

# One health - The role of animal welfare in disease prevention and control

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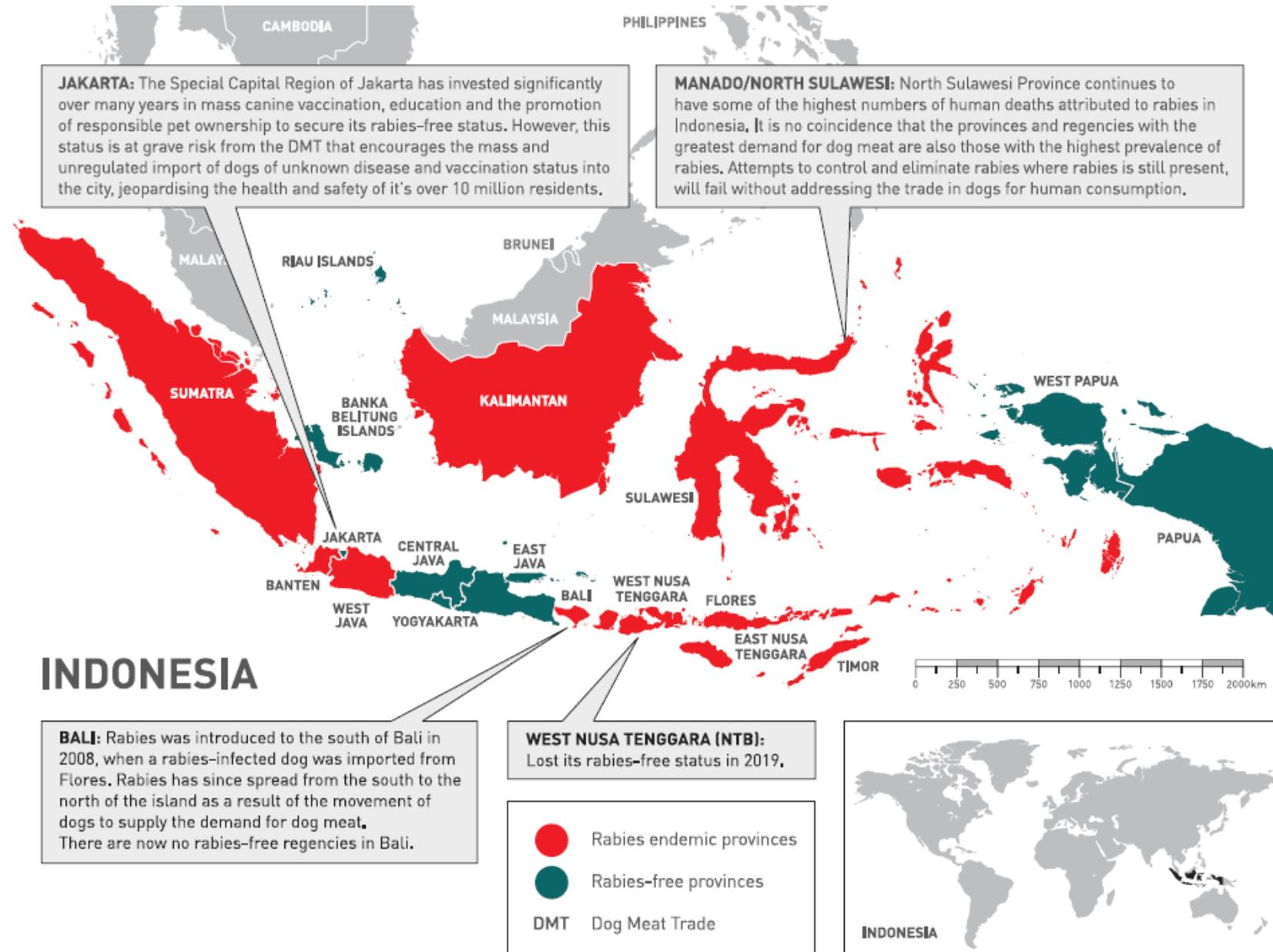
Bali Animal Welfare Association (BAWA)

DVM FOUR PAWS



# Rabies free provinces Indonesia (map)

Rabies is endemic in  
**26 out of 34** provinces



## KASUS RABIES BALI -7 NOVEMBER

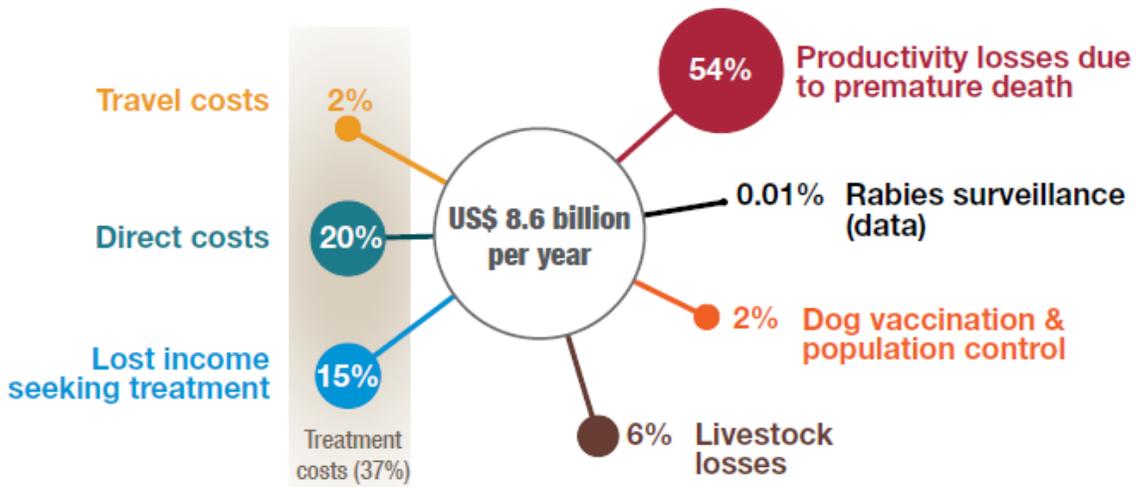
Kab	Jan	Peb	Mar	Apr	Mei	Jun	Jul	Ags	Sept	Okt	Nop	Tot
Badung	1	1	0	3	2	2	1	1	0	1	0	12
Bangli	3	4	6	14	11	6	7	8	6	4	1	70
Buleleng	12	4	6	13	19	35	13	25	4	7	1	139
Denpasar	0	1	0	0	1	0	0	0	2	0	0	4
Gianyar	1	1	2	4	0	1	0	1	0	4	1	15
Jembrana	15	11	13	44	30	25	23	11	11	6	0	189
Karangasem	6	6	10	21	14	17	9	11	7	9	0	110
Klungkung	0	1	4	2	6	2	5	5	5	1	1	32
Tabanan	1	3	0	0	3	2	3	5	3	5	1	26
<b>Grand Total</b>	<b>39</b>	<b>32</b>	<b>41</b>	<b>101</b>	<b>86</b>	<b>90</b>	<b>61</b>	<b>67</b>	<b>38</b>	<b>37</b>	<b>5</b>	<b>597</b>

