

Is biosecurity doing a good job in keeping invasive pests out?

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Catalyst for the project



In the face of multiple incursions, how healthy is the biosecurity system? How confident are we that it works?

Senate estimates question



Project objectives



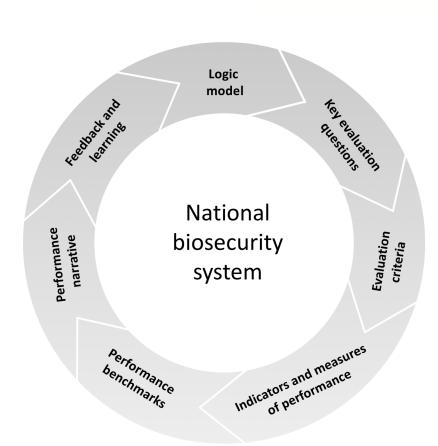
- Develop a rigorous performance evaluation *framework* that can be used repeatedly to evaluate the health of the biosecurity system at the *national* level against agreed *performance criteria* and using appropriate *performance indicators*
- Provide an objective basis on which to identify risk in the biosecurity system and to guide evidence-based investment decision making



Evaluation framework



- 1. Logic model as basis for evaluation
- 2. Key evaluation questions
- 3. Evaluation criteria
- 4. Performance indicators and measures
- 5. Performance benchmarks
- 6. Performance narrative
- 7. Inform future operations and evaluations





Logic model diagram



Goal: "The goal of a national biosecurity system is to minimise the impact of pests and diseases on Australia's economy, environment and the community, with resources targeted to manage risk effectively across the continuum, while facilitating trade and the movement of animals, plants, people, goods, vectors and vessels to, from and within Australia" (IGAB, 2012)

Context	Inputs	Activities	Outputs	Outcomes (What we want to achieve)					
(Current situation)	(What we invest)	(What we do)	(Quantity, Coverage)	Direct	System-level	External			
Global context Increasing global trade and travel Diversification of import pathways Intensification of agriculture	Participants Commonwealth Government State / Territory / Local Governments Industry / Primary producers	Environmental scanning forums Offshore surveillance Import risk analysis International arrangements Import condit. / permits Offshore audit / Capability bldg.	# Intormation sharing activities / forums ide ide in the intermediate ide ide ide ide ide ide ide ide ide id	the risk profile is entified, assessed and prioritised The number of riority pests and eases approaching	IGAB Objective 1: "Reduce the likelihood of exotic pests and diseases, which have the potential to cause significant harm to the economy, the environment, and the	Strong economy: A reduction in the impact of pests and diseases on the			
Urbanisation Climate change Australian context Premium agricultural	Community Research providers NGOs Financial resources	verification in neighbours Inspection / Clearance Diagnostics Treatment Quarantine	# BICON reviews # Passengers cleared # Items inspected # Items treated # Items surveys di	The number of riority pests and iseases entering stralia is reduced	community (including people, animals and plants), from entering, becoming established or spreading in Australia."	sustainability, productivity and competitiveness of Australian industry. Functioning ecosystems: A reduction in the			
industry Mega-diverse natural environment Strong economy, high standard of living Appropriate level of protection	Government expenditure Industry levies and fees In-kind contributions	Response agreements planning Simulation exercises Don-farm biosecurity Targeted surveillance surveillance	# Exercises conducted % Farms with 0-FBP % Priority pest/dis.: - contingency plan # Hectares surveyed # Surveillance network % Priority pest/dis.: - diagnostic tests - pr	articipants in the osecurity system ready to respond priority pests and isease incursions the time taken to tect incursions of riority pests and	IGAB Objective 2: "Prepare and allow for effective response to, and management of, exotic and emerging pests and diseases that	impact of pests and diseases on the health of the environment. Healthy people: A reduction in the incidence of mortality and morbidity arising from pests and diseases.			
IGAB Principles Shared responsibility Zero risk is unattainable	Inspection facilities Diagnostic laboratories Post-entry quarantine facility	Diagnostics Traceability Initial investigation Pest risk analysis Emergency Response Proof of freedom	- surveillance prog. # Initial investigations # Pest risk analyses # Response programs # Incursions delimited # incursions eradicat.	The number of riority pests and diseases that tablish and spread is reduced	enter, establish or spread in Australia"	Resilient communities: A reduction in the impact of pests and diseases on social assets and their amenity.			
Evidence-based resource allocation Risk creators and beneficiaries pay Internationally compliant	Human resources Capacity Capability	Relief & Recovery claims Domestic quarantine schemes Community led programs Relief & Area freedom claims Certification schemes Community led Regulation / Compliance	# Markets opened # Export certificates # ICA schemes # Community program	realised impact of ts and diseases on the environment, conomy and the imunity is reduced ruption to market cess is minimised	"Ensure that, where appropriate, significant pests and diseases already in Australia are contained, suppressed or otherwise managed"	uncingi			
Influencers and Enablers									
Partnerships	Governance Fund arrangements arrange	ing Resource Capabilit	y Info. mgmt. /	Research and Development	Communications and Engagement	Monitoring and Evaluation			





