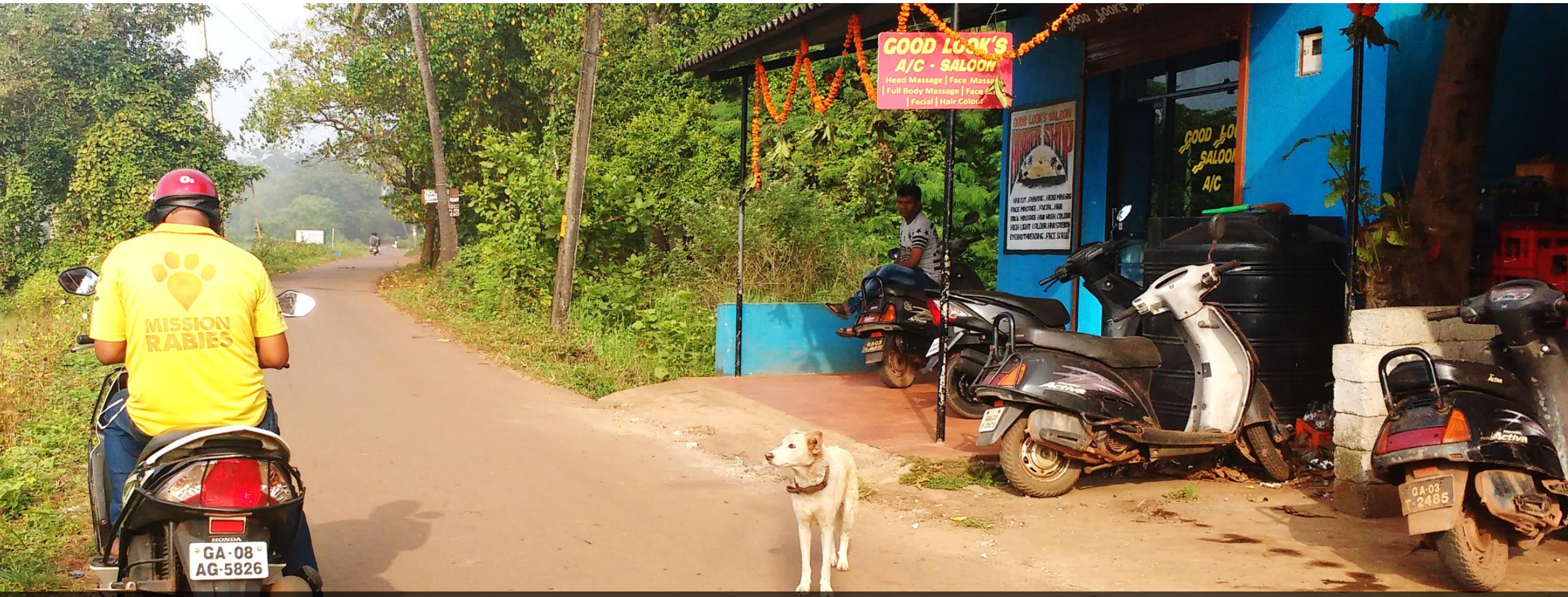


Post vaccination surveys

Dr Maurice Karani
Worldwide Veterinary Service

When to do a post-vaccination survey

- When initial population estimates are uncertain
- After vaccination campaigns to assess coverage
- When coverage is below target, identify gaps and barriers

Key things to consider:

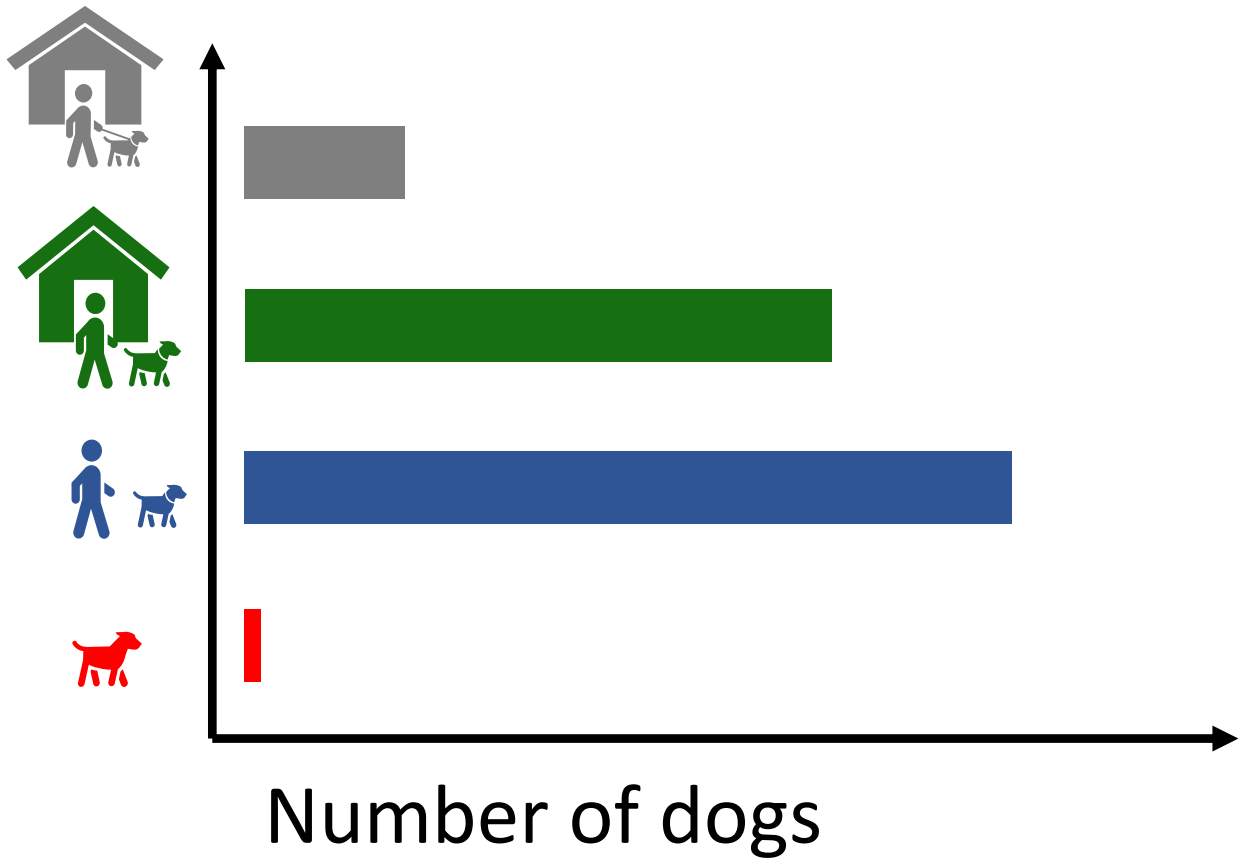
- Vaccination should proceed using best available estimates
- Post-vaccination surveys improve accuracy over time
- Iterative refinement strengthens programme efficiency

