Changing Bad Behaviour to Good

How the art of behaviour change can bolster biosecurity

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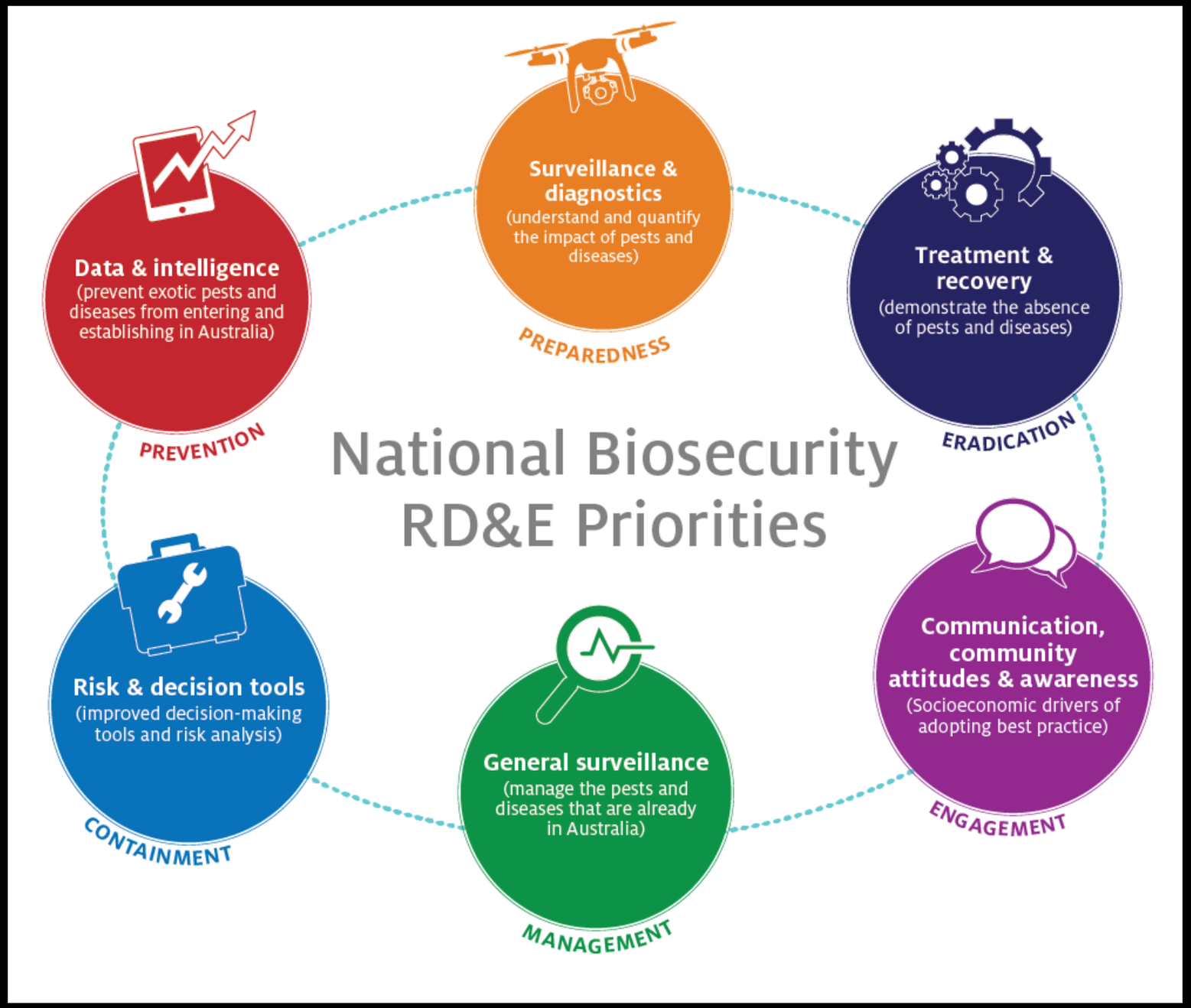
CENTRE FOR INVASIVE SPECIES SOLUTIONS

Australia has some of the best biosecurity practices in the world



But threats are increasing, even the best biosecurity strategies and practices will be ineffective if people fail to adopt them

And unfortunately when it comes to biosecurity breaches, the world is full of bad actors

Pistol and Boo are just the tip of the iceberg

THE WEIRDEST THINGS SEIZED AT BRISBANE AIRPORT

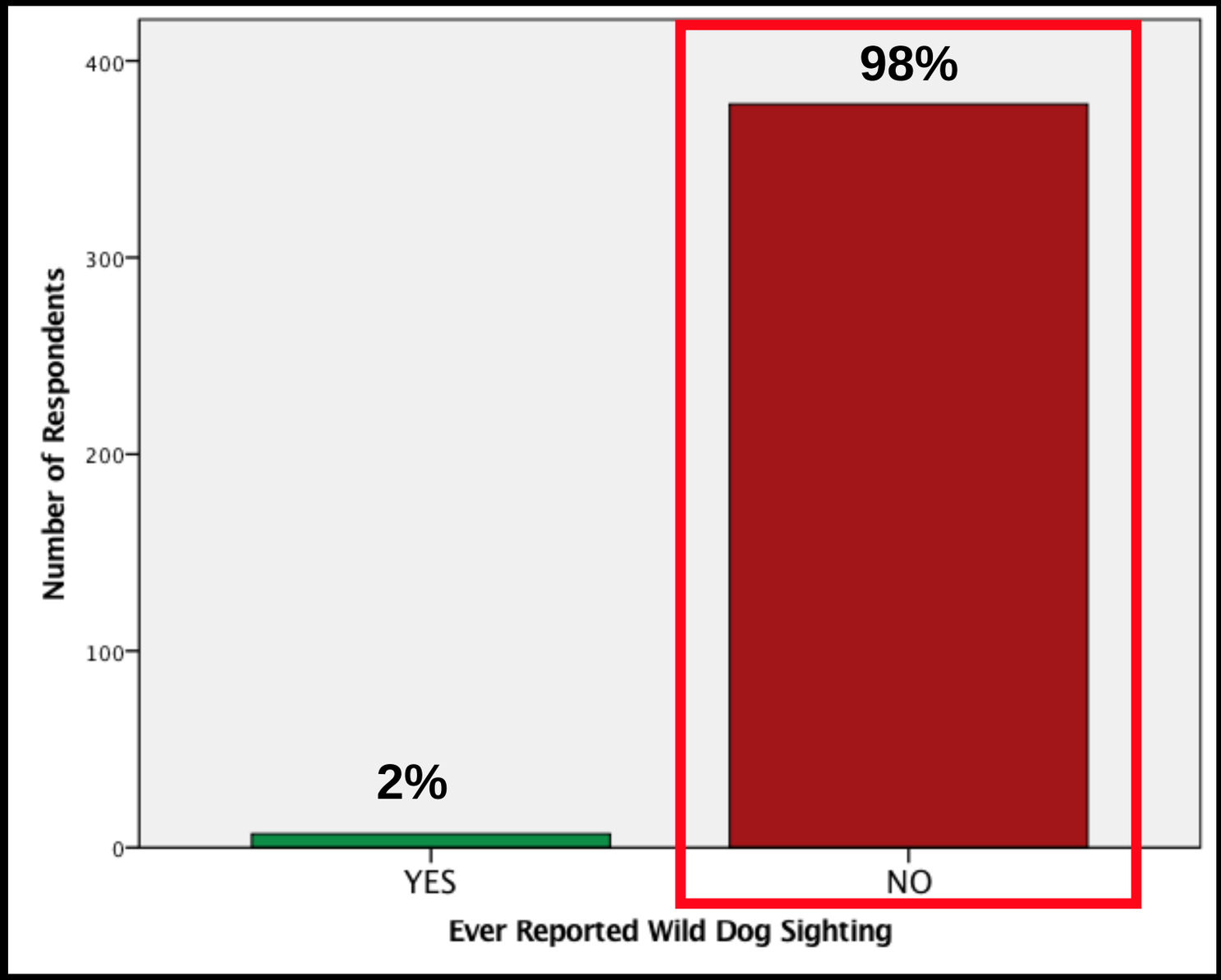
FROM this bizarre crucified bat to snakes, faeces, giant snails and massive beetles, Brisbane Airport staff seized 35,000 dangerous goods overseas passengers last year.