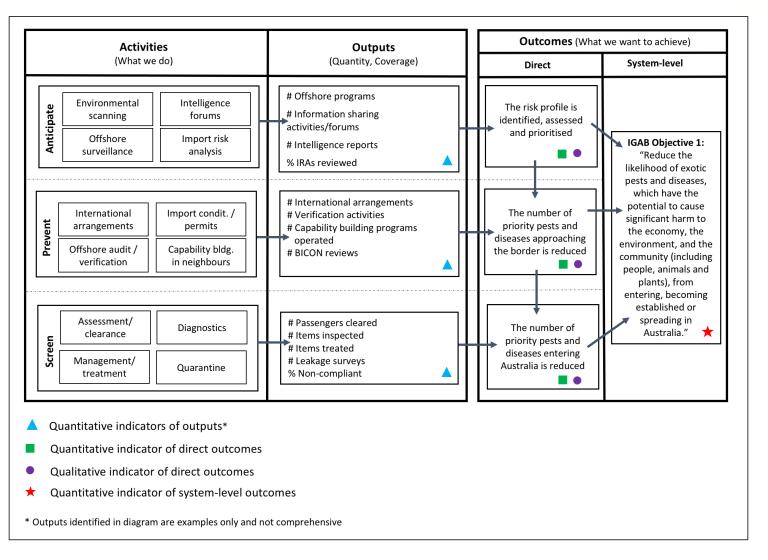
- Effectiveness
- Efficiency productive and allocative
- Resilience
- Capability
- Sustainability



Indicator framework - example



- Mix of quantitative and qualitative indicators
- Output indicators are important for scope and scale
- Outcome indicators are evaluative
- Use rubrics to summarise and order qualitative information





Screen: an indicator of direct outcomes



Leakage rate:

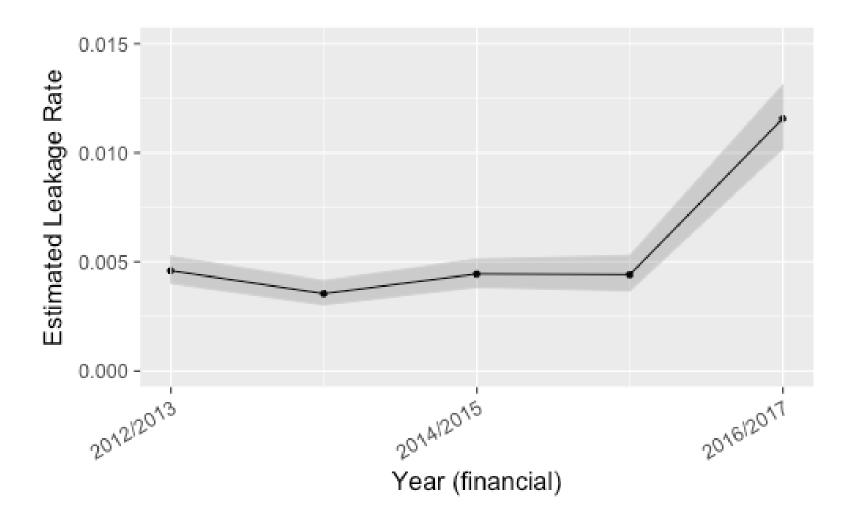
the amount or rate of biosecurity risk material that is not intercepted at the border