Vaccination & marking requirements:

- Mark vaccinated dogs (collars or paint)
- Record all vaccinated dogs (marked and unmarked)
- Capture ownership, location, and confinement status
- Ensure free-roaming marked population is clearly defined

Survey methods

- Direct street counts (free-roaming dogs)
- Household surveys (owned dogs)
- Combined approach preferred where feasible
- Ensure representative sampling (avoid bias near vaccination sites)




Majestic Pride | Offshore Casino in Goa
Ponte de Linhares Causeway
PATTO COLONY
Panjim Bus Stand
PATTO PLAZA
MALA
Panaji
ELECTRICITY COLONY
MERCES
Hotel Travellers Inn
CMM Arena Megastore
Ribandar
MANASWADA
DoubleTree by Hilton Goa - Panaji
Chimbel
Chimbel Waterfall
St. Augustine Tower
Ella
Bainguinim
St Cruz
CUJIRA WARD
Dempo College of Commerce & Economics
Dr.Antonio Gonsalves
SHIVAJI NAGAR
Talaulim
Goalim Moula
Goa Medical College, Bambolim Goa
Bambolim
BANDH VADDO
CABESA WARD
Goa University
Wet 'n Wild Goa
Curca
Goa Velha
Gancim
Bambolim Beach
Holy Cross Shrine
Bambolim Beach Resort
Siridao Beach