Feature from the Courier Mail, March 2018

Airports and other ports of entry

Reporting Peri-Urban Wild Dogs and Impacts

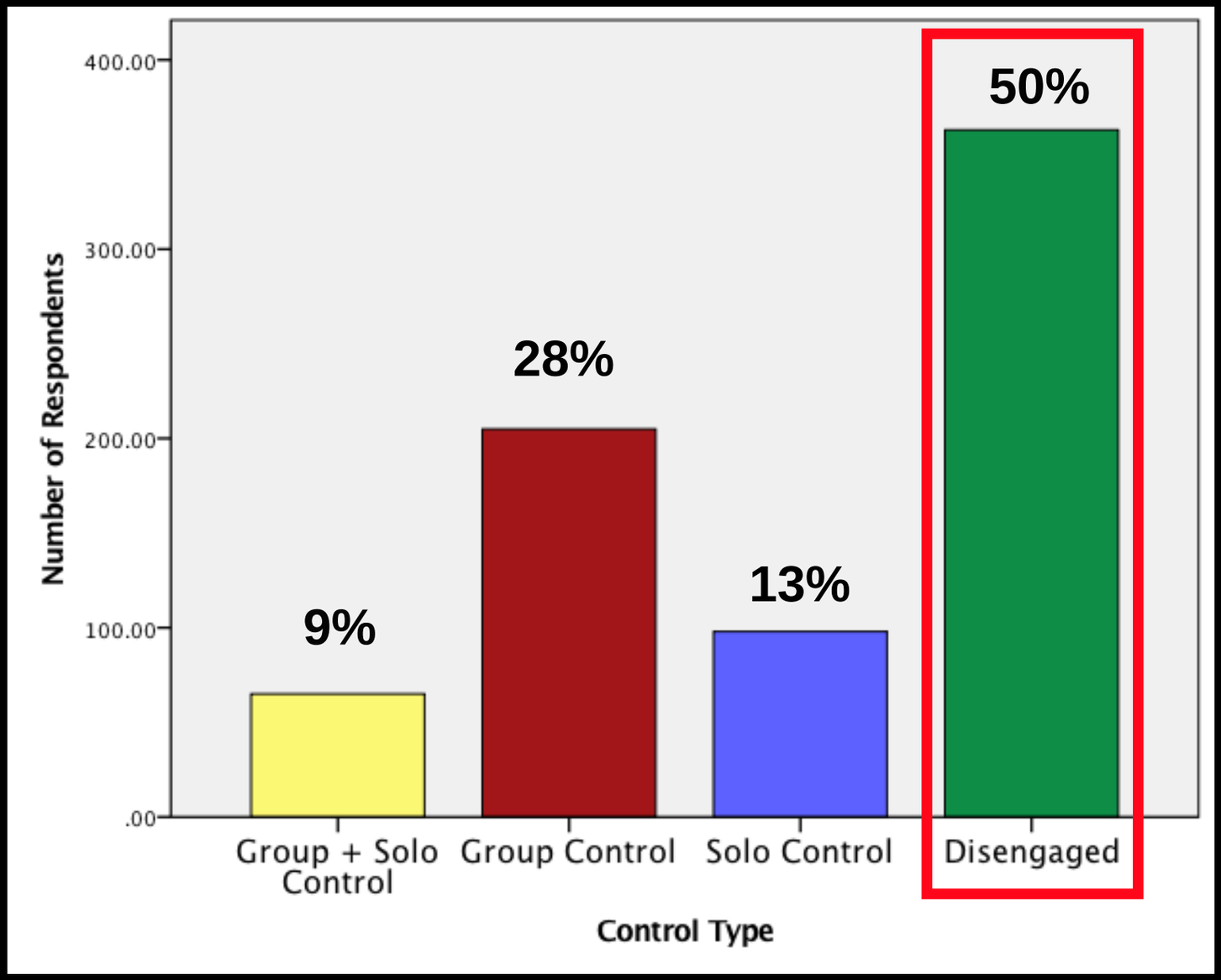
Despite wild dogs being common in the region and Council wanting people to report, very few people do.



Random digit dial survey of 385 Peri-Urban Gold Coast City Residents

Hine, D.W., McLeod, L.J., & Please, P.M. (under review). Using audience segmentation to increase reporting of wild dog impacts in peri-urban settings. *Society and Natural Resources*.

Participation in Pest Animal Control Activities (Western Australia - DAFWA)



Half the sample had not engaged in any pest animal control activities during the past 12 months

Random digit dial survey of 731 land managers from WA

McLeod, L.& Hine, D.W (2019). Using audience segmentation to understand non-participation in invasive mammal management in Australia. *Environmental Management.*

“Less than half of all [NSW] primary producers (47%) have a biosecurity plan in place and even fewer (32%) have a cash reserve to deal with an emergency biosecurity problem .”

–Biosecurity Attitudinal Research Report, prepared by Colmar Brunton for NSW Department of Primary Industry, March 30, 2017.

Pest animals

Cost to Australian agriculture:
Up to 800 million per year

McLeod, R. (2016). Cost of Pest Animals in NSW and Australia, 2013-14. eSYS Development Pty Ltd, 2016. Report prepared for the NSW Natural Resources Commission

Weeds

Cost to Australian agriculture:
$4.8 billion per year ($13 million per day)

So what exactly is the problem?

- There are a substantial number of people who are engaging in behaviours that run counter to Australia's biosecurity interests.

This represents a serious threat to the economy, the environment, and local communities.