- observed through end-point surveys of mail, travelers and commercial containerised cargo
- modelling approach adopted to better estimate leakage
- can be measured at different levels of the biosecurity system



Example: estimated leakage rate for Brisbane Gateway Facility





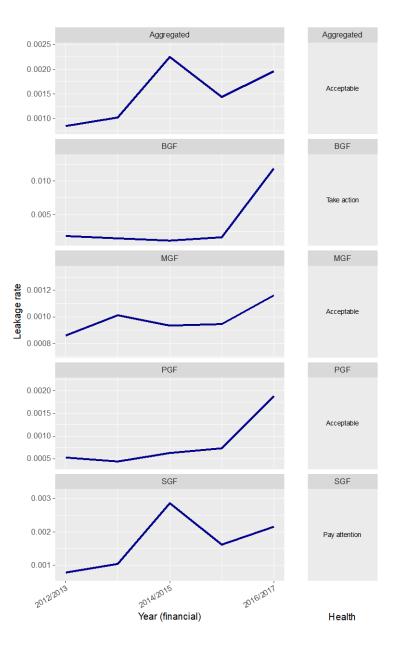


Performance benchmarks

Table 3.1.: Decision matrix to assign the health of the pathway based on monitoring the trend and level of the indicator. This decision matrix is for an indicator that should be *high*, so that being below the benchmark, or a decreasing trend is not desirable.

		Probability (p_b) that the indicator is less than the benchmark				
		$p_b > P_1$	$P_2 \le p_b < P_1$	$p_b < P_2$		
Dechability (a) that the in	$p_{i} > P_{1}$	Take Action	Pay Attention	Acceptable		
Probability (p_i) that the in- dicator is decreasing	$P_2 \le p_i < P_1$	Take Action	Pay Attention	Acceptable		
dicator is decleasing	$p_i < P_2$	Pay Attention	Acceptable	Acceptable		

Aggregated mail pathway – all mail types Inspected by canines





Using rubrics to synthesise qualitative information

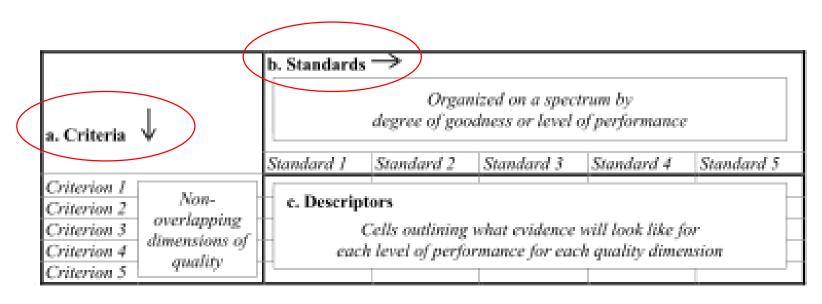


- Qualitative information can supplement and enrich quantitative evidence
- Important to consider views of stakeholders capture them rigorously and transparently
- Summarise and order qualitative information



Basic rubric structure





- Requires evaluative criteria and performance standards
- Rubrics can provide an evaluative description of performance at two or more defined levels
- Synthesis of results

Martens K. (2018): Rubrics in program evaluation. Evaluation journal of Australasia 18(1): 21-44



Implementing the evaluation framework



- Determining the appropriate level of aggregation for the performance evaluation
- Measuring qualitative information using rubrics
- Developing performance benchmarks, targets or expectations
- Resolving issues of data quality and availability





Thank you for your attention!