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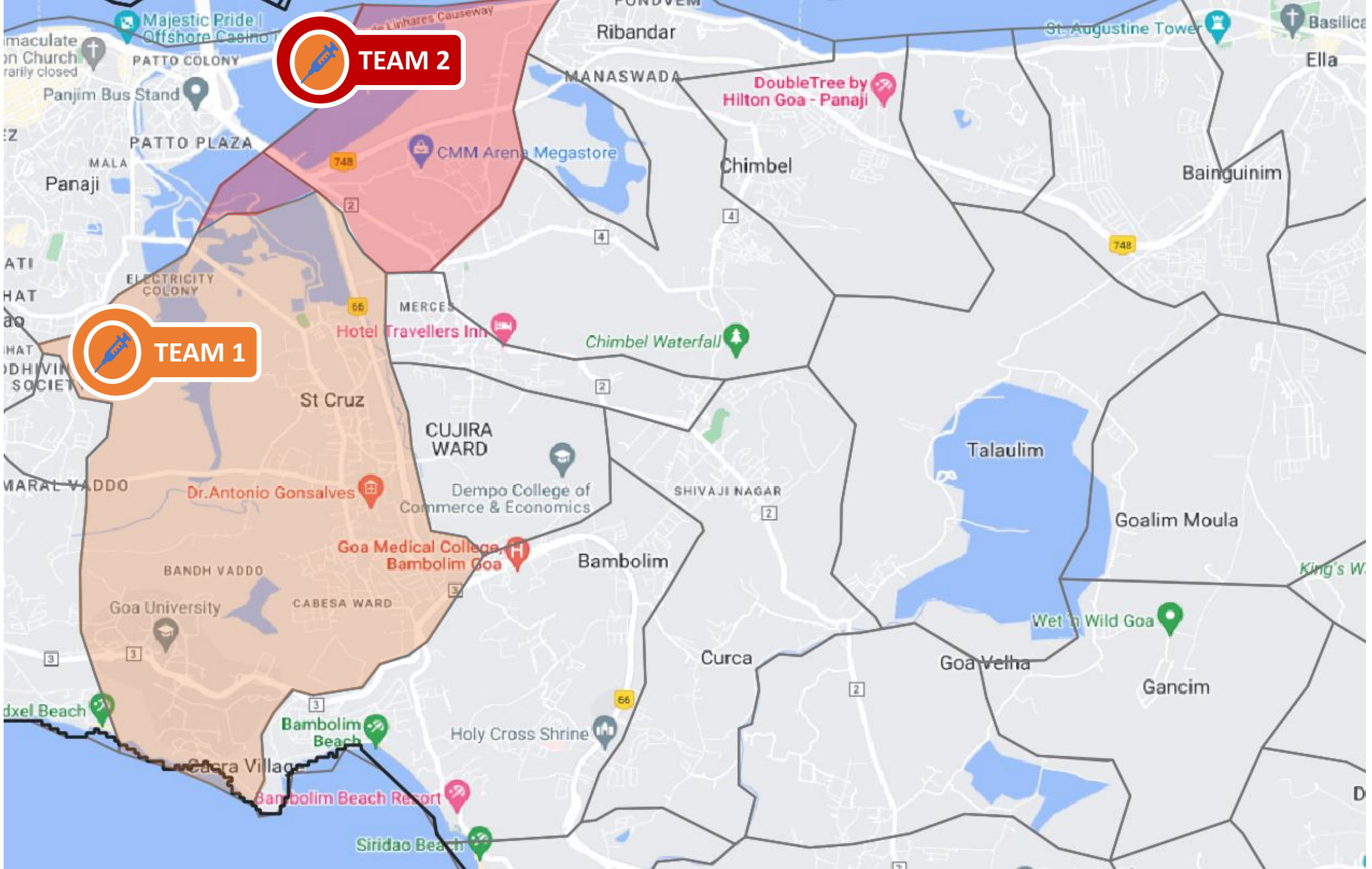
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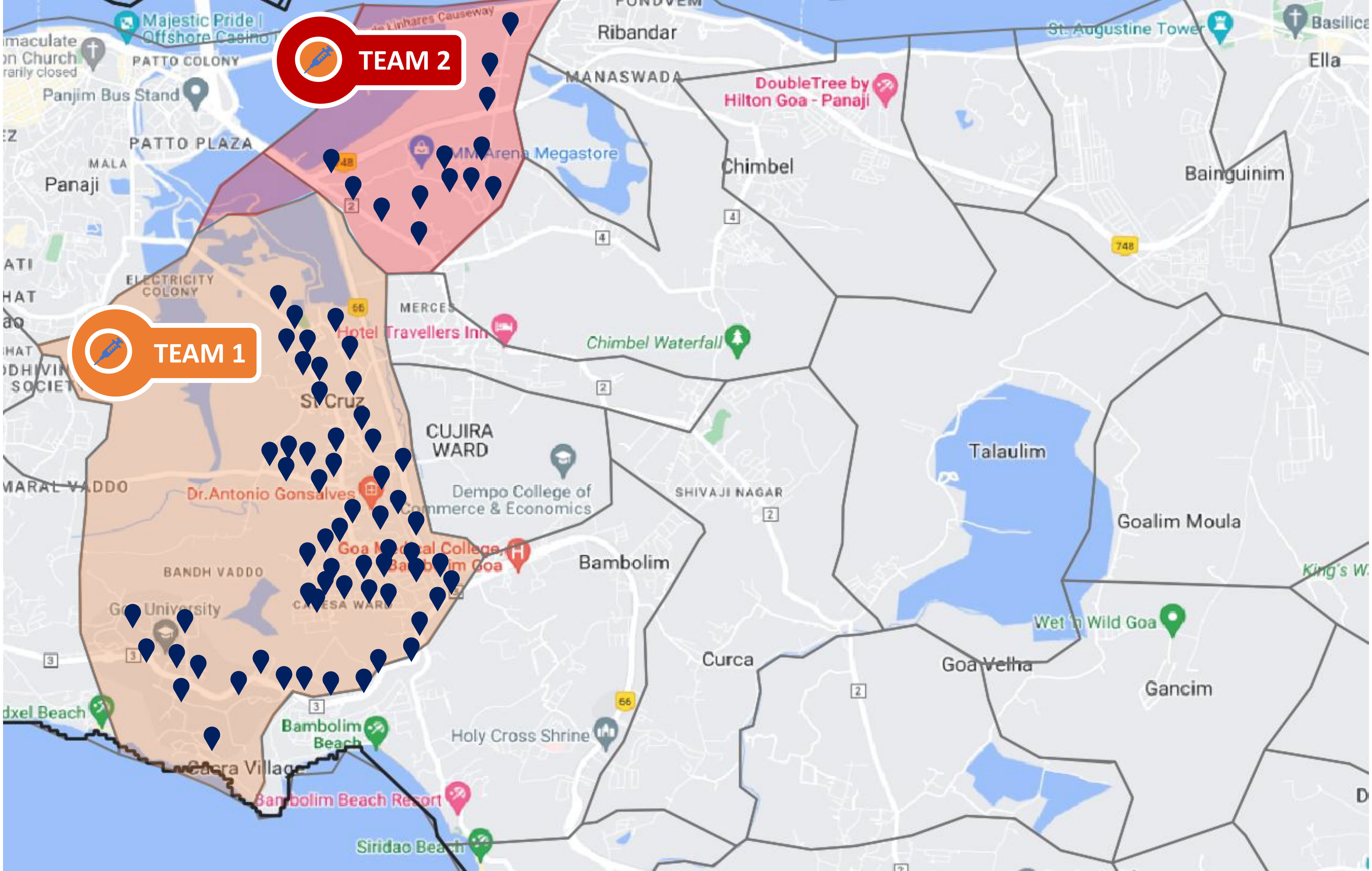
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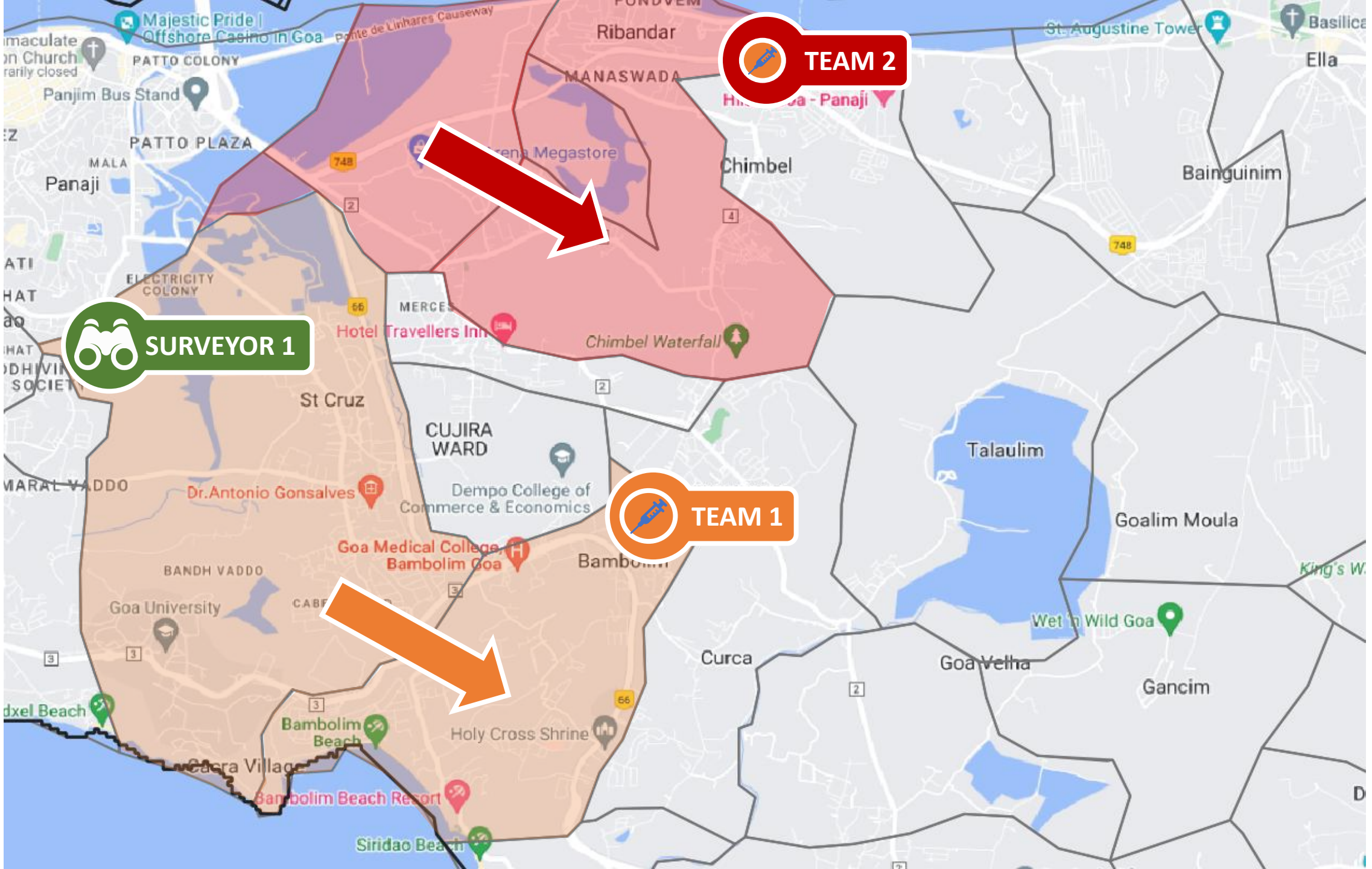
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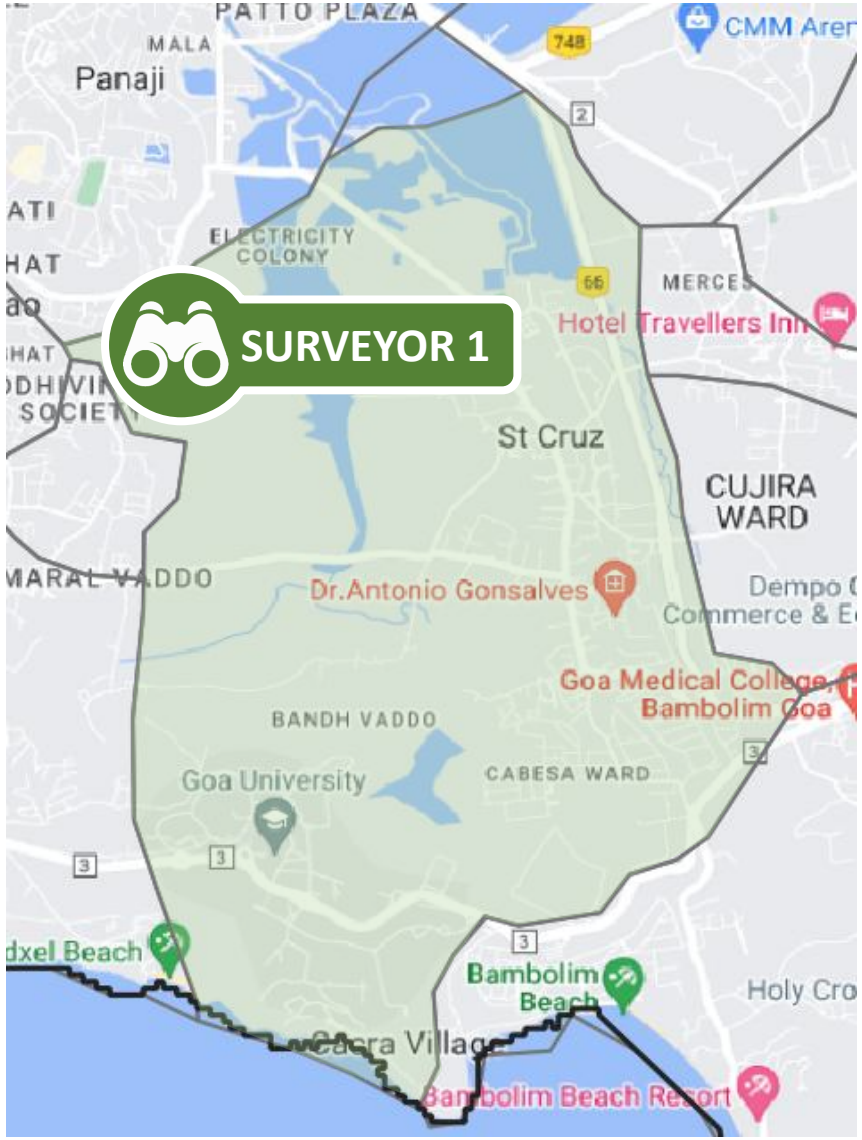
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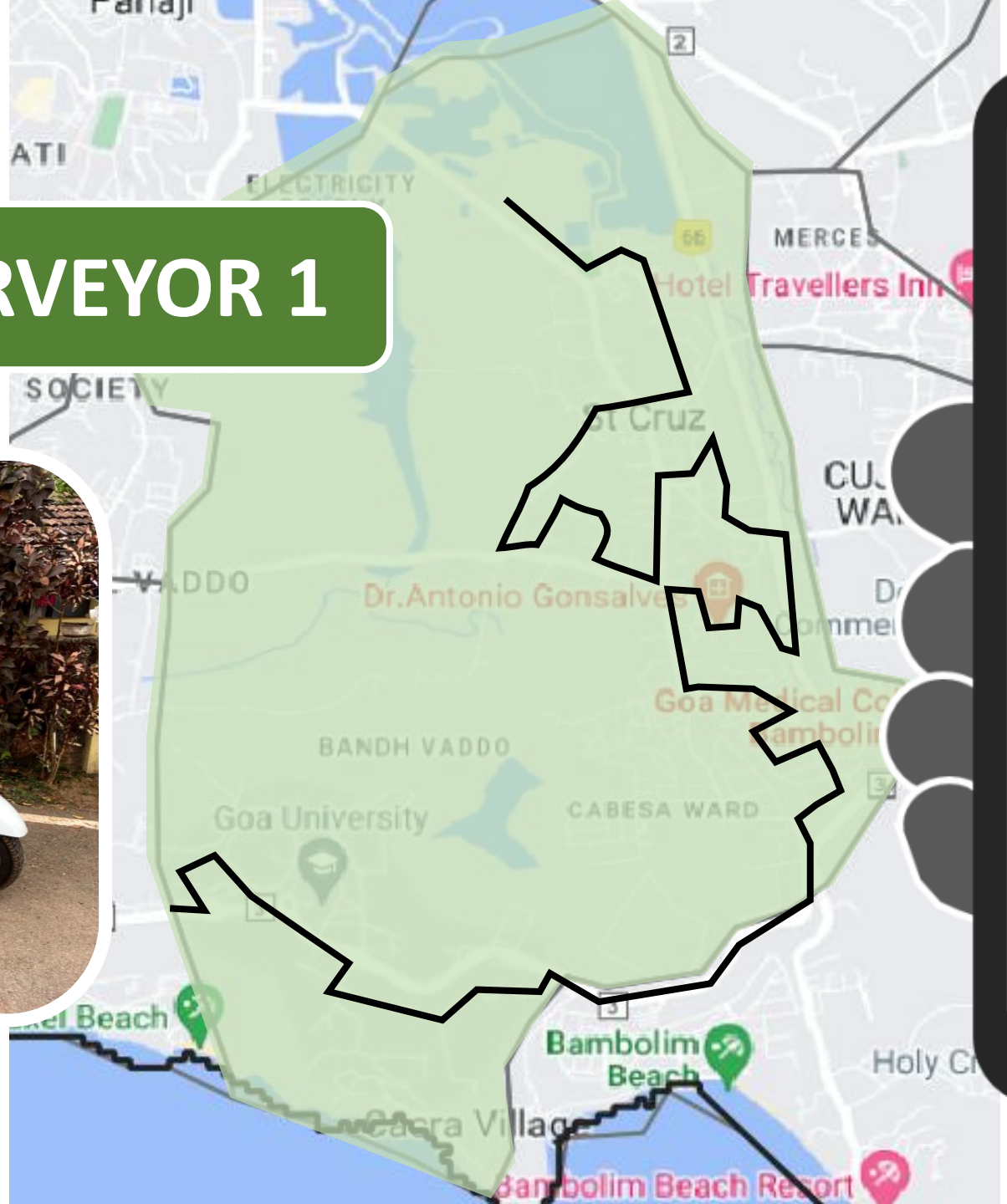
SURVEYOR 1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Goa University
CABESA WARD
Bambolim Beach
Bambolim Beach Resort


