



INSIGHTS SUMMARY

Nepean Blue Mountains region
2025



THE UNIVERSITY OF
SYDNEY
—
Brain and Mind
Centre

phn
NEPEAN
BLUE MOUNTAINS
An Australian Government Initiative

 **Wentworth
Healthcare**
Blue Mountains | Hawkesbury | Lithgow | Penrith

Right care, first time, where you live

About the Program

The Right Care, First Time, Where You Live initiative is a collaborative effort between the University of Sydney's Brain and Mind Centre, Wentworth Healthcare Primary Health Network (PHN), and the Nepean Blue Mountains community. It aims to transform youth mental health outcomes by using systems modelling to guide strategic planning and investment.

The program focuses on delivering the right care to young people-at the right time, in the right place-by identifying the most effective combinations of services and interventions tailored to the region's unique needs.



What is Systems Modelling?

To guide better investment decisions and outcomes for young people, we applied an evidence-based approach known as systems modelling. Systems modelling uses computer simulations to represent complex health and social systems. It allows stakeholders to test different strategies and forecast their long-term impact before implementing them in the real world. It is being applied to youth mental health to understand how various factors such as: social, economic and clinical, interact and influence outcomes.

Participatory Process

The model was developed through a participatory action research approach, involving three co-design workshops with local health providers, youth advocates, community leaders, and lived experience representatives.

📅 **Workshop 1 (April 2024):** Mapped the current youth mental health system and identified key programs for modelling.

📅 **Workshop 2 (August 2024):** Refined the model structure and validated intervention mechanisms.

📅 **Workshop 3 (November 2024):** Tested the model and explored policy insights. This inclusive process ensured the model **reflects local realities, community priorities, and lived experience.**



Why it matters

Bringing together decades of data and community insights, the digital tool turns complex system dynamics into clear, actionable forecasts.

This tool empowers PHNs, Local Health Districts (LHDs), and community leaders to make data-driven, **locally informed decisions**. It supports **strategic planning, resource allocation**, and **cross-sector collaboration**, helping to ensure lasting improvements in youth mental health across the Nepean Blue Mountains region.

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The Decision Support Tool

The result is a digital decision support tool that integrates:

- Local and national data (2011–2023)
- Forecast outcomes (2025–2035)
- Scenario testing (e.g., service expansion, disaster response)
- Community and clinical insights

It enables stakeholders to simulate interventions and assess their impact on youth mental health outcomes—such as emergency department presentations, psychological distress, and suicide rates.



Transformative Insights from Systems Modelling

A number of example analyses were presented, exploring the various scenarios under which investment decisions might be made to improve youth mental health outcomes in the Nepean Blue Mountains region. These example insights demonstrate the capability of the system dynamics decision support tool to generate robust, evidence-based projections of health outcomes. While not exhaustive, they showcase how the model can support strategic planning by identifying high-impact levers to drive meaningful change across the system. The results highlight that while individual interventions have value, it is the combination of expanded services, digital innovation, suicide prevention, Emergency Department (ED) diversion, and strengthened social cohesion that delivers the most significant improvements in outcomes for young people.



1. Expanding Service Capacity Drives Major Improvements

Doubling the growth rate of specialised and online mental health services leads to:

- **12%** reduction in mental health related ED presentations.
- **11%** decrease in mental health concerns.
- **3%** reduction in self-harm hospitalisations and psychological distress.

However, isolated service growth yields limited impact. A **holistic expansion** across the mental health system is essential to maximise benefits.



2. Digital Tools Enhance Reach and Efficiency

Technology-enabled integrated care, with 50% clinician uptake, results in:

- **6%** reduction in both ED presentations and 12-month mental disorders.
- When combined with service expansion, outcomes improve further:
 - **17%** reduction in ED presentations.
 - **17%** reduction in mental health concerns.

Clinician training and workflow integration are key to unlocking the full potential of digital platforms.



3. Suicide Prevention Programs Save Lives

Targeted interventions **Youth Post-Attempt Care** and **School-Based Suicide Prevention** deliver measurable impact:

- **23%** reduction in self-harm hospitalisations.
- **20%** decrease in suicide deaths.

High uptake (80–90%) is critical. Combining prevention and aftercare creates a comprehensive safety net for vulnerable youth.



4. Emergency Department Diversion Reduces Crisis Burden

PACER (Police, Ambulance, Clinical Early Response) and Safe Haven programs offer effective alternatives to EDs:

- **30%** reduction in ED presentations.
- **18%** decrease in mental health concerns.
- **6%** reduction in self-harm and suicide deaths.

These interventions are the most impactful for ED diversion and should be prioritised for regional rollout.



