Workshop is dedicated to Health Economics of Pre-Exposure Prophylaxis (PrEP) vs. Post-Exposure Prophylaxis (PEP) approach.

● Step #2: The potential economic benefit of PrEP:

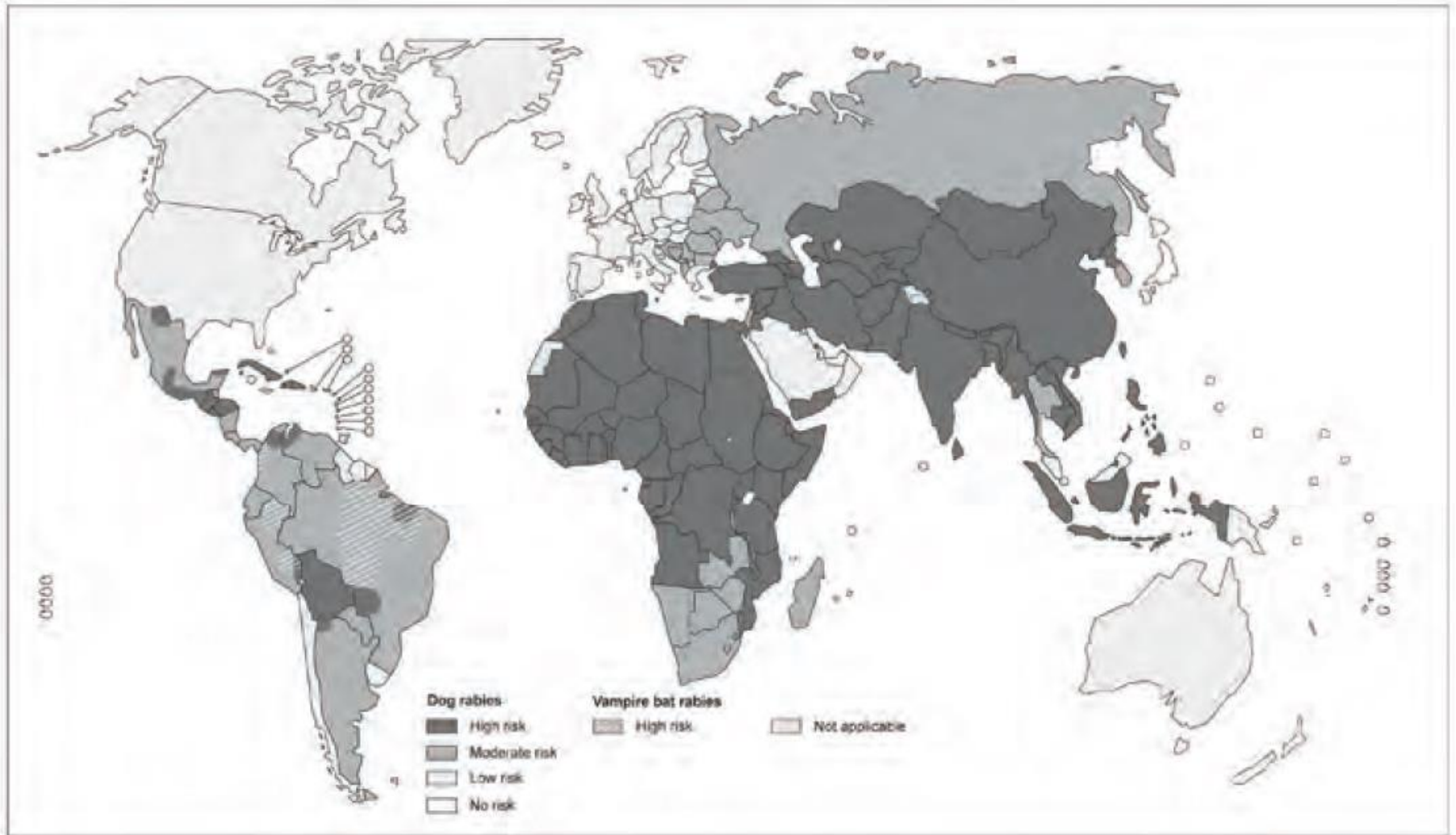
● Pre-Exposure prophylaxis

- Pre-Exposure Prophylaxis is recommended for anyone who is at continual, frequent or increased risk for exposure to the rabies virus, as a result of their residence or occupation [...].
- Children living in or visiting rabies-affected areas are at particular risk and should be given pre-exposure prophylaxis on an individual basis or in mass campaigns when there are no economic, programmatic or logistical obstacles.

● Advice to travelers and residents according to level of risk

- **No risk:** No need for pre-exposure prophylaxis.
- **Low and moderate risk:** People involved in any activities that might bring them into direct contact with non haematophagous bats and other wild animals, especially carnivores should receive pre-exposure prophylaxis
- **High risk:** People travelling to rural areas or involved in activities such as running, bicycling, camping or hiking should receive pre-exposure prophylaxis. Prophylaxis is also recommended for people with significant occupational risks, such as veterinarians, and residents of areas with a significant risk for exposure to domestic animals, particularly dogs and cats as well as wildlife including vampire bats. Children should be preventively immunized as they are at higher risk.

Four categories of countries or areas, from those at no risk to those at low, moderate and high risk



Health Economics of Pre-Exposure Prophylaxis (PrEP) vs. Post-Exposure Prophylaxis (PEP) approach.

Topic of the day

- **Background statement:**

- **The most cost-effective strategy for preventing rabies in people is by eliminating rabies in dogs through vaccination¹**
 - Vaccinating 70% of dog population prevents 99% of human cases²
- **Pre-Exposure prophylaxis, WHO recommendation¹**
 - Pre-Exposure Prophylaxis is recommended for anyone who is at continual, frequent or increased risk for exposure to the rabies virus, as a result of their residence or occupation [...].
 - Children living in or visiting rabies-affected areas are at particular risk and should be given pre-exposure prophylaxis on an individual basis or in mass campaigns when there are no economic, programmatic or logistical obstacles.
- **PrEP provides economic benefits when targeted to high risk population since it reduces the PEP doses from 5 to 2 and it eliminates the need for**

RIG