## Jumlah Desa Tertular – 7 Nopember 2022

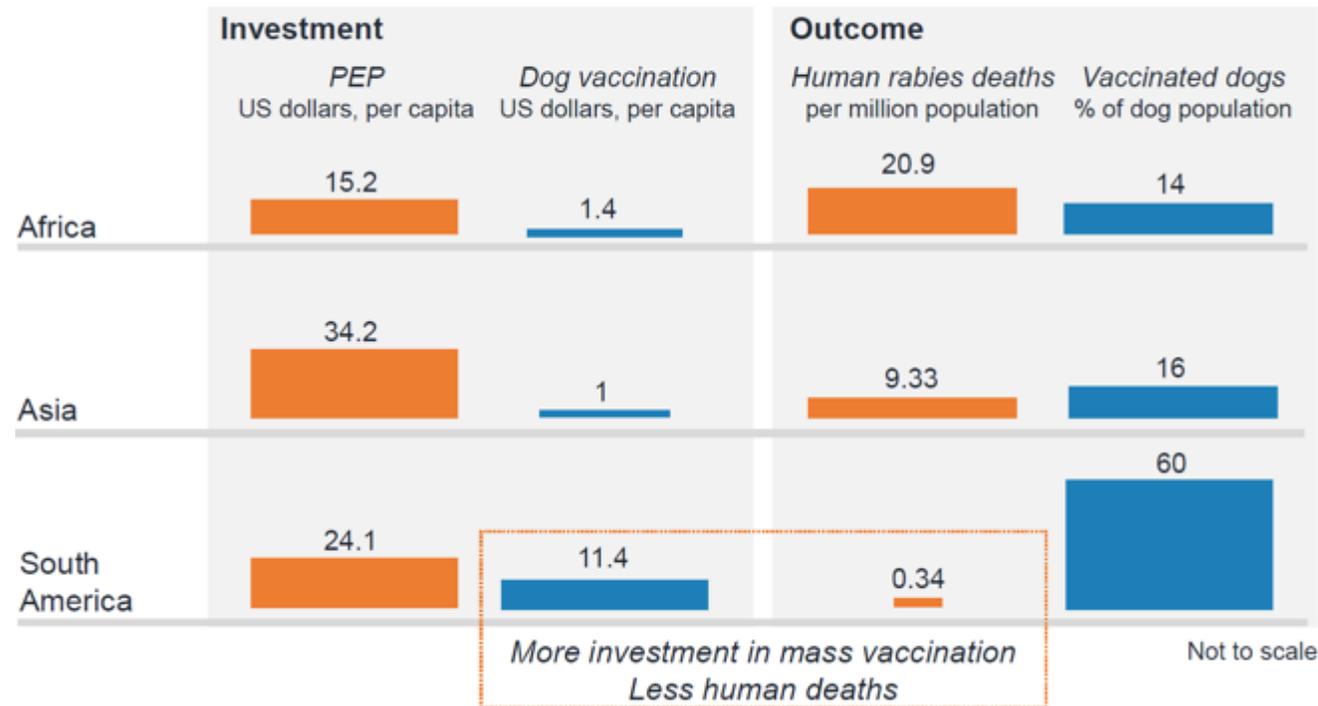
KABUPATEN	Jumlah Kasus	Jumlah Desa	Jumlah Desa Tertular	Jumlah Desa Berulang
Badung	12	62	8	4
Bangli	70	72	33	15
Buleleng	139	148	78	36
Denpasar	4	43	4	0
Gianyar	15	70	14	1
Jembrana	189	51	47	39
Karangasem	110	78	46	23
Klungkung	32	59	20	23
Tabanan	26	133	20	5
<b>TOTAL</b>	<b>597</b>	<b>716</b>	<b>270</b>	<b>132</b>

# Economical rabies burden

- Global cost burden in treatment significantly outweighs investments on prevention efforts
- The more dogs vaccinated, the less human deaths



## Current spending on rabies underinvests in dog vaccination



# Economic loss in Bali due to rabies

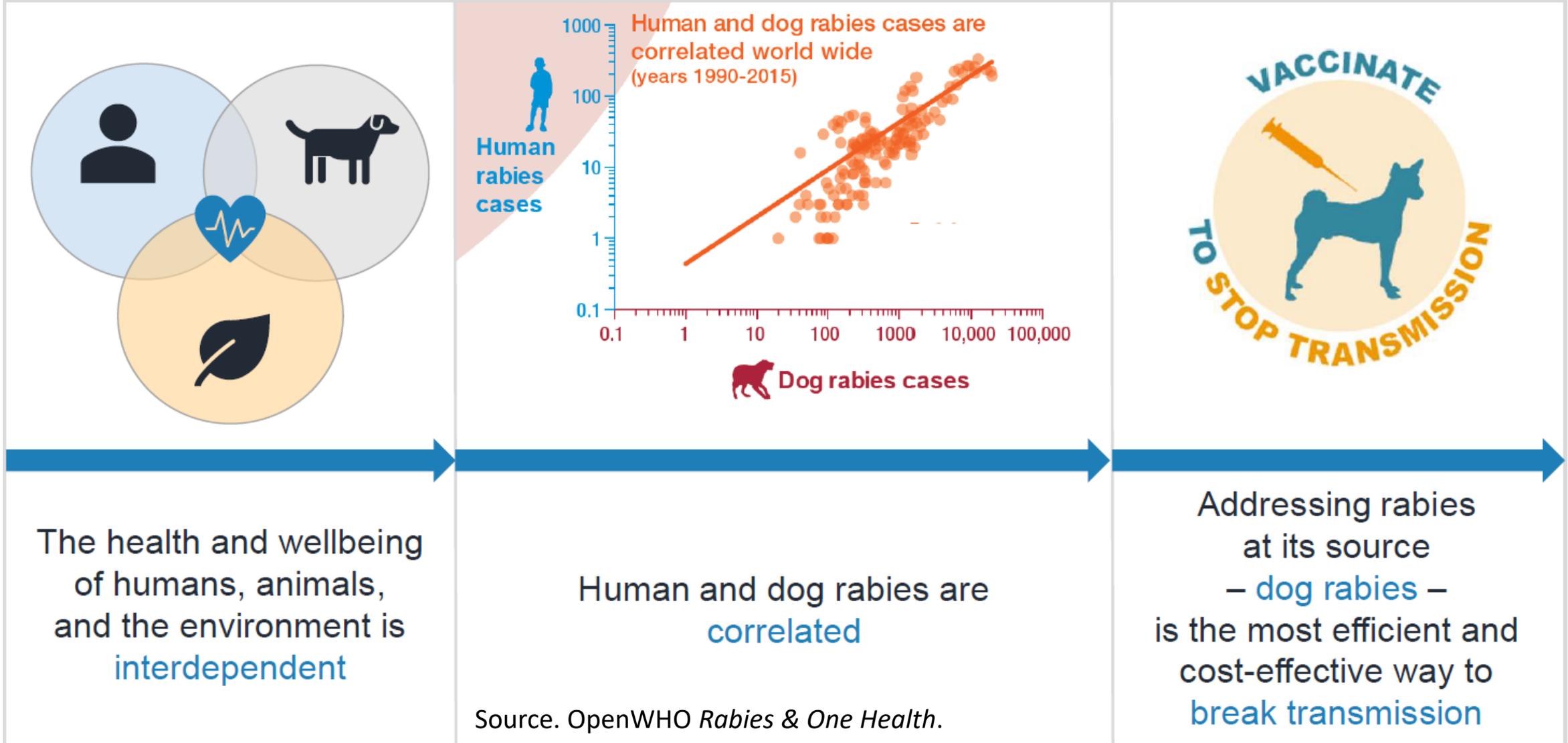
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- 336,5 miliar spent in 2008-2011 (Batan I.W. et al. 2015)
  - Treatment of human post exposure
  - Vaccination of dogs
  - Dog elimination
- Calculation does not account for Cost of illness
  - Individual out of pocket
  - Burden on Healthcare system
  - Productivity losses

<https://www.slideshare.net/Naipospos/one-health-roadmap-eliminasi-rabies-nasional-2030-jakarta-27-agustus-2019>



# Rabies – a chance for One Health



Effective  
and  
sustainable  
rabies  
elimination  
strategy

## One Health

The link between  
animal health and welfare and  
human health  
=  
rabies control.





