Case Study

Pathway: Public health and health system-level intervention

From research to routine care: The Omega-3 Test-and-Treat Program for preterm birth prevention

BUILDING A HEALTHY AUSTRALIA

NHMRC

Translation

1986	2006	2018	2020	2021	2025	2026
Hypothesis developed	Intervention evidence synthesised	Scalable blood testing developed	Clinical effectiveness demonstrated; Evidence integrated into guidelines	Implementation program established	Feasibility and fidelity demonstrated	Economic case established; Free antenatal omega-3 testing available in South Australia

Stages

Discovery and early evidence (1, 2, 3) → **Evidence, targeting and policy development** (4, 5) → **Program development and implementation** (6, 7, 8) → **Transition to health system ownership** (9, 10, 11) → **Impact**

Pathway to impact

Discovery and early evidence

Comparisons between genetically similar populations showed longer gestations and higher birthweights in Faroese women than in mainland Danish women, attributed to higher marine omega-3 intake (1986). Early small randomised-controlled trials of omega-3 supplementation in women with high-risk pregnancies were inconclusive. The Australian DOMInO trial[1] and subsequent Cochrane review[2] led by Professor Maria Makrides resolved this, demonstrating that omega-3 supplementation reduces preterm birth, with the greatest benefit for early preterm birth (<34 weeks' gestation) in women of unknown risk. In parallel, Professor Robert Gibson developed dried blood spot methods to measure omega-3 status and enable easy population-level testing.

Evidence, targeting and policy development

Building on this evidence, Professor Makrides led the largest trial of omega-3 supplementation in pregnancy, designed to test whether universal supplementation was effective at population scale.[3] It showed that benefit depended on a woman's omega-3 status early in pregnancy: those with low status were at increased risk for early preterm birth and omega-3 supplementation substantially reduced this risk, while those with sufficient levels were already at low risk and no benefit was gained.[4] This established omega-3 status as a clinically meaningful biomarker and shifted the approach from universal supplementation to targeted prevention. Targeted supplementation was adopted in the NHMRC Pregnancy Care Guideline as the first such international recommendation and subsequently included in other international guidelines.

Program development and implementation

Translating this evidence into routine care required a workflow-aligned delivery model and formal cross-system partnerships. The Omega-3 Test-and-Treat Program was co-designed with clinicians, consumers and pathology providers to identify and treat women most likely to benefit. A Memorandum of Understanding with SA Pathology committed to ongoing service delivery pending successful implementation. The laboratory test was adapted and validated to integrate with existing antenatal screening workflows. Partnership with GPEx supported training of frontline providers of antenatal care in SA. An equity focus was embedded throughout implementation, including targeted supplement provision for women with low omega-3 status in areas of disadvantage and delivery through Aboriginal Health Services. Implementation and evaluation, led by Dr Karen Best, demonstrated the program could be reliably delivered at scale, with demonstrated feasibility, fidelity and uptake.[5]

Transition to health system ownership

With feasibility, fidelity and scalability established, attention turned to building the economic case for sustained delivery in SA. National cost-effectiveness analyses showed that routine omega-3 testing and targeted supplementation would prevent around 640 early preterm births annually delivering significant cost savings to the health system, returning $3 for every dollar invested.[6] These findings underpinned a formal business case for ongoing delivery through the state's publicly funded pathology service. Barriers to sustainable, equitable and reliable delivery once research support ceases were identified and addressed through a forum and transition committee chaired by Health Translation SA, an NHMRC Accredited Research Translation Centre.

Impact

Every pregnant woman in South Australia is now offered routine omega-3 testing in early pregnancy, with targeted advice regarding supplementation. Current uptake is around 50%, with over 40,000 women tested to date. Up to 76 early preterm births per year are projected to be prevented in South Australia by targeting supplementation to the one in six women with low omega-3. Early preterm birth prevention matters because babies born this early face the highest risks of death, lifelong disability and chronic disease, with major impacts on families, the health system, and society.

Scale-up to other Australian jurisdictions is now underway.

The Omega-3 Test-and-Treat Program model is also being adopted in parts of Europe and North America.

Stakeholders

- Industry
- Policymakers
- Clinician-researchers
- Funders
- Tertiary institute
- Research organisations
- Consumers and community
- Health services

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Pathway to impact

1. Hypothesis generated from population observations.
2. Evidence synthesised to evaluate intervention efficacy.
3. Testing approach developed for population-scale use.
4. Clinical effectiveness and variation in response evaluated through trials and evidence synthesis.
5. Target population defined to guide intervention and policy.
6. Targeted intervention translated into a scalable service delivery model.
7. Cross-system partnerships established to support implementation and delivery.
8. Processes integrated into existing workflows.
9. Cost-effectiveness modelled to support ongoing service delivery and national scale-up.
10. Remaining system barriers identified and addressed.
11. Operational responsibility transferred with governance established for ongoing delivery.

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1 Makrides M et al. (2010). Effect of DHA supplementation during pregnancy on maternal depression and neurodevelopment of young children: a randomised controlled trial. JAMA. 304: 1675–1683. doi.org/10.1001/jama.2010.1507
2 Middleton P et al. (2018). Omega-3 fatty acid addition during pregnancy. Cochrane Database Syst Rev. 11: CD003402. doi.org/10.1002/14651858.CD003402.pub3
3 Makrides M et al. (2019). Randomised trial of prenatal n-3 fatty acid supplementation and preterm delivery. N Engl J Med. 381: 1035–1045. doi.org/10.1056/NEJMoa1816832
4 Simmonds LA et al. (2020). Omega-3 fatty acid supplementation in pregnancy: baseline omega-3 status and early preterm birth – exploratory analysis of a randomised controlled trial. BJOG. 127: 975–981. doi.org/10.1111/1471-0528.16168
5 Best KP et al. (2025). The early implementation phase of the omega-3 test-and-treat program for reducing the risk of preterm birth, South Australia, 2021–22: an implementation evaluation study. Med J Aust. 223: 626–633. doi.org/10.5694/mja2.70101
6 Haji Ali Afzali H et al. (2026). Model-based cost-effectiveness analysis of routine omega-3 testing and targeted supplementation to reduce early preterm birth in Australia compared with current practice. Clinicoecon Outcomes Res. 18: 585692. doi.org/10.2147/CEOR.S585692