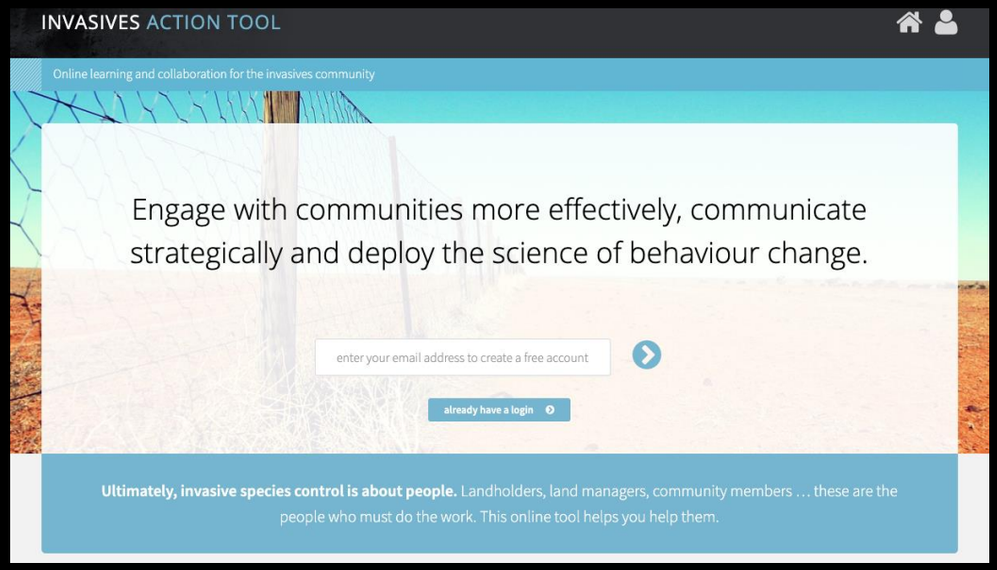
Man trying to smuggle live squirrels into the Brisbane airport

Invasive Animals CRC

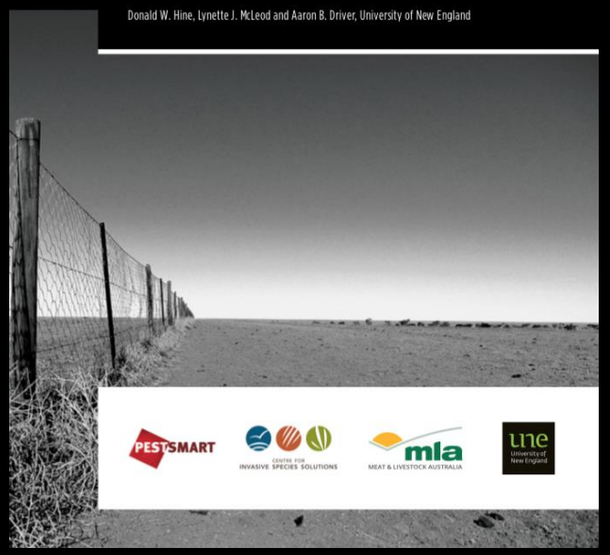
CENTRE FOR INVASIVE SPECIES SOLUTIONS

How do you get people to fulfil their biosecurity obligations?

Behaviourally Effective Communications for Invasive Animals Management: A Practical Guide

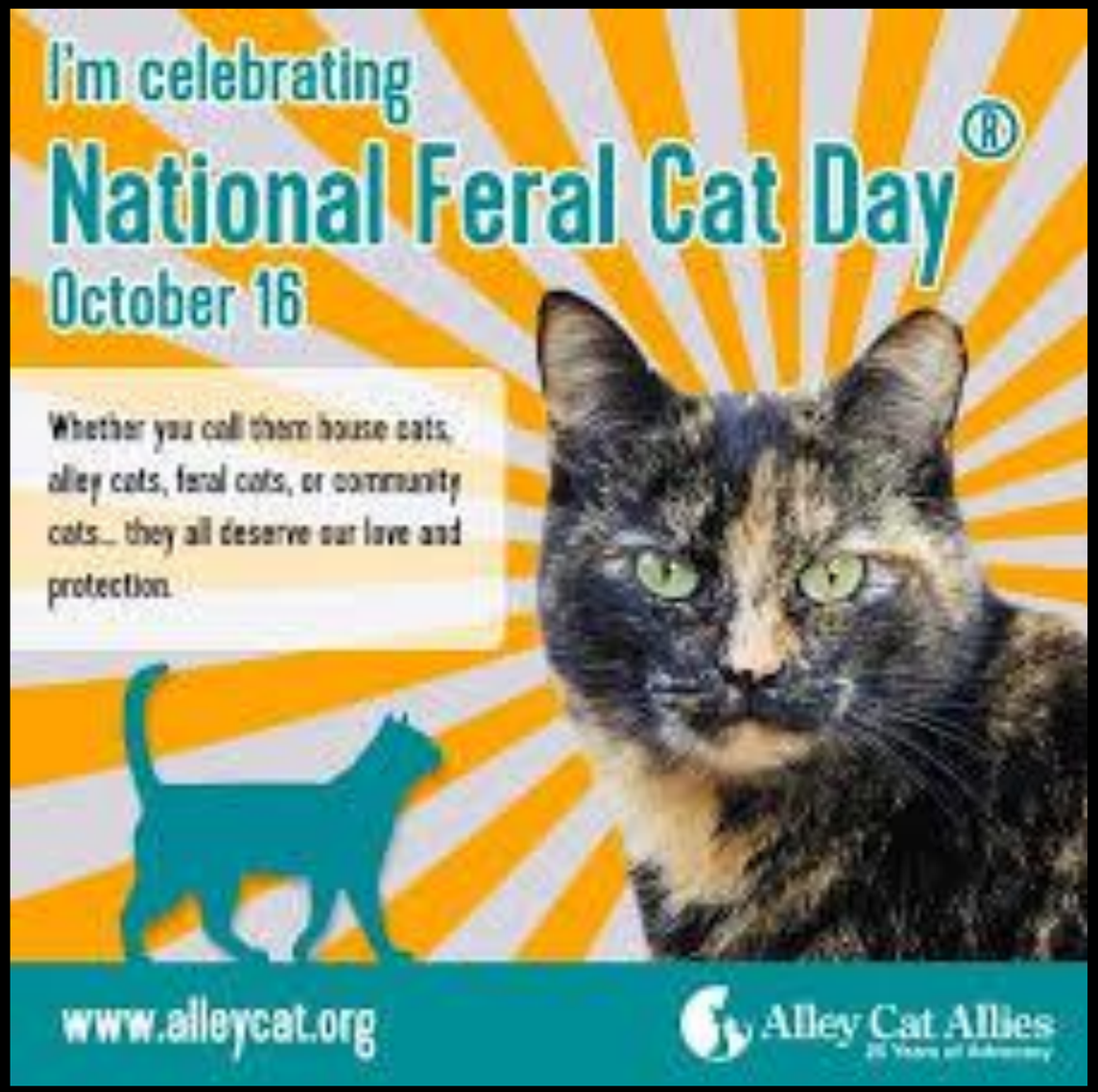


Designing Behaviour Change Interventions for Invasive Animal Control: A Practical Guide