**PROGRAM DHARMA –**  
**PROGRAM PEMBERDAYAAN MASYARAKAT**  
**DESA UNTUK MEWUJUDKAN BALI SEHAT**  
**BEBAS RABIES**

**PERANAN PEMANGKU KEPENTINGAN DALAM PENGENDALIAN  
RABIES DENGAN PENDEKATAN *ONE HEALTH* TERINTEGRASI DI  
BALI**

*ROLE OF STAKEHOLDER IN RABIES CONTROL WITH INTEGRATED ONE HEALTH  
APPROACH IN BALI*

**Made Subrata<sup>1</sup>, Sang Gede Purnama<sup>1</sup>, Arya Utami<sup>1</sup>, Kadek Karang Agustina<sup>2</sup>, IBN. Swacita<sup>2</sup>**

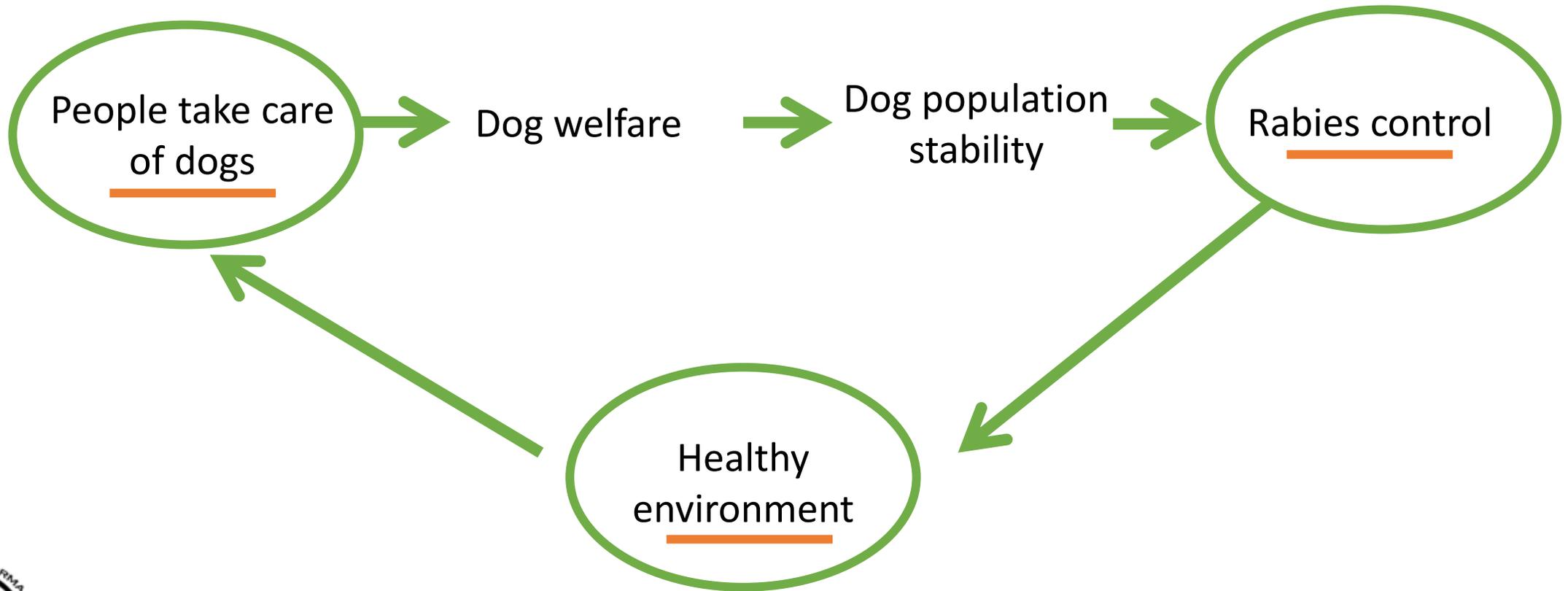
<sup>1</sup>PS. Kesehatan Masyarakat, Fakultas Kedokteran, Universitas Udayana

<sup>2</sup>Fakultas Kedokteran Hewan, Universitas Udayana

Tabel 2. *Gap Analysis* pengendalian Rabies di Bali

Variabel	Keterangan
<b>Manajemen HPR</b>	
Sistem surveilan	Belum ada sistem pendataan yang akurat terhadap data jumlah anjing
Vaksinasi anjing	Sistem vaksinasi masih tersentral sesuai jadwal sehingga jika ada anjing yang belum tervaksin harus menunggu jadwal vaksin berikutnya.
Cara pemeliharaan anjing	Masyarakat masih banyak yang tidak memberikan makan dan minum anjingnya secara rutin serta membiarkan lepas mencari makan berkeliaran. Kesadaran masyarakat dalam memelihara anjing masih rendah.
Program Kontrol Populasi	Anjing yang dilepas liarkan semakin banyak dan tidak jelas status vaksinnya. Populasinya tidak terkendali, sehingga perlu dilaksanakan program kontrol populasi dengan sterilisasi anjing.
<b>Manajemen Manusia</b>	
Penanganan kasus gigitan	Masih kurangnya edukasi pada masyarakat dalam penanganan kasus gigitan anjing. Semua kasus kematian karena tidak mendapatkan vaksin anti rabies. Ini menunjukkan bahwa belum ada sistem pelaporan dan respons pada kasus gigitan.
Kurangnya edukasi pada masyarakat dan pelibatan partisipasi dalam program vaksin	Masyarakat belum mendapatkan edukasi yang baik. Pemahaman masyarakat masih rendah tentang penanganan luka bekas gigitan dan cara memelihara anjing. Terutama di daerah pedesaan.
Kerjasama pemangku kepentingan yang lemah	Kerjasama dalam melakukan penanganan gigitan HPR perlu dilakukan koordinasi yang intensif antara puskesmas dan puskesmas.

**One Health.** The link between animal health, welfare and human health = rabies control.





# PROGRAM DHARMA

## Rabies Prevention & Eradication program base on Villages

### Data Collection & Education

Started with mapping & community engagement in villages (door to door visit), involving village representative every banjar trained by expertise from Udayana



# 1

### PARTNERSHIP

Udayana Working together with Dinas Kesehatan, Dinas Pertanian, BAWA and international funders to provide materials, tools, and others resources to implement PD in villages

### Health Day

Providing health education, rabies vacc, and animal treatments for villager



# 2

### DATA

PD release scientific and accurate data to support the better rabies program and effective planning and annual updated. (Dog demography & attitude survey)

### Sustainability

In charge to change the community behavior, communities supported with PD make local regulation about caring pet and for the program sustainability by village itself



# 3

### REGULATION

Perarem Desa Adat Segala, Perdes Purwa Kerthi, Perdes Sanur Kaja, Perdes Jagapati, Perdes Sanur Kauh.

# 4

### PROGRAM SUCCES

No human rabies cases in PD villages, all cases handled well, animal welfare awareness of community is increase, **wining innovation program in national scale**, program sustain by village fund.