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WORLDWIDE VETERINARY SERVICE

Survey timing

- Conduct survey 24–72 hours post-campaign
- Allow behaviour normalisation (>24 hours)
- Minimise mark loss (<72 hours)
- Survey early morning or late evening

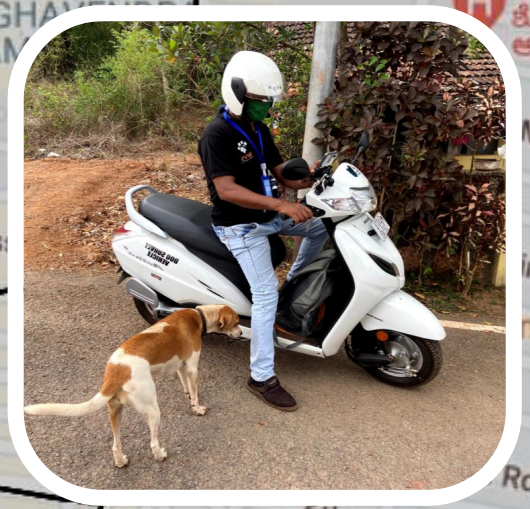
SURVEYOR 1


2021/07/30 16:04:57

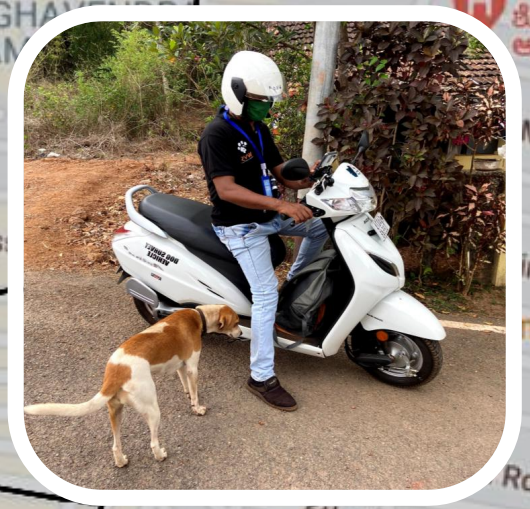
Key points

- Survey in days after vaccination
  - Marks only last 2-3 days
- Zig-zag route across zone
  - Roads should be representative of whole region
  - E.g. 20% main - 80% residential

Zig-zag to sample the whole zone



If the whole zone has 90% small inner roads, the survey should try to travel along the same proportion.