Four Key Principles…

1. Focus on behaviour
2. Know your audience
3. Match interventions to the primary causes of behaviour
4. Employ rigorous, science-based evaluation



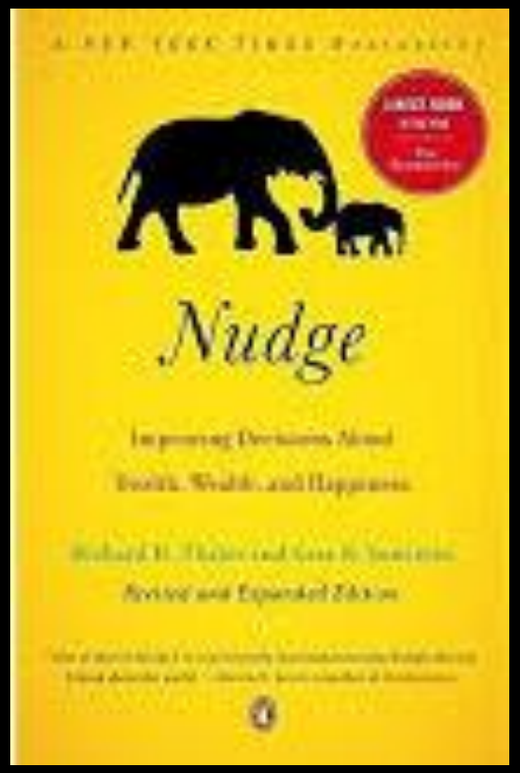
PRINCIPLE 1: FOCUS ON BEHAVIOUR

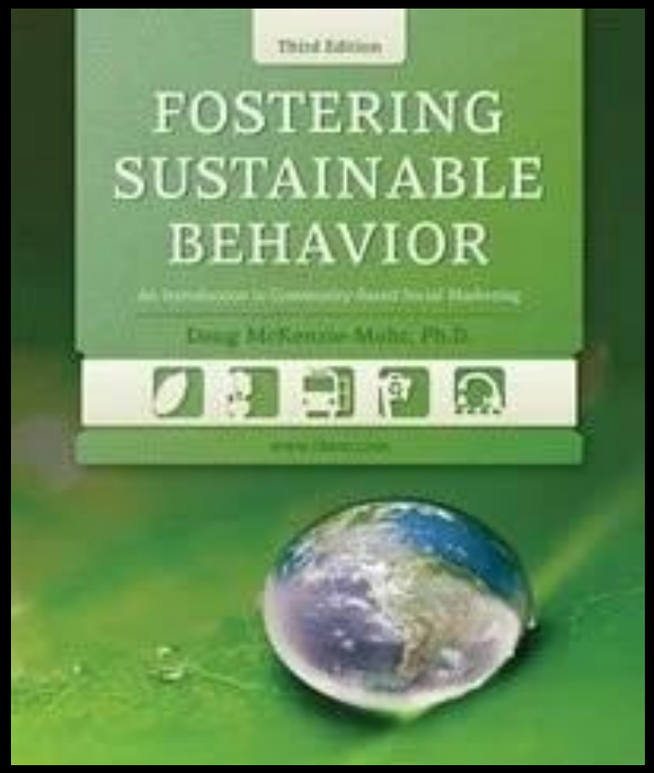
Many human dimensions programs aim to increase awareness of biosecurity threat and/or change attitudes.

But… we don’t just want people to be aware of or have positive attitudes about “best practices” in biosecurity. We want them to ACTUALLY ENGAGE in these practices.

Attitude Change +
<u>Awareness</u>

≠ Behaviour Change





Effective biosecurity requires a more sophisticated understanding of human behaviour and how it can be changed.

A simple framework for identifying high impact behaviours

Behavior	Effectiveness in Reducing Biosecurity Threat	Probability of Adoption	Current Penetration	Selection Decision
1	High	High	High	No
2	High	High	Low	Yes

Many behaviour change projects fail because they attempt to change the wrong behaviours.

Based on McKenzie-Mohr (2011). Fostering sustainable behavior: An introduction to community-based social marketing. Gabriola Island: New Society Publishers.

Behaviour Prioritisation Matrix: Managing wild dogs in peri-urban areas

Behavior	Effectiveness (1-10)	Probability of Adoption (0-4)	Current Penetration (0-4)	Weighted Impact
Report dog sightings and impacts (1/15)	5.83	3.00	0.93	68.74
Fence/contain pets (4/15)	5.75	3.00	2.54	34.72
Permit use of cyanide ejectors (5/15)	7.39	1.40	0.73	21.58

Selected behaviours only (15 behaviours evaluated in total).

Please, P. M., Hine, D. W., Skoien, P., Phillips, K. L., & Jamieson, I. (2018). Prioritizing community behaviors to improve wild dog management in peri-urban areas. Human dimensions of wildlife, 23(1), 39-53.

Key Takeaways

1. Don’t assume increasing awareness and changing attitudes will lead to behaviour change.

2. Identify “high impact” behaviours that:

   a. Most people are not already doing

   b. Most people are willing to do, if given the opportunity

   c. Our best available science indicates will be effective if most people engage in the behaviour.

PRINCIPLE 2: KNOW YOUR AUDIENCE

People vary considerably in terms of their values, attitudes, beliefs and behaviours. These differences influence how they respond to biosecurity engagement strategies.

Audience Segmentation

Audience segmentation involves dividing a target population into sub-groupings, called segments, usually based on some combination of demographics, values, beliefs and behaviours.

Why Segment?

- Segmentation helps engagement specialists to make four important strategic decisions:

1. **Who should be targeted?** General intervention to target everyone or targeted interventions for specific subgroups?

2. **How to optimise messages and interventions for each audience?** Some audiences lack knowledge. Some lack specific skills. Some may lack motivation.

3. **How to select the best "communication channels" for reaching each audience?** Social media, print media, email newsletters, radio, free TV?

4. **How to choose appropriate messengers?** Messengers with relevant expertise, values, and personal experiences needed to build and maintain trust with their audiences.

There are an infinite number of ways to segment an audience. Which attributes should you use?

