Lumos

AUSTRALIAN FIRST

Estimating 5-year cardiovascular risk using Lumos

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in Australia. Risk equations are pivotal in guiding clinical decision-making, targeting preventive measures and optimising resource allocation for individuals at high risk of CVD. The current national risk equations (AusCVDRisk) are derived from New Zealand data and have not been validated using Australian data, limiting confidence in their application to local populations.

The Lumos program provides a secure, state-wide data linkage between general practice, hospital and mortality records, offering population-level coverage and longitudinal continuity of care data. This infrastructure allows for large-scale, representative analyses of real-world healthcare data, enabling development and validation of risk models that reflect actual clinical practice patterns and patient diversity across New South Wales.

Key Outcome:

Validated sex-specific 5-year cardiovascular disease risk tool

Compared to current tools:

Based on Australian data across the complete patient journey

Demonstrates improved classification of CVD risk

Using Lumos to estimate 5-year risk of cardiovascular disease

Kuo, Barbieri *et al.*[1] present a study using Lumos data to develop and validate sex-specific 5-year CVD risk equations.

The study used patient data extracted for **5.6 million unique patients** that had attended **680 general practices***. At the time, this comprised approximately 25% of NSW general practices.

Individuals aged 30–74 years on 1 January 2017 with no prior CVD history and at least one record for a clinical measurement or pathology test were included in the analysis.

Sex-specific Cox proportional hazards models were used to estimate 5-year risk of a fatal or non-fatal CVD event. Predictors included demographics, smoking, chronic conditions, clinical variables and medications.

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More information on Lumos is available at health.nsw.gov.au/lumos

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An Australian Government Initiative

What were the findings from this work?

This study developed and validated sex-specific 5-year CVD risk equations that performed consistently across demographic and geographic subgroups.

The new model demonstrated improved classification of CVD risk compared to the current AusCVDRisk equation. This means that more patients with a true CVD risk are correctly recognised as having higher risk, while patients with a low CVD risk are less likely to be flagged for unnecessary treatment or intervention.

Who could benefit from this work?

Health policymakers, primary-care networks, and digital-health developers seeking to strengthen cardiovascular prevention strategies through evidence-based, automated risk assessment embedded in Australian general practice.

Options are being explored to operationalise the new models within general practice software for automated, locally validated CVD risk estimation. For the first time, this would provide general practice with 5-year CVD risk estimates based on comprehensive Australian data.

Applications of this work:

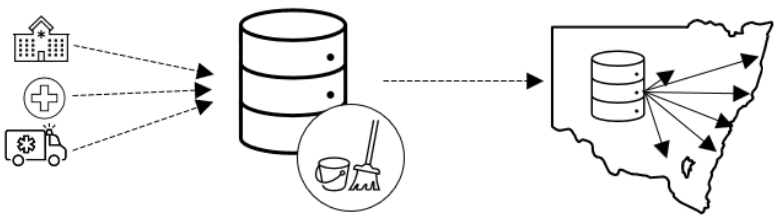
Inform and strengthen cardiovascular prevention strategies

Embed as an automated application in general practice to assist in identifying and managing patients at risk of CVD

More about Lumos and the study

Lumos is the largest collaboration between NSW general practices, NSW Health and NSW Primary Health Networks (PHNs) to date.

Lumos combines deidentified data from general practices, hospitals and other health services. For more information on the steps between data collection and release of data for analytics, see **Lumos Data Timelines Explained**.



Lumos **does not** currently include Aboriginal Medical Services and the Aboriginality of patients cannot be identified in the data. Lumos is working with Aboriginal leaders and communities to implement Indigenous Data Sovereignty and Governance to address this gap.

*By March 2026, Lumos had further grown to over **900 general practices** and **7 million unique patients**, increasing coverage and addressing data gaps. Lumos continues to expand.

1. Kuo NI-H, Barbieri S, Arnott C, *et al.* Estimating 5-year absolute risk of cardiovascular disease using routinely collected electronic medical records from Australian general practices. *Heart* Published Online First: 17 November 2025, doi:10.1136/heartjnl-2025-325776