Day1 – 44%
Sri Mahadeshwara Temple
State Bank of India
17th Cross Rd
Raj Biryani
Birla Tisya
Asal Food Products Pvt
Dasara Halli Bus Stop
JM Circle
Veeresh Cinemas
DMart Vijayanagar
Care & Cure
B.B.M.P HOSPITAL
Isha Place - Vijayanagar
Shobha Hospital
Gayathri Hospital Pvt
Vijayanagar Food Street
New Shanthi Sagar
Indraprastha Hotel
Mangalore Kabab Korner
Sri Adichunchanagiri Mutt
HRI RAGHAVENDRA SWAMY TEMPLE
9th A Cross Rd
9th Cross Rd
6th Main Rd
5th Main Rd
4th Main Rd
3rd Main Rd
2nd Main Rd
7th Main Rd
8th Main Rd
11th Main Rd
6th Cross Rd
23rd Cross Rd
3rd Cross Rd
2nd Cross Rd
1st Cross Rd

Zone coverage?

- High variability in vaccination coverage between repeats
- Single surveys are not reliable at the zone level
- Average of multiple surveys provides reliable mean coverage across a region

Meunier *et al. BMC Veterinary Research* (2019) 15:190
https://doi.org/10.1186/s12917-019-1938-1

BMC Veterinary Research

RESEARCH ARTICLE Open Access

A comparison of population estimation techniques for individually unidentifiable free-roaming dogs

N. V. Meunier[1], A. D. Gibson[2,3], J. Corfmat[2], S. Mazeri[2,3], I. G. Handel[1], L. Gamble[2], B Mde C Bronsvoort[3] and R. J. Mellanby[1*]


Day1 – 44%
Day2 – 61%
Day3 – 56%
Sri Mahadeshwara Temple
State Bank of India
Raj Biryani
Birla Tisya
17th Cross Rd
Asal Food Products Pvt
Halli Bus Stop
Care & Cure
B.B.M.P. HOSPITAL
Veeresh Cinemas
Isha Place
Shobha Hospital
Bangalore One
Vijayanagar Food Street
New Shanthi Sagar
Sri Adichunchanagiri Mutt
Mangalore Kabab Korner
Indraprastha Hotel
9th A Cross Rd
9th Cross Rd
8th Main Rd
7th Main Rd
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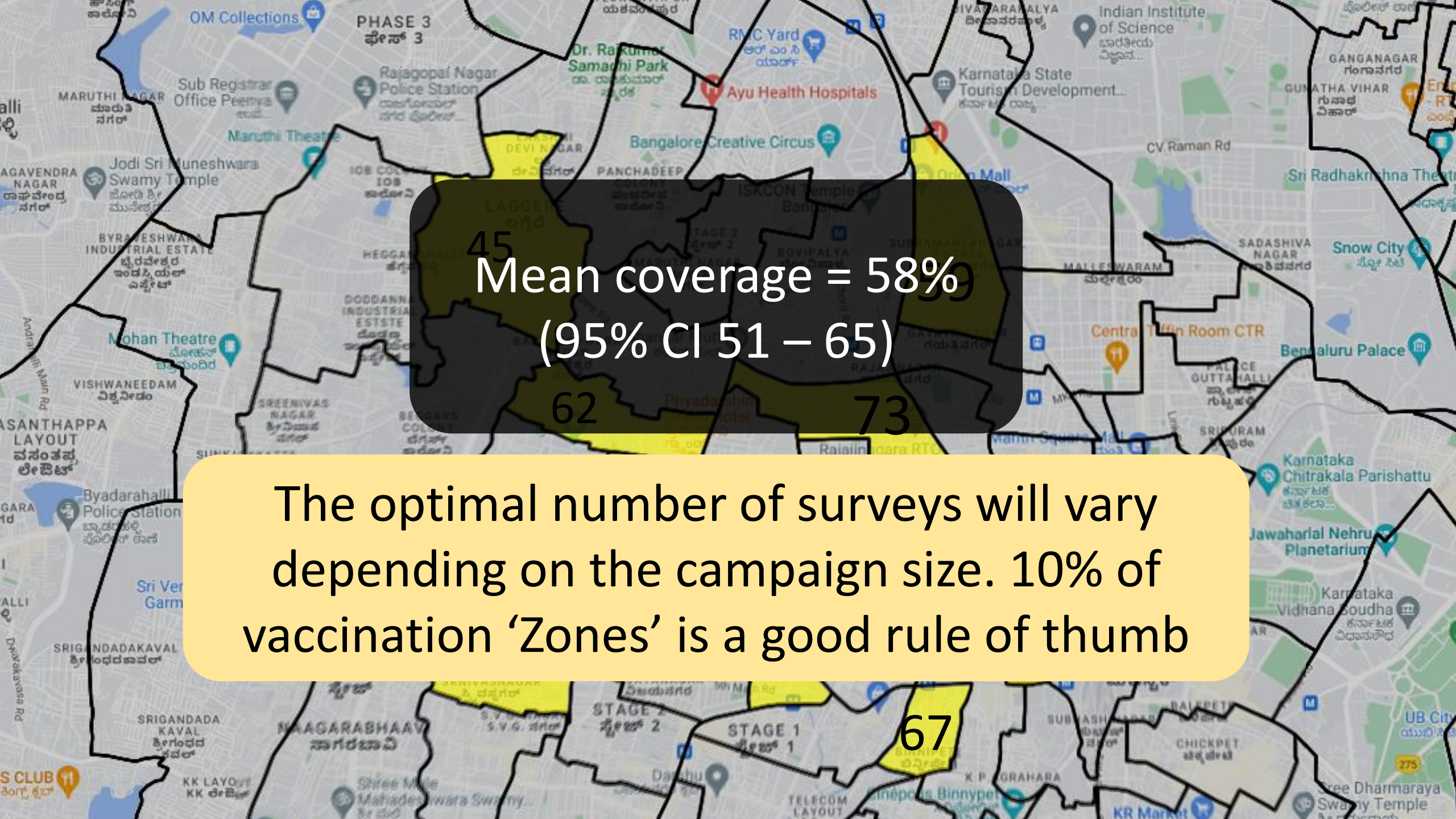
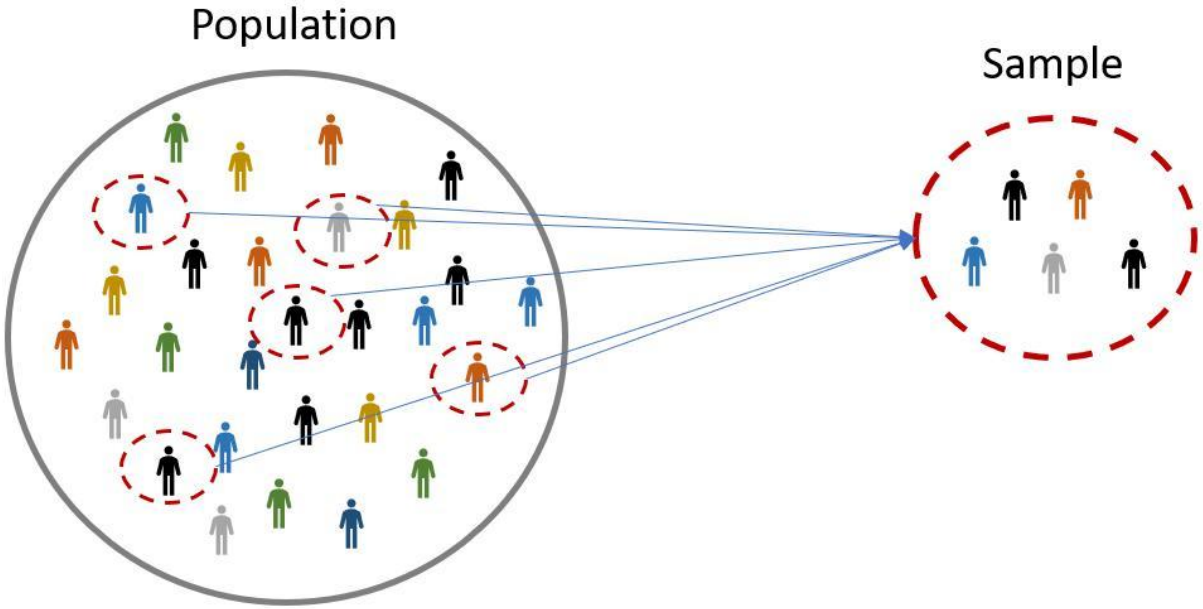
6th Main Rd
3rd Cross Rd
2nd Cross Rd
1st Cross Rd
23rd Cross Rd