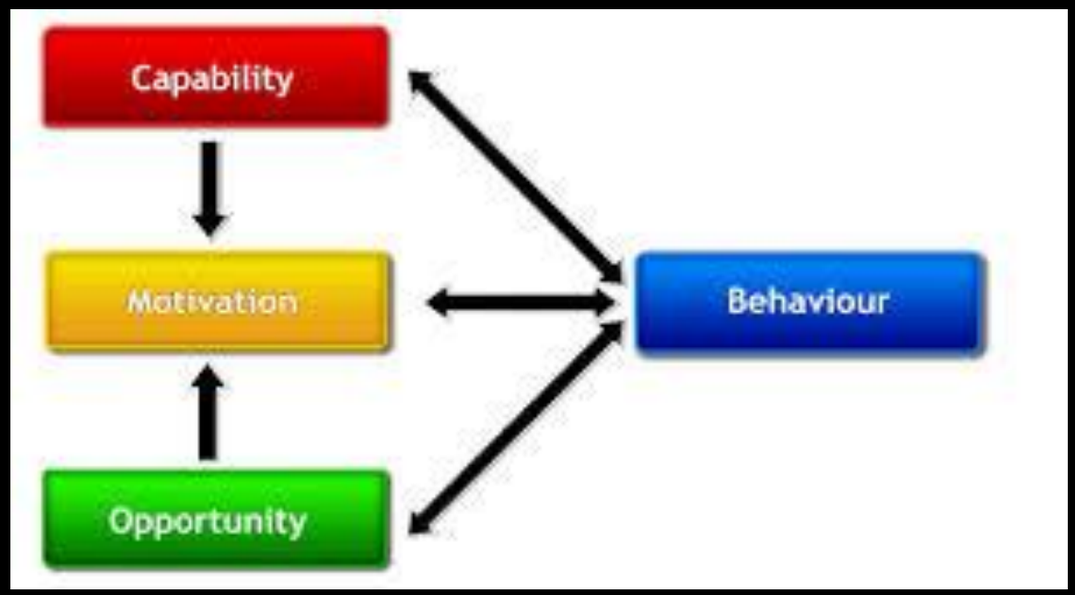
COM-B Framework

- 3 main determinants of behaviour

1. **Capability:** Do landholders have have relevant knowledge, skills, and physical capacity to engage in the target behaviour? Do they know the best management strategies? Are they physically able to hunt, trap and bait?

2. **Opportunity**: Are situational conditions present to support the target behaviour?, Are relevant institutional structures and laws in place? Are appropriate control technologies –baits, ejectors, viruses – readily available?

3. **Motivation**: Are landholders sufficiently motivated to take action? Are they aware of relevant biosecurity threats in their region? Do they have the right combination of values, attitudes, and beliefs to take action? Are the right incentives in place?



Michie et al. (2014). ***The behaviour change wheel: A guide to developing interventions*****. London: Silverback.**

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Review

Applying behavioral theories to invasive animal management: Towards an integrated framework

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ABSTRACT

Invasive species wreak an estimated $1.4 trillion in damages globally, each year. To have any hope of reducing this damage, best-practice control strategies must incorporate behavior change interventions. Traditional interventions, based on the *knowledge-transfer* model, assume that if land managers are properly educated about risks and strategies, they will develop supportive attitudes and implement appropriate control strategies. However, the social sciences have produced a large number of behavioral models and frameworks that demonstrate that knowledge transfer, by itself, fails to change behavior. The challenge then lies in knowing which behavioral model to choose, and when, from a potentially overwhelming 'universe'. In this paper, we review nine behavior theories relevant to invasive species management. We then introduce the *Behavior Change Wheel* as a tool for integrating these theories into a single practical framework. This framework links drivers of and barriers to behavior change with intervention strategies and policies, in what we consider, from an applied perspective, to be an important advance.