# Evaluation of Community-Based Dog Welfare and Rabies Project in Sanur, a Sub-district of the Indonesian Island Province of Bali

 Ni Wayan Arya Utami<sup>1</sup>,  Kadek Karang Agustina<sup>2</sup>,  Kathryn Nattrass Atema<sup>3</sup>,  Gusti Ngurah Bagus<sup>4</sup>,  Janice Girardi<sup>4</sup>,  Mike Harfoot<sup>5</sup>,  Yacinta Haryono<sup>4</sup>,  Lex Hiby<sup>6</sup>,  Hendra Irawan<sup>4</sup>,  Pande Putu Januraga<sup>1</sup>,  Levin Kalalo<sup>4</sup>,  Sang Gede Purnama<sup>1</sup>,  I. Made Subrata<sup>1</sup>,  Ida Bagus Ngurah Swacita<sup>2</sup>,  I. Made Indrayadnya Swarayana<sup>4</sup>,  Dewa Nyoman Wirawan<sup>1</sup> and  Elly Hiby<sup>3\*</sup>

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<sup>2</sup> Department of Veterinary Public Health, Faculty of Veterinary Medicine, Udayana University, Denpasar, Indonesia

<sup>3</sup> International Fund for Animal Welfare, Yarmouth Port, MA, United States

<sup>4</sup> Bali Animal Welfare Association (BAWA), Ubud, Indonesia

<sup>5</sup> Independent Researcher, Cambridge, United Kingdom

<sup>6</sup> Conservation Research Ltd., Cambridge, United Kingdom

<https://www.frontiersin.org/articles/10.3389/fvets.2019.00193/full#B10>

# Figure 1

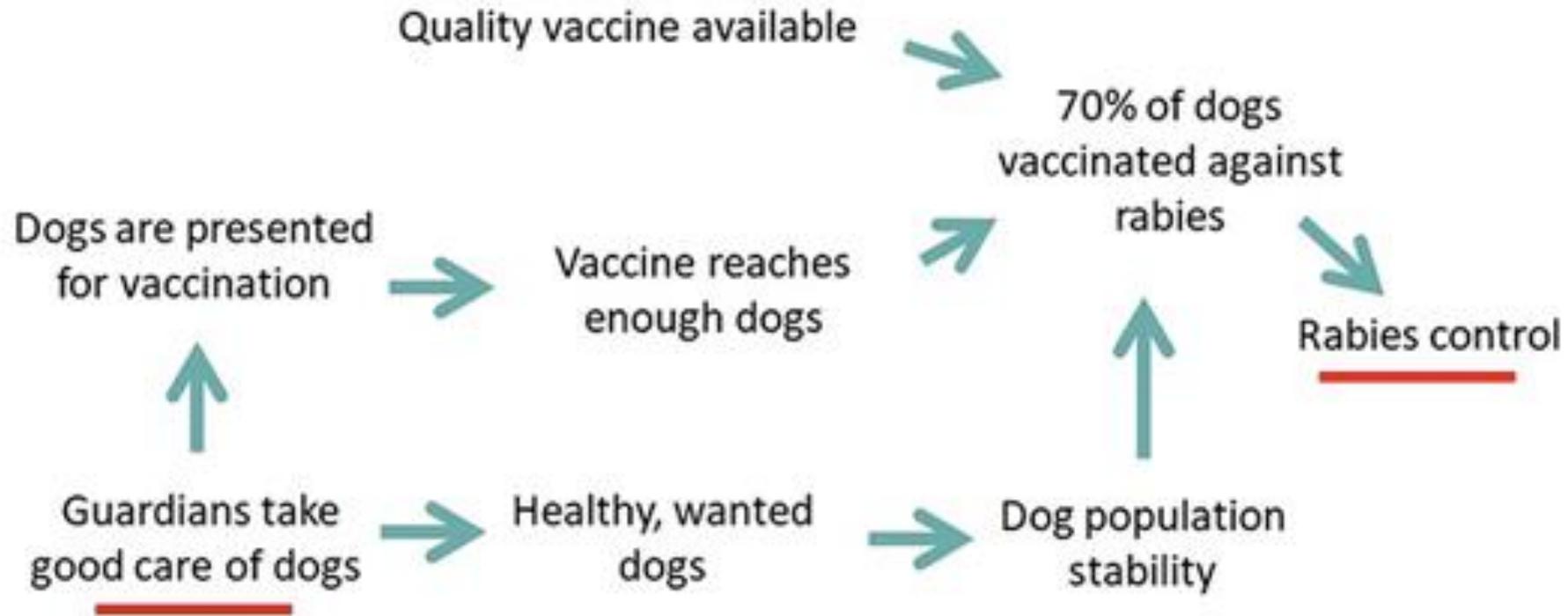


FIGURE 1. Illustration of the theory of change for Program Dharma contribution to rabies control via improvement in dog care practices.

# Table 1

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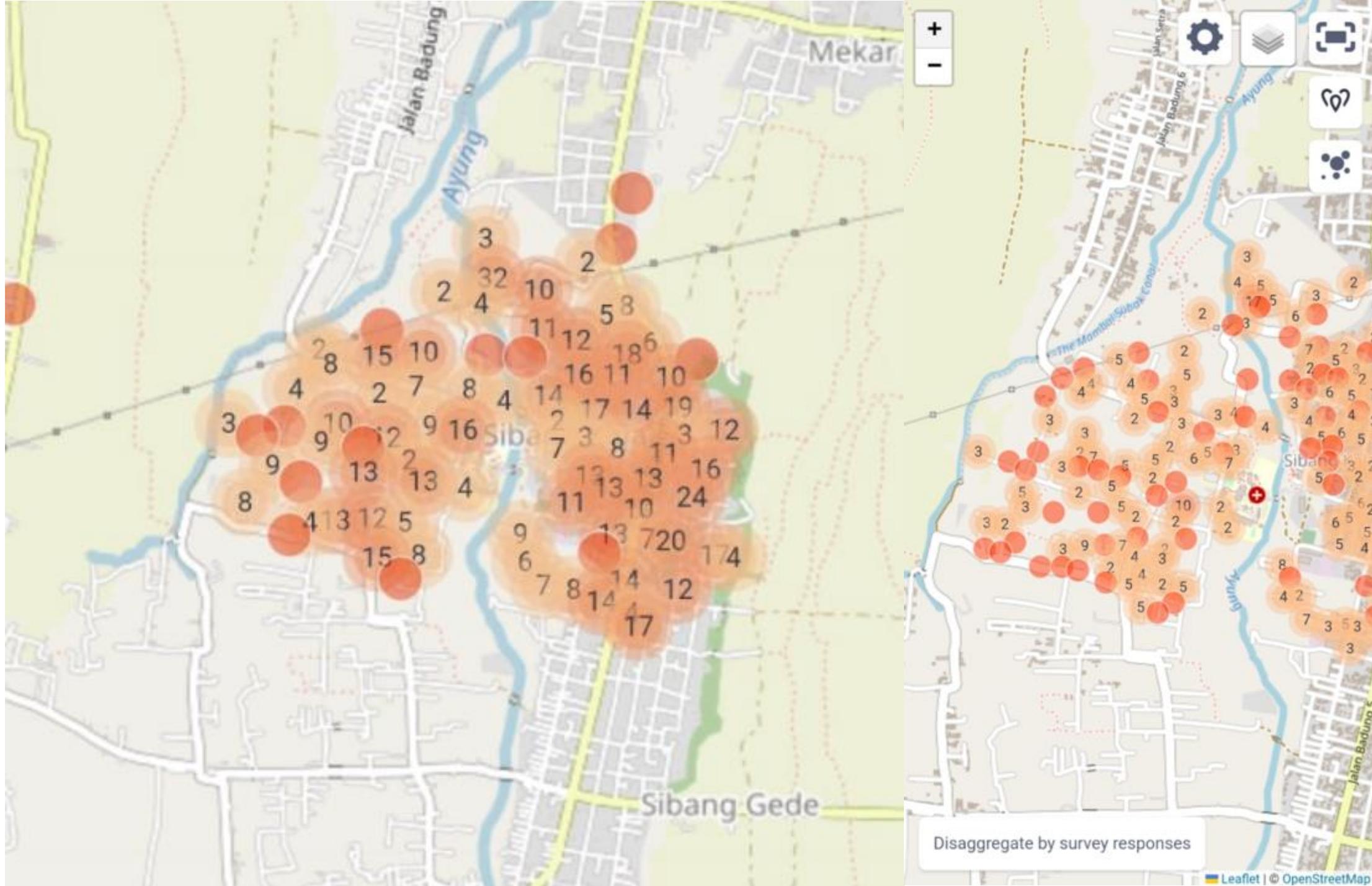
**Program Dharma mentor (T1)  $N = 7$** 

