Australian Government
Department of Defence

NEXT GENERATION TECHNOLOGIES FUND

MACQUARIE University
SYDNEY·AUSTRALIA

A multi-systems approach to demand and resilience resource profiles within the at sea deployment setting

Modelling resilience reserve

"Clinical" threshold (10)

Adversity trend $(\hat{y}=a+\beta_{Adversity} + \beta^2_{Adversity})$ +95%CI

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Resilience-related outcome (e.g., PHQ-9)

Random variance region (Time 1)

$$\sqrt{(ABS(\Delta - Mean(PHQ9)^2 + ABS(\Delta - Mean(Adversity) * \left(\frac{\sigma PHQ9}{\sigma Adversity}\right))^2)}$$

Time related Adversity change (change in demands)
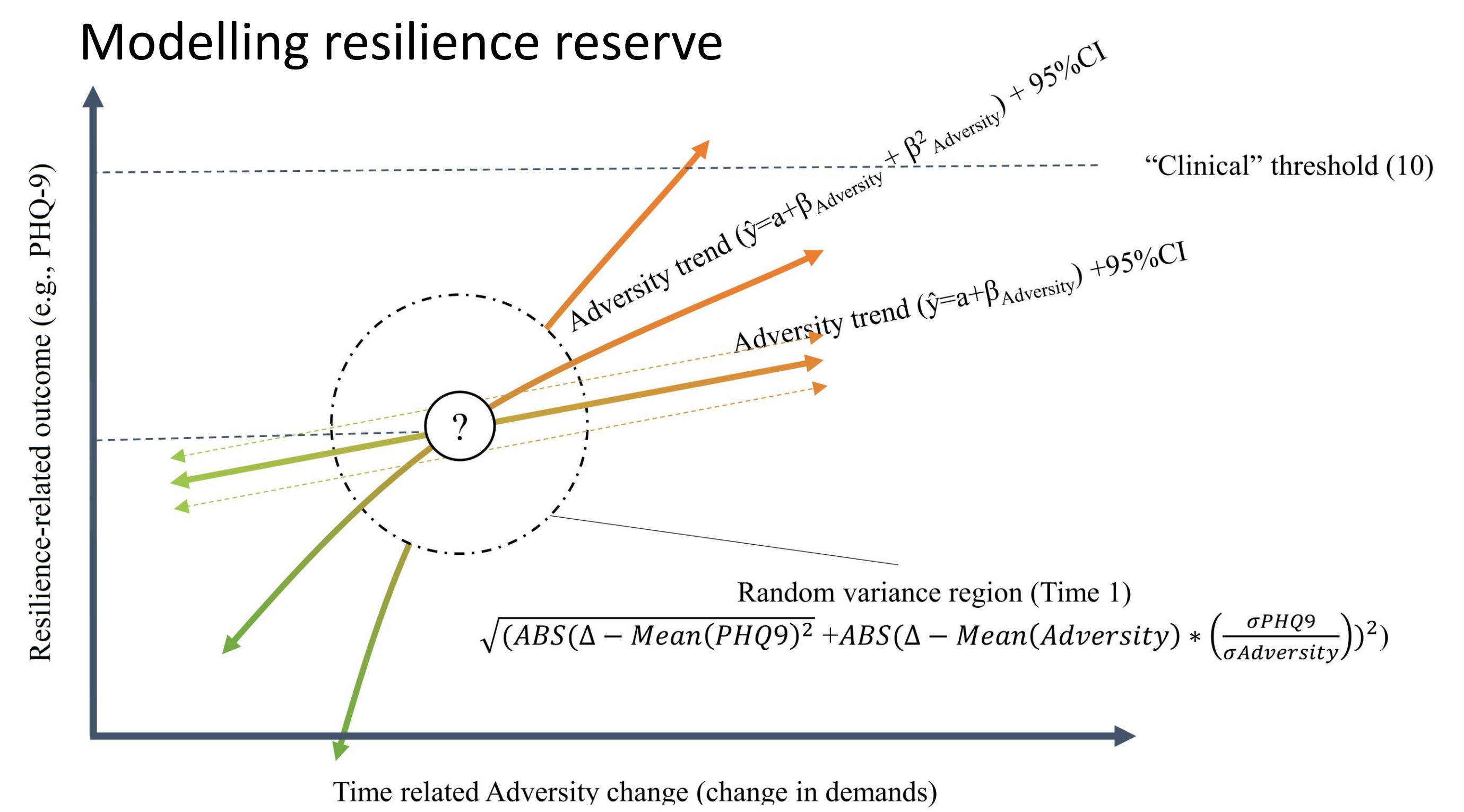
Purpose

- The outcomes of interest are human cognitive, performance and emotional resilience
- The project will examine the critical job-design, leadership and individual-level drivers that both promote and erode these outcomes in the Navy deployment context.
- Critical leverage points modifiable via policy, process and personnel training will be identified and a framework of intervention developed.

Product

- Specific recommendations that target leadership development
- Specific recommendations that target the job design features that are most impactful to the performance and cognitive decrements of personnel on sustained operations
- A tool for the surveillance of deployment-related risks to personnel cognitive, performance and emotional resilience outcomes
- A computational tool (resilience reserve tool) for projecting individual risk, before he/she experiences observable declines in functioning

Schedule

- FY19-20: Ethics approval, Complete Study 1, Study 2 pre-deployment data collection
- FY20/21: Delivery of meta-analysis report on key drivers of deployment-related outcomes. Delivery of tool for the surveillance of deployment-risks to Navy. Mid and post-deployment data collection
- FY21/22: Interim data collection. Finalize Study 2 data collection. Development of computational tool.
- FY22/23: Interim report focused on key leadership development targets. Final report detailing recommendations . Delivery of computation tool

Partners

- Macquarie University: Monique Crane, Ben Searle
- Curtin University: Daniel Gucciardi
- German Resilience Center: Raffael Kalisch and Thomas Rigotti.
- DST: Sam Huf and Natasha Hulse

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