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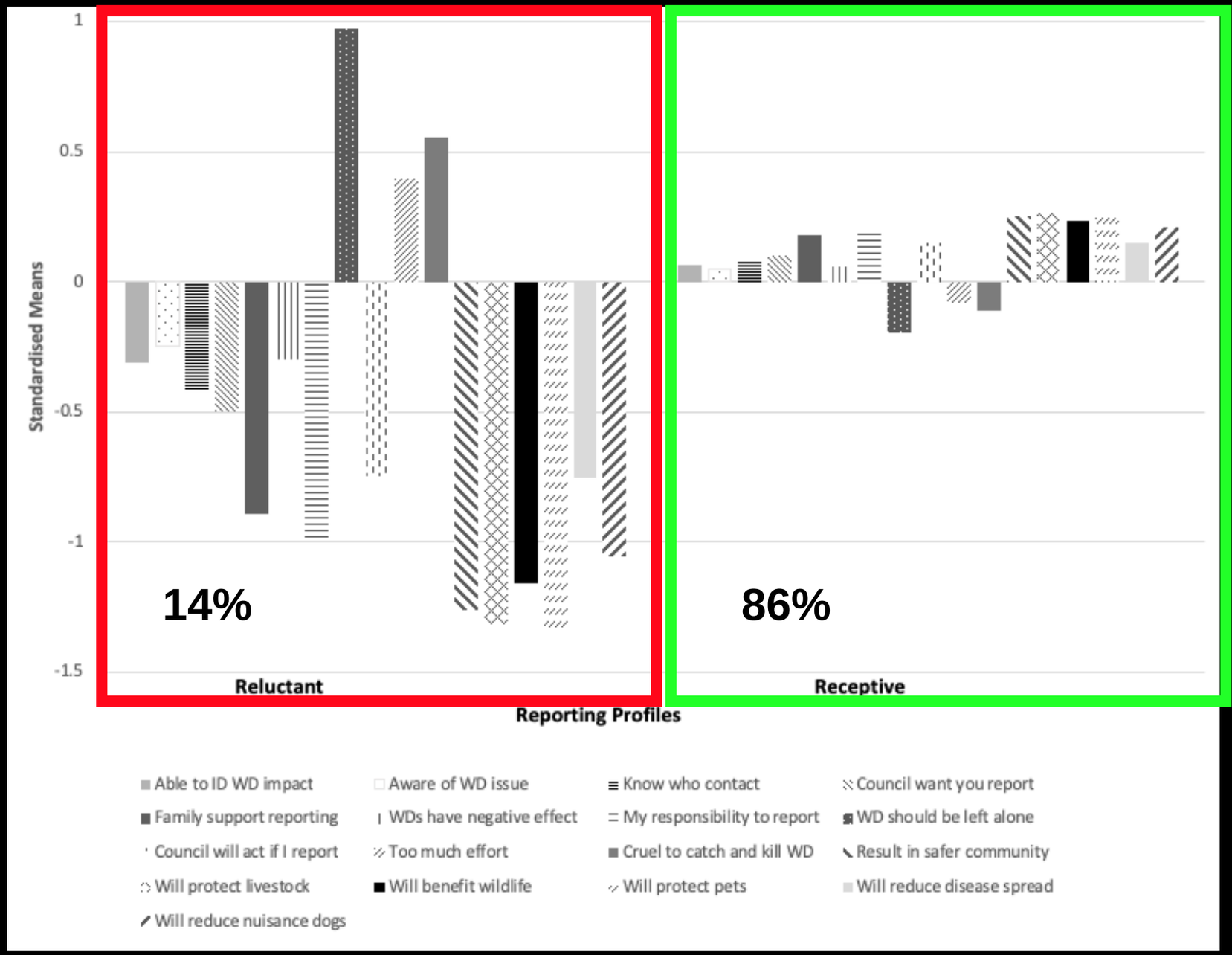
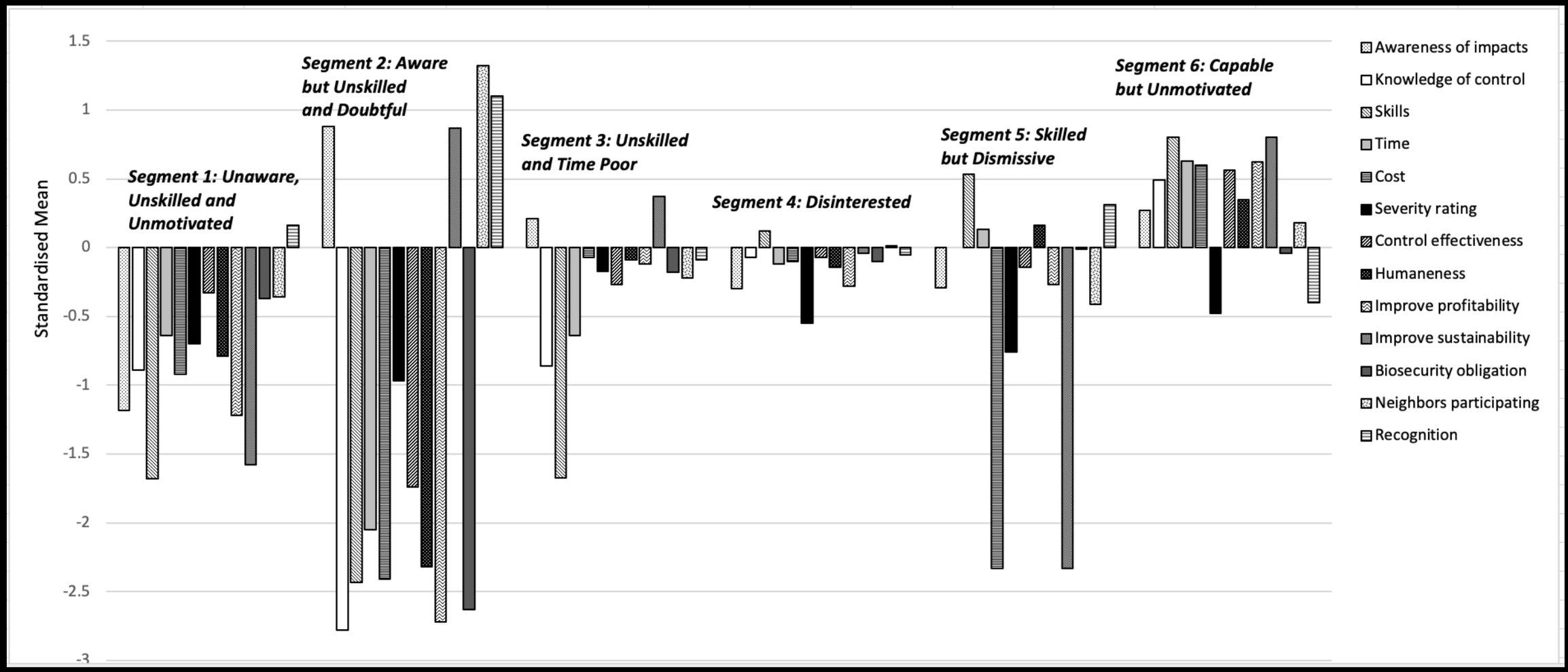
In a recent paper, we reviewed behavioural theories related to invasive animals control, and demonstrated that all of the theoretical variables could be re-classified into the COM-B framework.

Peri-Urban Wild Dogs: Heterogeneity in Non-Reporters



Segmented on 20 COM-B questions related to perceived drivers/barriers to reporting wild dog sightings and impacts.

Non-Participators in Western Australia



6 distinct segments that vary as function of awareness, capability, opportunity and motivation

McLeod, L.& Hine, D.W (2019). Using audience segmentation to understand non-participation in invasive mammal management in Australia. *Environmental Management.*

Key takeaways

When engaging with the public on biosecurity-related issues, it is critical to:

1. Understand the Capabilities, Opportunities, Motivations, and Behaviours of your target population.

2. Identify the number and nature of distinct audience segments with which you are engaging.

3. Recognise that diversity is the norm, not the exception!

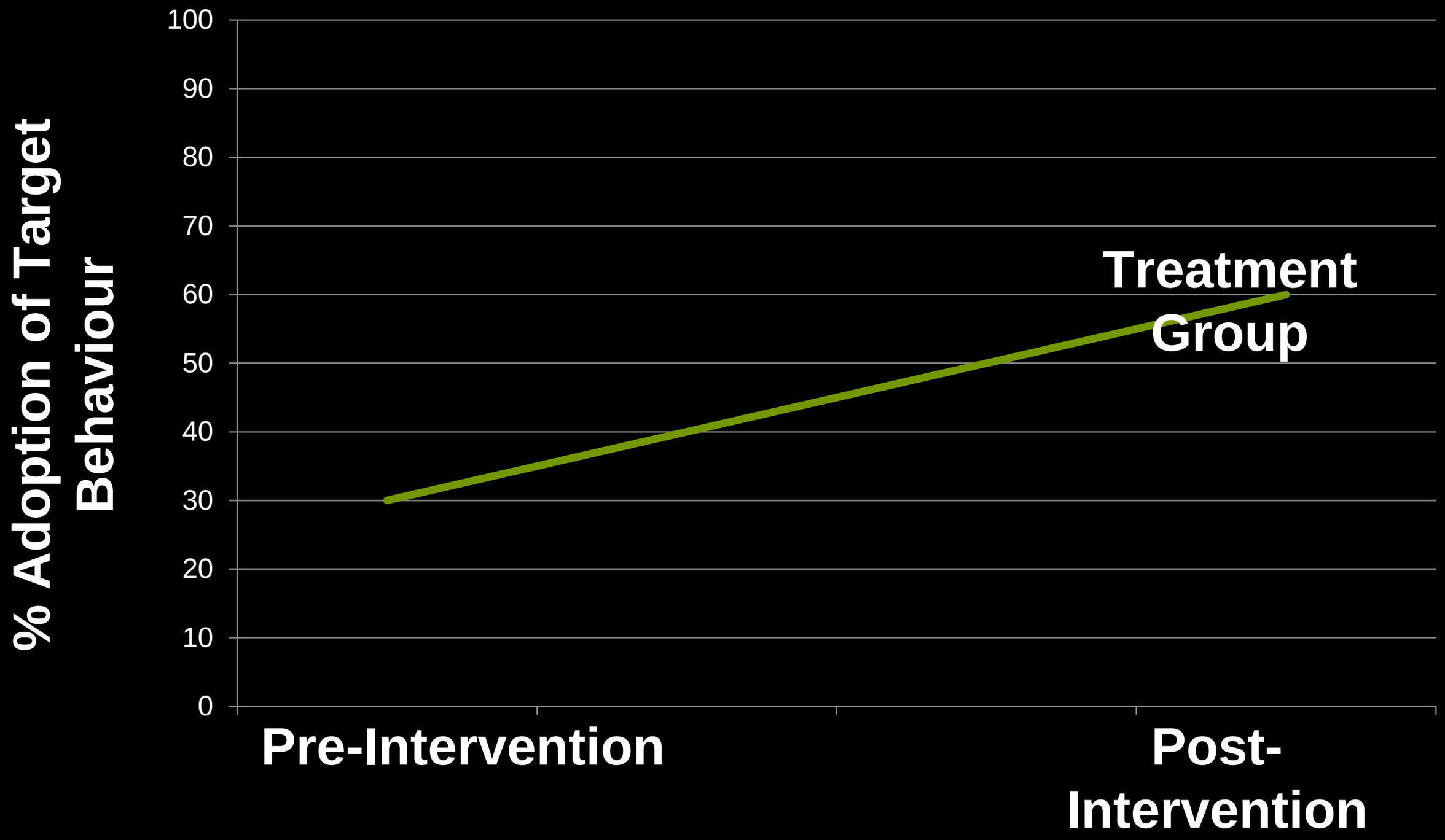
https://blog.cofound.it/introducing-the-cofound-it-evaluator-beta-program-c79460388f49