Mean coverage = 58%
(95% CI 51 – 65)
45
62
73
67
The optimal number of surveys will vary depending on the campaign size. 10% of vaccination ‘Zones’ is a good rule of thumb

Sample size determination

- Minimum sample size:
- n = 96 / (1 + (96/N))
- Provides 95% confidence within ±10% precision
- Use rough population estimate (N for calculation



PV surveys can provide approximate population estimates

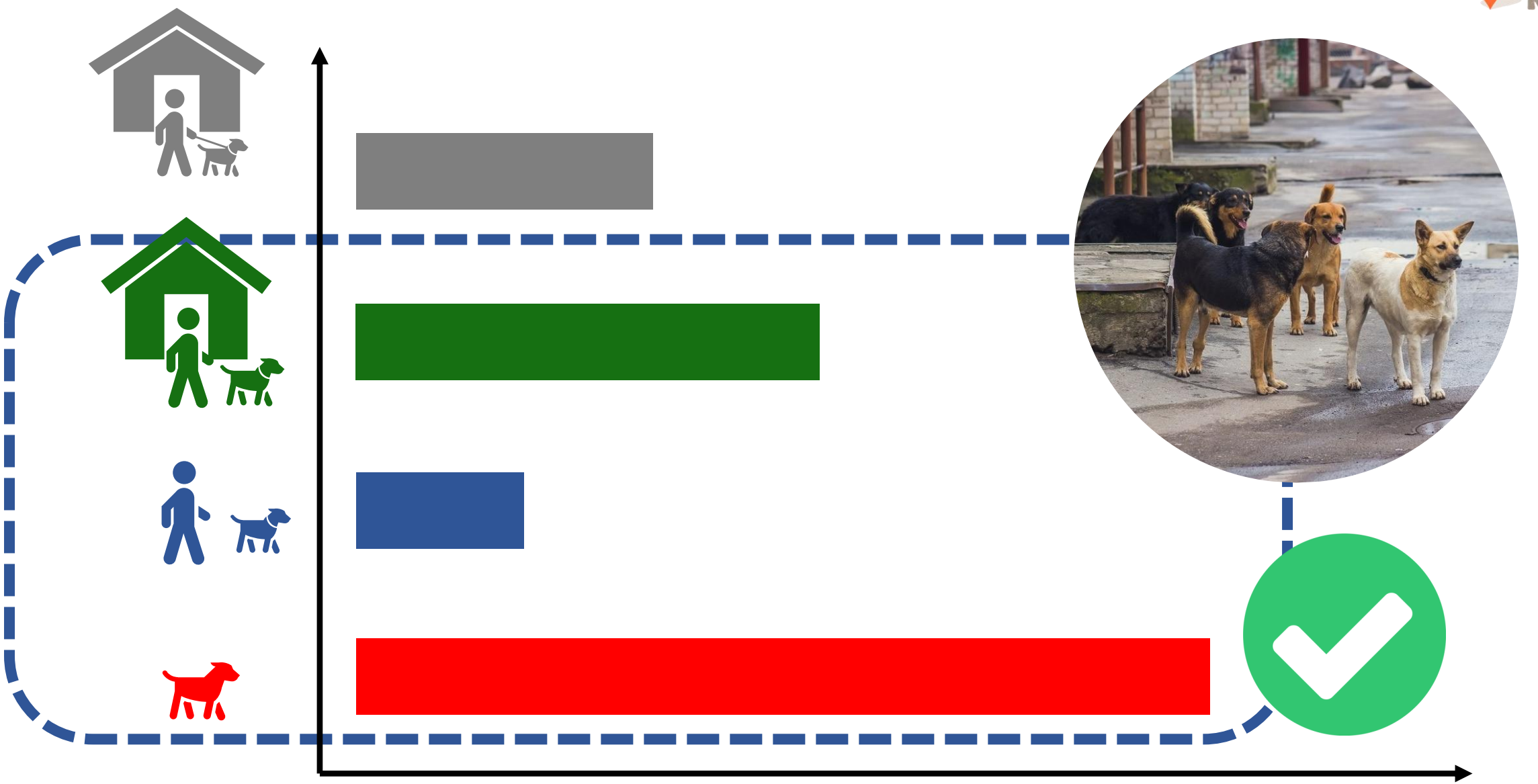
- A campaign **vaccinate 4,395** dogs
- A total of **2,741 dogs** are sighted on pv surveys.
- Of dogs seen on pv surveys, **1,932 dogs** are vaccinated.