- Train T2s in basic animal welfare and door-to-door owner socialization
- Managing, motivating and evaluating T2s
- Support T2s in baseline data collection
- Help T2s plan regular community events and fundraising activities
- Facilitate coordination with local veterinary service providers
- Oversee *desa*-level activities
- Project reporting and communication

**Program Dharma community-based agent (T2)  $N = 22$  (Sanur Kaja  $N = 4$ , Kelurahan Sanur  $N = 7$ , Sanur Kauh  $N = 11$ )**

- Through door-to-door socialization with owners and regular street surveys, document each dog in *banjar* and monitor welfare and rabies vaccination status
  - Organize regular access to veterinary services for *banjar* dogs
  - Regular meeting with T1s and other T2s to assist in the organization of community events, small group meetings and public education.
  - First point of contact for any dog problems in *banjar*
- 

TABLE 1. Responsibilities of the two key roles in Program Dharma; the mentor (T1) and the community-based agent (T2).



Disaggregate by survey responses

Figure 7

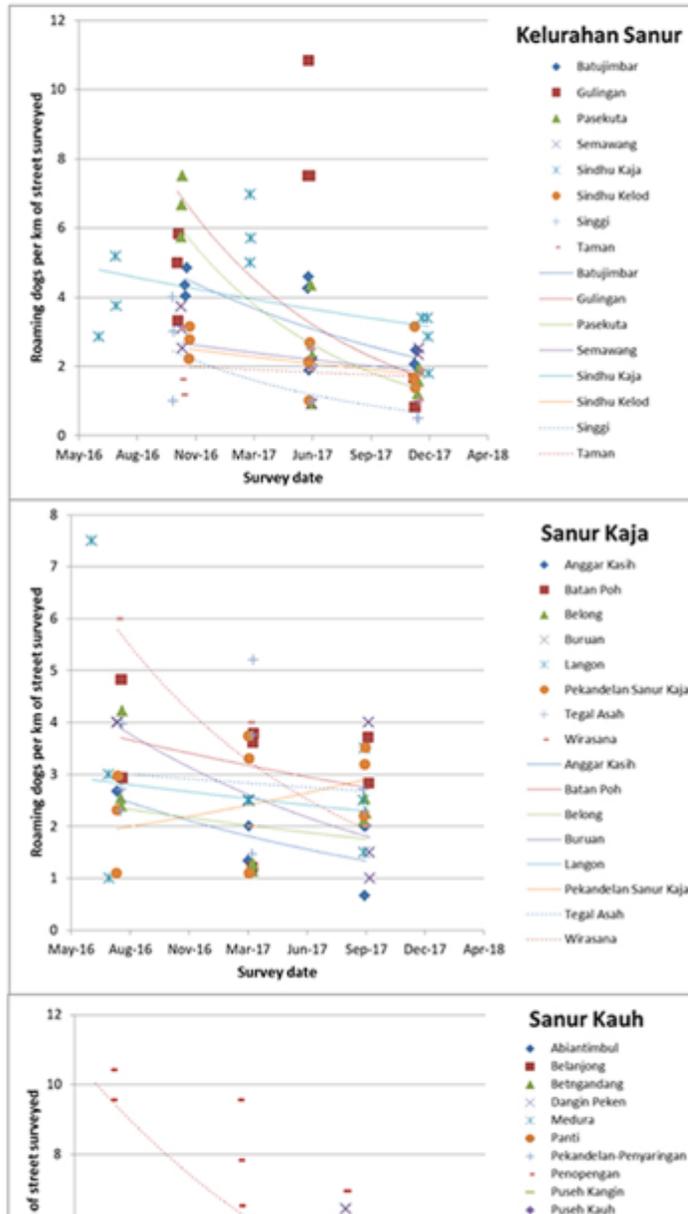
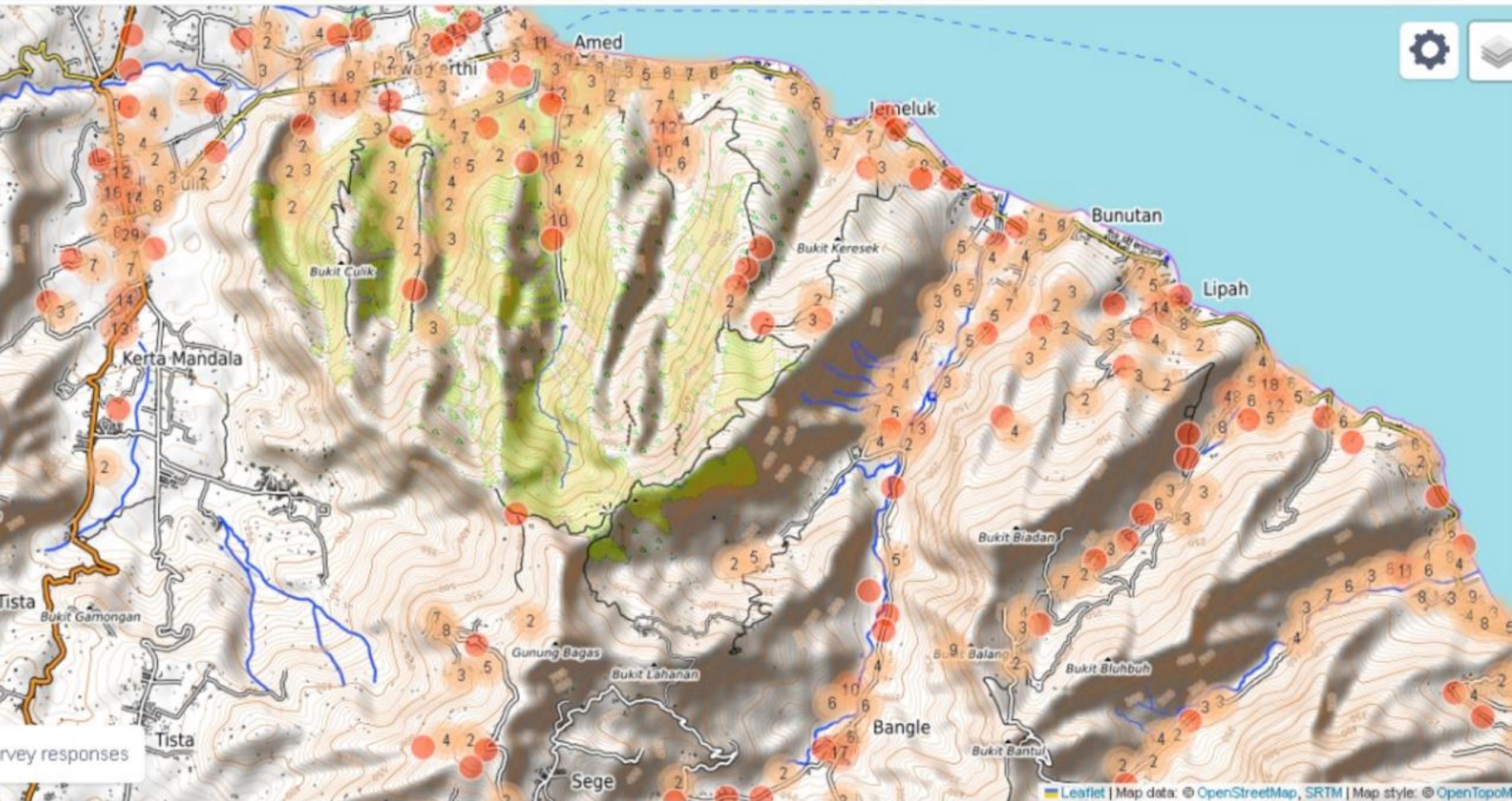