PRINCIPLE 4: APPLY RIGOROUS, SCIENCE-BASED EVALUATION

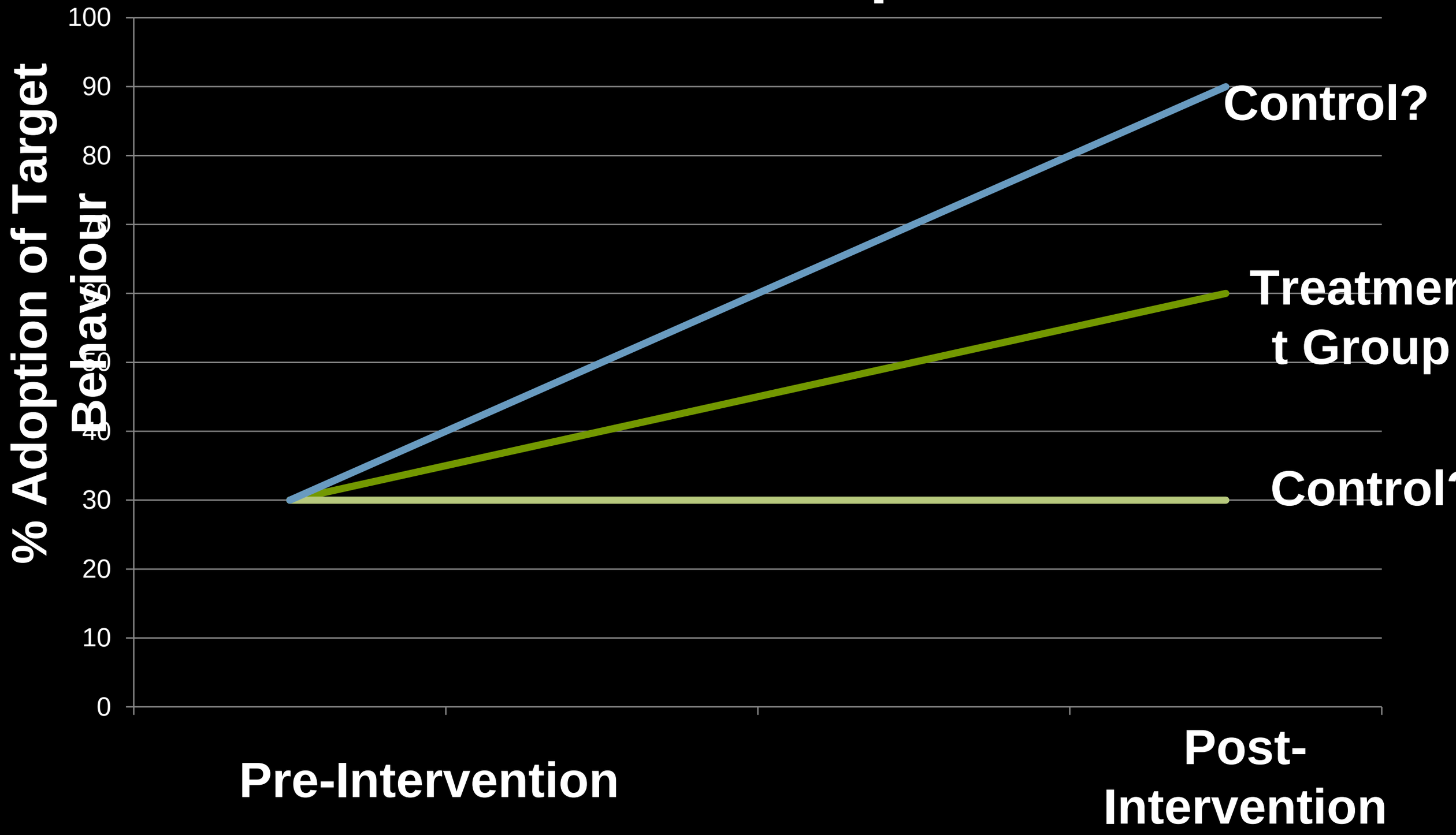
Is social science necessarily soft science?

- Ecological scientists generally evaluate their interventions by comparing one or more treatment groups to a control group.
- Strangely (and quite unfortunately) social researchers often employ less rigorous approaches to evaluate the effectiveness of their engagement initiatives.
  - # of flyers distributed
  - # of people attending meetings
  - Changes in adoption rates of best practice behaviours across time (no control)

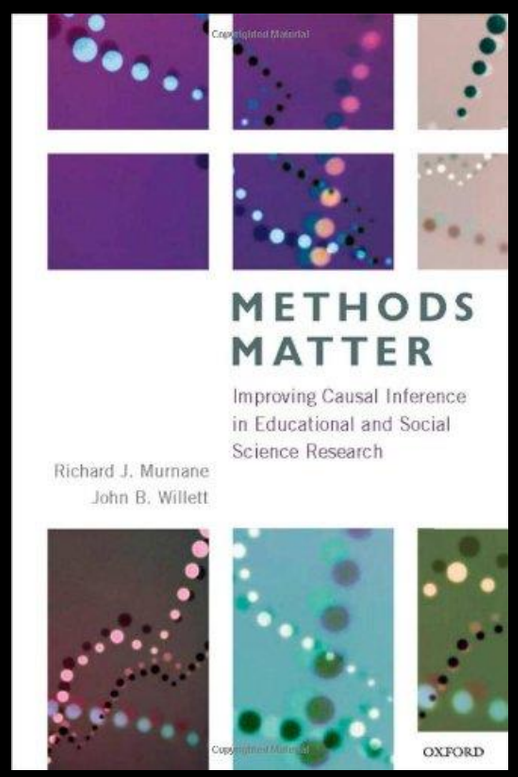
Pre-Test Post-Test Single Group Design



Importance of Control Group



Determining what works and why



- When attempting to discover which interventions are most effective, ***methods matter***!