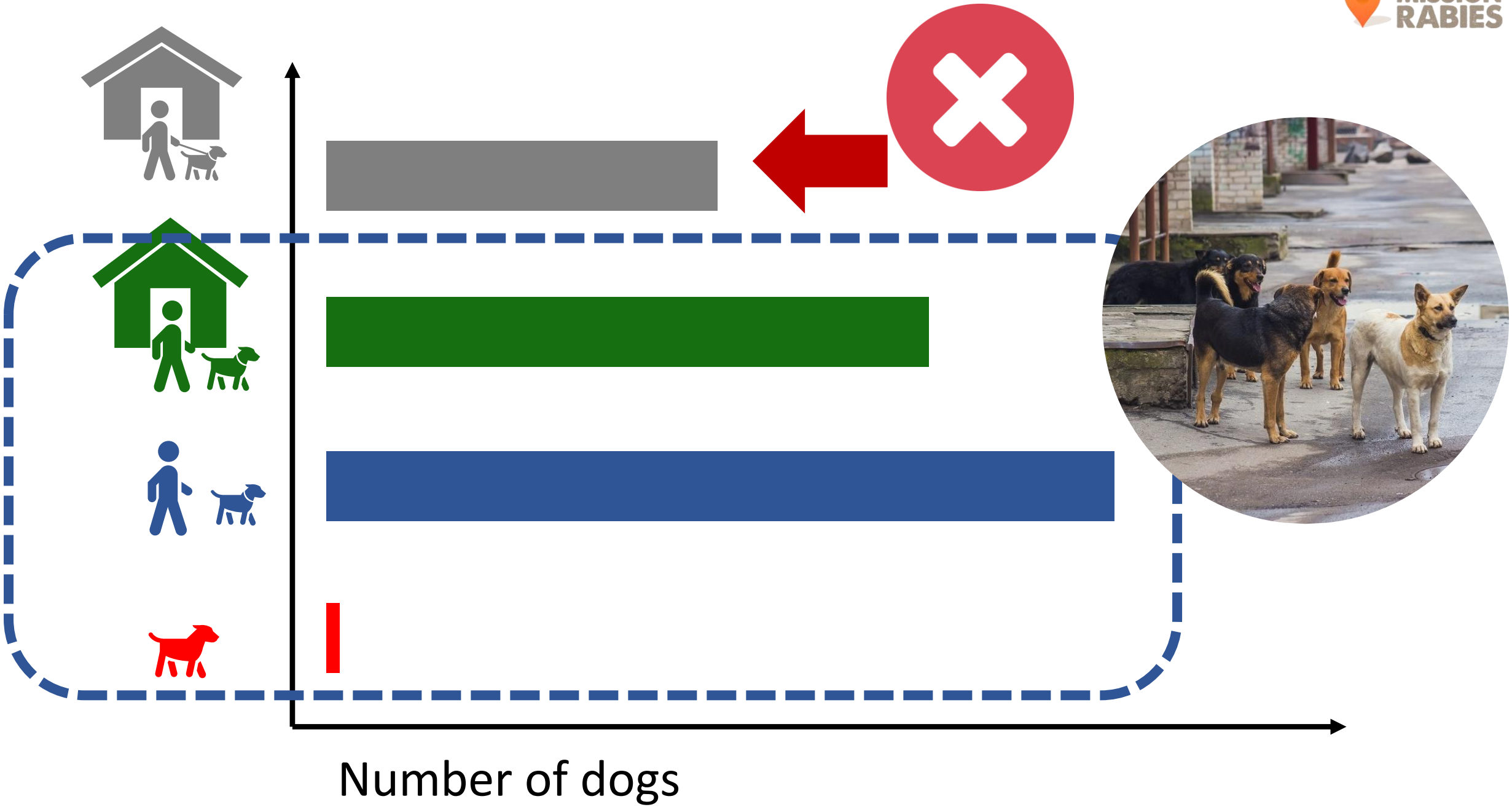
$$\text{Total population} = \frac{(\text{Total vaccinated})\quad(\text{Total sighted})}{(\text{Total vaccinated dogs sighted})}$$

PV surveys can provide approximate population estimates

- A campaign **vaccinate 4,395** dogs
- A total of **2,741 dogs** are sighted on pv surveys.
- Of dogs seen on pv surveys, **1,932 dogs** are vaccinated
- Lincoln–Petersen estimator:

$$\text{Total population} = \frac{(4{,}395)\ (2{,}741)}{(1{,}932)} = 6{,}235$$


Number of dogs


Number of dogs

Consistent method across surveys is crucial

- Things we can't control:
  - Dog location
  - People's behaviour
  - Weather
- But we can be **consistent** in what we can control:
  - Survey methods
  - Speed of travel
  - Time of survey

Timing is everything

8

Timing is everything

3

Timing is everything

1

Avoid contact

- DO NOT call the dogs towards you or make any noises
- Do not stroke or pet the dogs
- NEVER FEED the dogs in the study areas (whether surveying or not)
- Dogs have good memories and over time may grow to either like or avoid the surveyor – this would invalidate the results of our study

Thank you!!!

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MISSION RABIES