5. Social Cohesion is a Powerful Protective Factor

Improving social cohesion by 20% leads to:

- **39%** reduction in mental health concerns.
- **13%** decrease in psychological distress.
- **14%** reduction in suicide deaths.

When combined with other strategies, social cohesion amplifies outcomes e.g., **32% reduction** in self-harm and **16% reduction** in distress.



6. Disaster Resilience Through Community Connection

Disasters significantly worsen youth mental health:

- **18%** increase in mental disorders.
- **15%** rise in ED presentations.

Enhancing social cohesion during or before disasters mitigates these effects:

- Up to **37%** reduction in mental health concerns.
- **27%** decrease in ED presentations.
- **10%** drop in psychological distress.

Early investment in **community-building** is essential for long-term resilience.

Conclusion: A Holistic, Evidence-Based Path Forward

The modelling shows that no single intervention is enough. The greatest improvements come from integrated strategies that combine service expansion, digital innovation, suicide prevention, ED diversion, and social cohesion.

Economic Insights from Systems Modelling



A number of example analyses were presented exploring the various scenarios under which investment decisions might be made to improve youth mental health outcomes in the Nepean Blue Mountains region. These example economic insights demonstrate the capabilities of the system dynamics decision support tool to generate economic evidence but are far from an exhaustive catalogue of the types of economic analysis the model can perform. Sensitivity analysis, for example, can be carried out in the context of a more comprehensive 'business case' in the context of a real-life impending funding decision.

Three types of system change can be modelled, individually or in combination: (i) interventions, where a new or up-scaled service or program can be clearly defined and costed; (ii) mental health service capacity growth; and (iii) 'what if' scenarios, where a selection of social determinants can be increased or decreased. The type of economic analysis and conclusions that can be inferred differ depending on the type of system change.

Four example economic insights were reported.



1. Disaster Preparedness Through Economically Strategic Investment

Doubling a selection of mental health services capacity growth rates was compared to different natural disaster settings to explore how bolstering existing services in advance could mitigate the impacts of a natural disaster. The findings suggest that **strategic increases in service capacities**, in this scenario online mental health services and specialist mental health services, can act as a **sustainable disaster alleviation strategy**. By proactively scaling up these services, the negative health impacts of disasters on mental health outcomes may be mitigated. Future cost impacts of disaster-related mental disorder health burden can be alleviated by proactive investment in existing services.

2. Targeted Investment: Understanding What Works and Why



The cost effectiveness of three interventions was investigated to compare the trade-off between the cost of implementation, health benefits, and downstream cost consequences. The three interventions were selected to demonstrate different types of economic conclusions. The police and ambulance co-response team (PACER) was cost effective because it improved health and reduced costs. Technology-enabled integrated care was cost effective because, although it increased costs the health care sector, the health benefits were sufficiently great for it to be considered cost effective. School-based suicide prevention was not cost effective because the health benefits in terms of quality-adjusted life years were not sufficient to outweigh the relatively large intervention costs. There may be other circumstances in which school-based suicide prevention is considered cost effective, such as considering the cost per suicide death averted.

3. Unpacking Cost-Effectiveness: The PACER Deep Dive



A 'deep dive' was conducted into a single intervention, PACER, to demonstrate the variety of economic measures that can be used to analyse if and why it is cost effective. The intervention implementation costs were offset by cost reduction in health care expenditure and productivity improvements. This was driven predominantly by its effectiveness in reducing mental health related ED presentations. There was also a slight reduction in self-harm hospitalisations. A positive 'incremental net monetary benefit' was explained as another measure that demonstrates its cost effectiveness.

4. Smart Prevention: Investing in Social Determinants to Offset Disaster Impacts



Various scenarios of changes to social determinants of mental health and natural disasters were modelled to investigate the impact on quality-adjusted life years and costs. Improvements in the social determinants of mental health showed an improvement to health and cost savings/a reduction in costs in the health care and societal perspective. Improvements in these determinants of mental health showed they have potential capabilities to mitigate disaster-induced costs, demonstrating economic value in both the non-disaster and disaster scenarios.

The Bigger Picture: What the Economic Evidence Tells Us

The insights included in this brief, derived from systems modelling for youth mental health in the Nepean Blue Mountains region, demonstrates the value of using economic evidence to guide investment decisions by identifying the most cost-effective interventions. The balance between intervention costs, downstream cost consequences and health benefits in terms of Quality Adjusted Life Years (QALYs) provides a more complete picture of changes in quality of life and overall costs that moves beyond more intermediate measures like emergency department presentations and hospitalisations.

The cost-effectiveness analysis that can be conducted by using the model can aid in identifying those interventions that are likely to be cost effective and can be prioritised for implementation based on economic (and population health) grounds. There may be other reasons to implement interventions that are not cost effective. More detailed economic information is available from the research team.