- Control groups are essential, but randomized controlled trials (RCTs) are even better.

- RCTs represent the “gold standard” for determining whether an intervention is having a causal impact on behaviour.

Randomised Controlled Trials

- In the social sciences, people often reject RCT methodologies as impossible, impractical and unfeasible.
- People are often wrong!

MIT Poverty Action Lab: Randomnistas

- Mission to reduce poverty by ensuring that public policy is informed by scientific evidence.
- 791 ongoing and completed randomised evaluations in 72 countries, evaluating the effectiveness of:
  - Providing financial incentives for attending school
  - HIV education programs
  - Providing health insurance in high poverty areas

UNE Environmental Psychology Lab

- Have employed RCTs to evaluate the effectiveness:
  - Educational and technological strategies to reduce wood smoke pollution in Armidale.
  - Climate change messaging (e.g., message frames, narratives, messenger attributes).
  - Digital engagement strategies to encourage Australians to contain domestic cats (Lynette McLeod).
  - Landholder engagement strategies for improving the management of wild dogs (CISS)

Key takeaways

1. Use the strongest methodologies to evaluate your behaviour change interventions.

   - Always include a control group.

   - Use randomised controlled experiments whenever possible.

Attitude Change +
Awareness

≠ Behaviour Change

Behaviour Change
≠ Ecological or Economic
Benefits

Moving towards 2030

- Incorporating behaviour science principles into Australia's biosecurity strategy is NOT a silver bullet, cure all, or magic elixir.

- But with appropriate investment and attention to detail, it has the potential to substantially improve biosecurity outcomes.

Biosecurity Behaviour Change Clearinghouse

- A considerable amount of behaviour change research relevant to biosecurity has been conducted by universities, local and state governments, and other organisations.

- Much of this research is never written up, shared, and made easily accessible, which is a substantial barrier to learning and continuous improvement.

- A centralised clearinghouse and a commitment to ongoing comprehensive systematic reviews of the literature would enable us all to continue to learn together.

Embedded PhD Model
(Behaviour Works)

- Industry-funded PhD scholarships in which students are embedded in organisations for 3 years to design and implement behaviour change projects.

  - Cost-effective

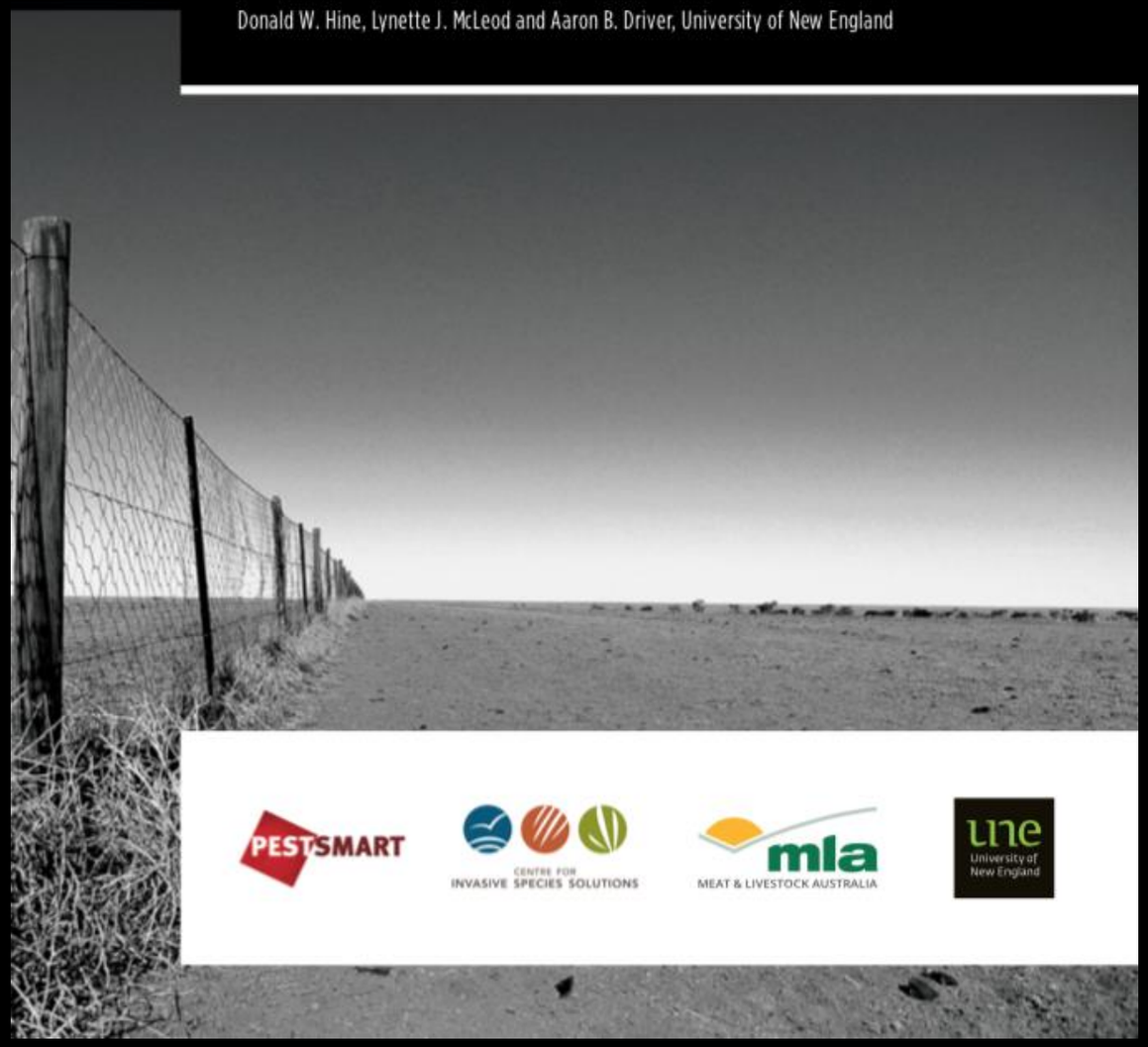
  - Reduces the likelihood the projects “fall over”

  - Facilitates bi-directional learning

  - Ensures a supply of well-trained specialists to continue to apply and refine behaviour change principles relevant to biosecurity.

Designing Behaviour Change Interventions for Invasive Animal Control: A Practical Guide

Donald W. Hine, Lynette J. McLeod and Aaron B. Driver, University of New England



Available for download from the pestsmart.org.au

https://www.publish.csiro.au/book/7809

Thank You

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