FIGURE 7. (A–C) Change over time in the number of roaming dogs observed per km of street surveyed for each *banjar* within the three *desas* (Kelurahan Sanur, Sanur Kaja, Sanur Kauh). Colored icons represent roaming dog density on each of three replicate surveys along the same *banjar* survey route, across three street survey events every 6–8 months, with best fit exponential trendlines indicating the trend over time for each *banjar*.

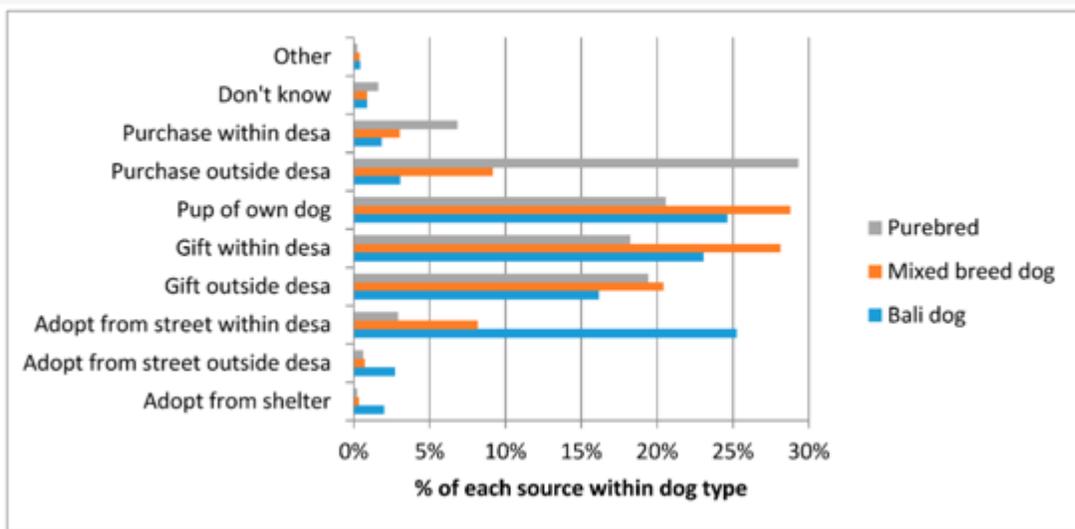
### Roaming Dog Density

There has been a statistically significant decline in the density of roaming dogs in all three *desas* over time. In Kelurahan Sanur there was an average 47.2% reduction per year, equivalent to a reduction of 2.75 dogs per km of street surveyed in the first year ( $F = 7.448$ ,  $d.f. = 8$ ,  $p < 0.001$ ); in Sanur Kaja there was an average 23.6% reduction per year, equivalent to a reduction of 0.51 dogs per km of street surveyed in the first year ( $F = 1.896$ ,  $d.f. = 8$ ,  $p = 0.0339$ ); and in Sanur Kauh an average 27.7% reduction per year, equivalent to a reduction of 1.04 dogs per km of street surveyed in the first year ( $F = 5.228$ ,  $d.f. = 12$ ,  $p = 0.00207$ ). The density observed in each *banjar* and individual best fit trendlines assuming an exponential decay over time is shown in [Figures 7A–C](#). This illustrates that the rates of decay are similar in most banjars.



Survey responses

Figure 1. Source of dogs, broken down by dog breed type.



## Dog Ecology and Rabies Knowledge of Owners and Non-Owners in Sanur, A Sub-District of the Indonesian Island Province of Bali

by [Elly Hiby](#)<sup>1,\*</sup>, [Kadek Karang Agustina](#)<sup>2</sup>, [Kate Natras Atema](#)<sup>1</sup>, [Gusti Ngurah Bagus](#)<sup>3</sup>, [Janice Girardi](#)<sup>3</sup>, [Mike Harfoot](#)<sup>4</sup>, [Yacinta Haryono](#)<sup>3</sup>, [Lex Hiby](#)<sup>5</sup>, [Hendra Irawan](#)<sup>3</sup>, [Levin Kalalo](#)<sup>3</sup>, [Sang Gede Purnama](#)<sup>6</sup>, [I. Made Subrata](#)<sup>6</sup>, [Ida Bagus Ngurah Swacita](#)<sup>2</sup>, [Ni Wayan Arya Utami](#)<sup>6</sup>, [Pande Putu Januraga](#)<sup>6</sup> and [Dewa Nyoman Wirawan](#)<sup>6</sup>

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<sup>2</sup> Department of Veterinary Public Health, Faculty of Veterinary Medicine, Udayana University, Jln. PB Sudirman, Denpasar, Bali 80232, Indonesia

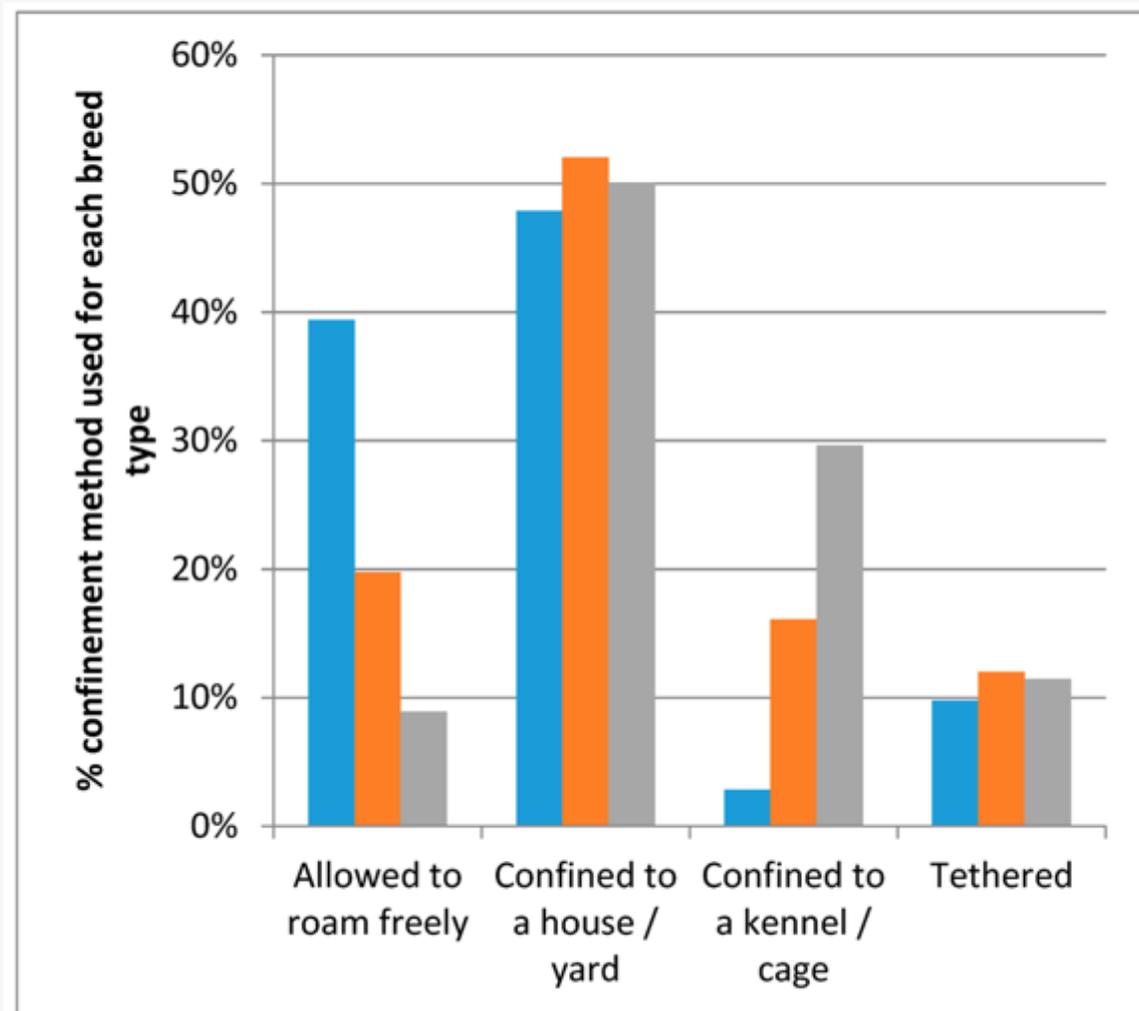
<sup>3</sup> BAWA, Jl. Anak Agung Gede Rai no. 550, Br. Kertha Wangsa, Lodtunduh, Ubud, Gianyar, Bali 80232, Indonesia

<sup>4</sup> UNEP-WCMC, 219 Huntingdon Rd, Cambridge, CB3 0DL, UK

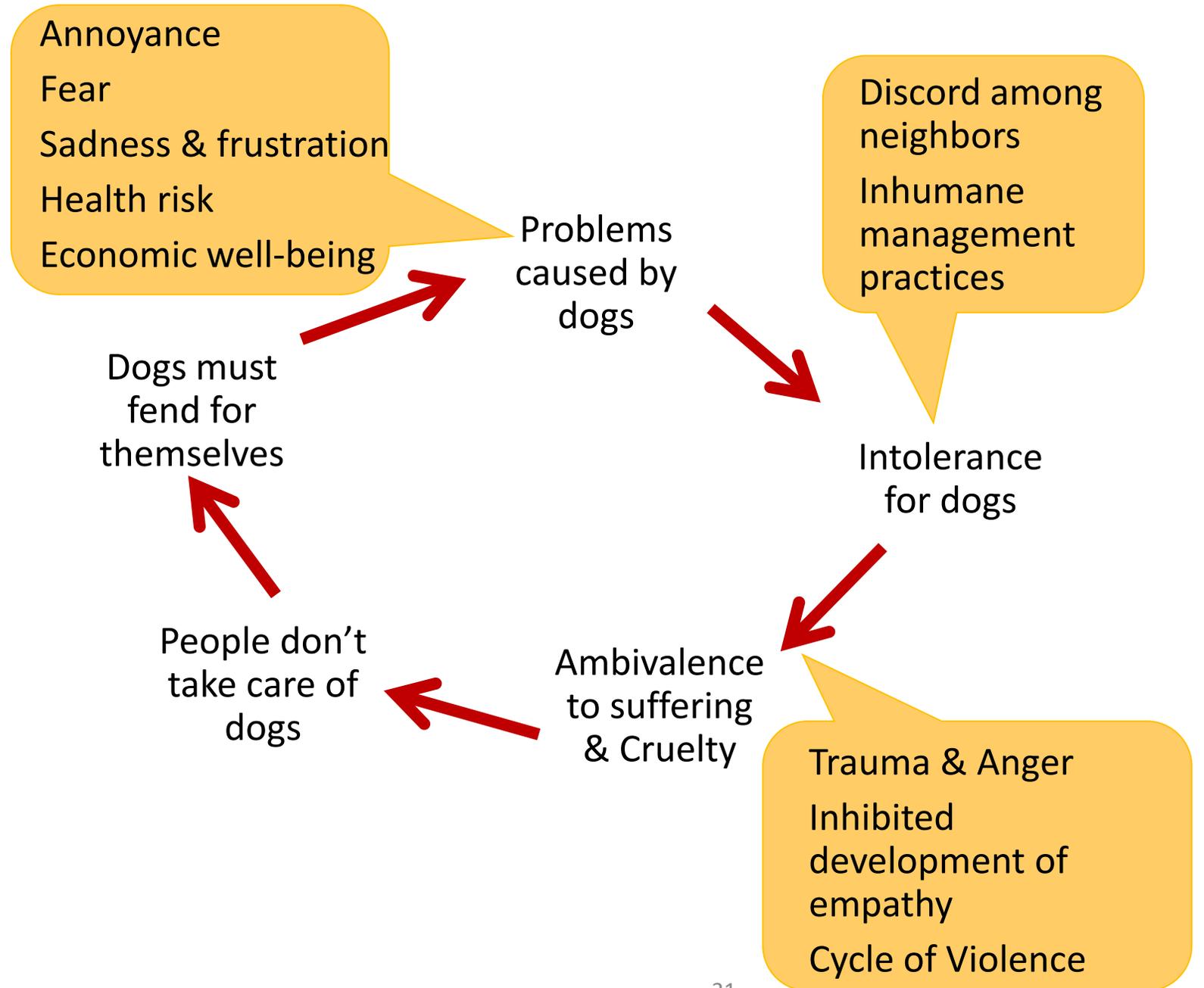
<sup>5</sup> Conservation Research Ltd., Cambridge, CB22 5AL, UK, lexhiby@gmail.com

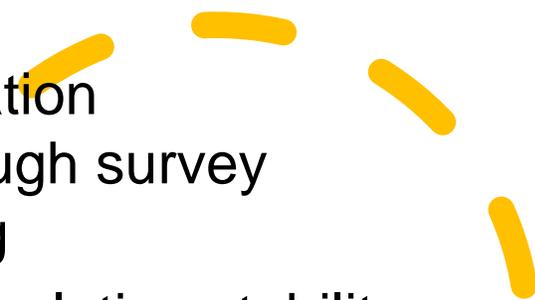
<sup>6</sup> Public Health Department, Faculty of Medicine, Udayana University, Jln. PB Sudirman, Denpasar, Bali 80232, Indonesia

Figure 3. Confinement methods, separated by breed type.



# Cycle of Intolerance





# How Animal Welfare intervention program can contribute to human health

- Identification of dog population
  - Baseline mapping through survey
  - Monitoring and tracking
- Supporting healthy dog population stability
  - Vaccination
  - Spay neutering
  - General treatment, e.g. parasites
- Integrated bite case management (human and dog bite cases)
- Education and awareness to achieve responsible pet ownership
- Support and advocate political stakeholders for sustainability
  - Traditional village regulation Peraram
  - Administrative village regulation Perdes

# What puts the success at risk?

Mass dog elimination (killing, poison, cruelty)

Dog meat trade

Loosing rabies herd immunity through

Unstable dog population or irregular vaccination, vaccine quality, cool chain

Not having enough human vaccination (VAR, BAR)

Not continue public education and awareness

Regulations against animal cruelty not being enforced

Tourist don't want to travel to a rabies endemic country or where animals get culled for elimination

Disrupted collaboration and communication between stakeholders (regular workshops and meetings are needed!), access to data

Bagian 1  
Larangan

Pasal 11

- (1) Setiap Krama Desa Adat dilarang menelantarkan, membuang anjing dan kucing dalam keadaan hidup atau mati di dalam dan di luar Desa Adat Sega.
- (2) Setiap Krama Desa Adat dilarang menganiaya dan/atau membunuh dan mencuri anjing dan kucing yang berada di wilayah Desa sesuai dengan pararem Desa Adat Sega.
- (3) Setiap Krama Desa Adat dilarang memproduksi dan/atau mengedarkan, menyimpan sebagai persediaan, membeli dan menjual anjing dan kucing dalam keadaan hidup atau mati sebagai persediaan makanan untuk tujuan konsumsi.
- (4) Setiap Krama Desa Adat dilarang menyediakan makanan berbahan daging anjing dan kucing untuk konsumsi sendiri maupun orang

Pasal 2

Ruang Lingkup dari Pararem ini adalah:  
Peraturan Desa Adat ini berlaku untuk setiap Krama di wilayah Desa Adat Sega.

Pasal 3

Maksud dari Pararem ini adalah:

1. Untuk menciptakan hubungan yang harmonis antara manusia, anjing dan kucing khususnya serta hewan pada umumnya, guna meningkatkan kualitas pariwisata.
2. Untuk mendukung upaya penanggulangan rabies secara manusiawi.
3. Untuk meningkatkan ketertiban, kebersihan dan kenyamanan di



PARAREM PANGELE

DESA ADAT SEGA

NOMOR 07 TAHUN 2021  
TENTANG

TATACARA PEMELIHARAAN DAN PENANGANAN  
ANJING DAN KUCING  
DI DESA ADAT SEGA

DENGAN RAHMAT TUHAN YANG MAHA ESA  
BANDESA ADAT SEGA

BAB VI  
LARANGAN, SANKSI DAN PENYELESAIAN PELANGGARAN

Bagian 1  
Larangan

Pasal 11

1. Setiap orang dilarang membuang anjing dan kucing dalam keadaan hidup atau mati di dalam dan di luar Desa Purwa Kerthi.
2. Setiap orang dilarang menganiaya dan/atau membunuh dan mencuri anjing dan kucing yang berada di wilayah Desa sesuai dengan peraturan perbekel.
3. Setiap orang dilarang memproduksi dan/atau mengedarkan, menyimpan sebagai persediaan, membeli dan menjual anjing dan kucing dalam keadaan hidup atau mati sebagai persediaan makanan untuk tujuan konsumsi.
4. Setiap orang dilarang menyediakan makanan berbahan daging anjing dan kucing untuk dikonsumsi sendiri maupun oleh orang lain.



PERBEKEL DESA PURWA KERTHI  
KECAMATAN ABANG KABUPATEN  
KARANGASEM

PERATURAN DESA PURWA KERTHI

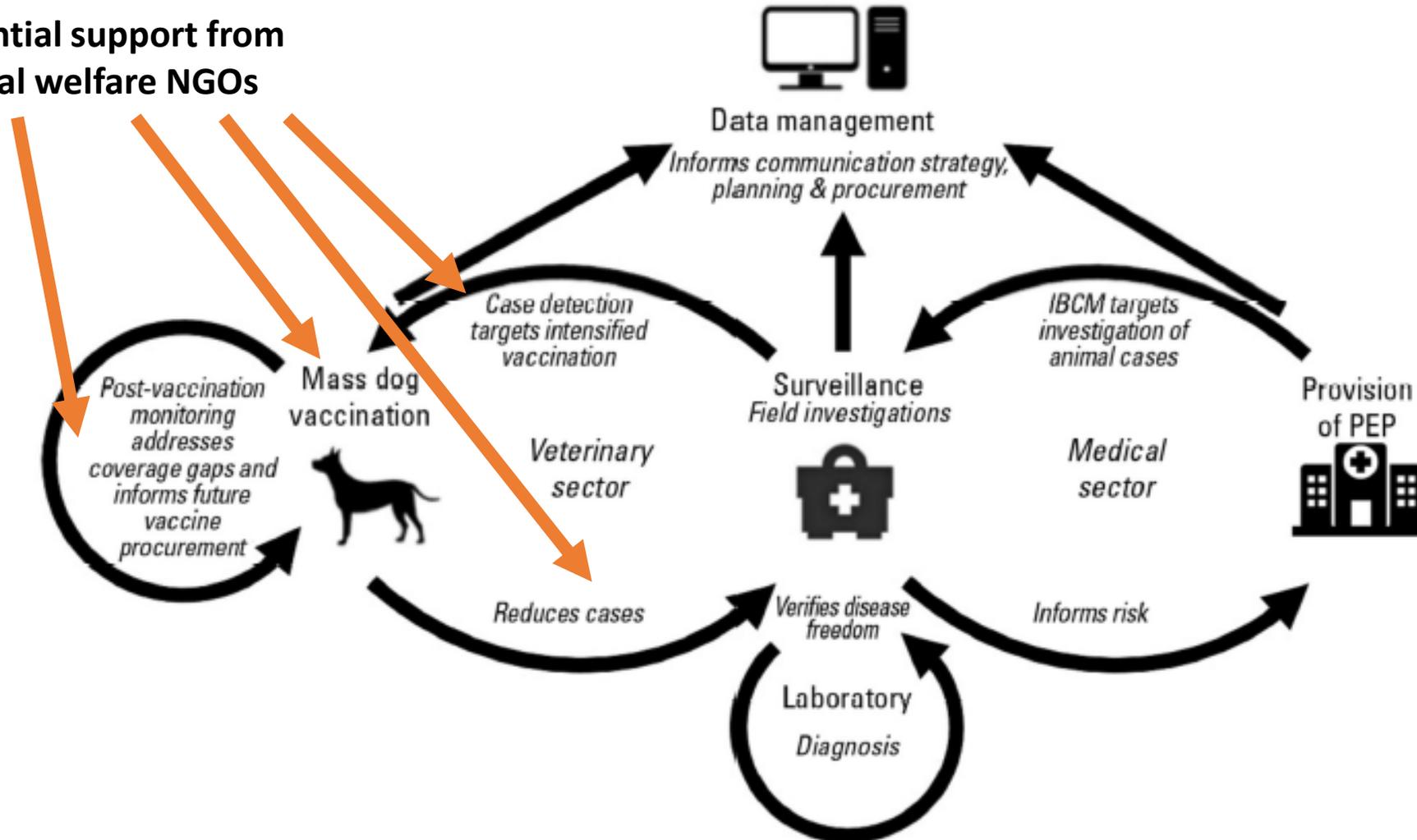
NOMOR 05 TAHUN 2021  
TENTANG

TATACARA PEMELIHARAAN DAN PENANGANAN  
ANJING DAN KUCING  
DI DESA PURWA KERTHI

DENGAN RAHMAT TUHAN YANG MAHA ESA  
PERBEKEL PURWA KERTHI

# Rabies – a chance for One Health

Potential support from animal welfare NGOs



# Bringing together all relevant stakeholders is the road to rabies eradication



