

Value in maternal health - costs, and physical and mental health outcomes for the benefit of women, families and infants

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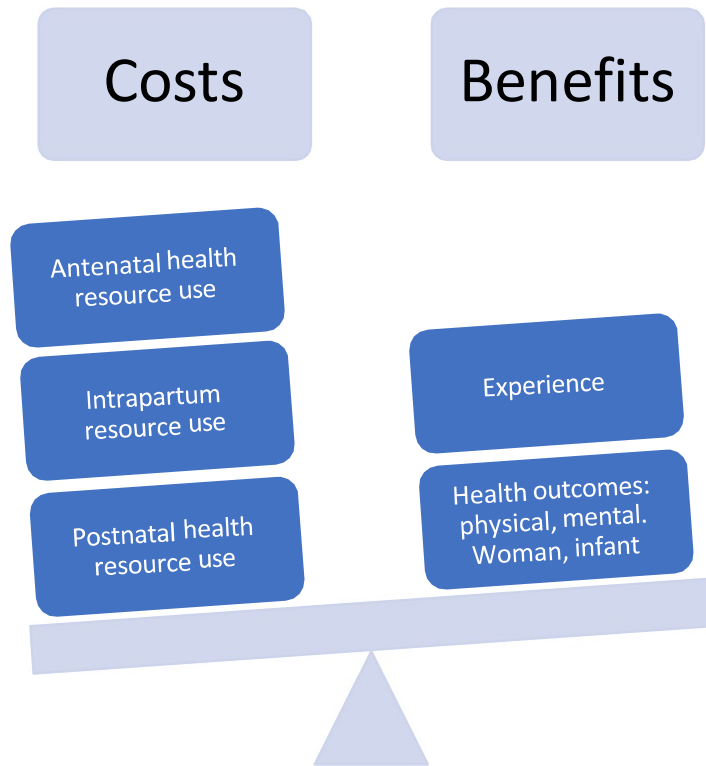
Overview

1. Background: Maternal health economics
2. Current value in maternal health care
3. Cost effective options to improve value
4. The future: Driving system wide transformation through a Maternity LHS

Background: Maternal health economics



What is value?



Value refers to the benefit derived relative to cost

High value = high level of benefit at a given cost

Low value = low level (or no) benefit at a given cost

COMMENTARY

BIRTH ISSUES INTERGATE CARE WILEY

Value in maternal care: Using the Learning Health System to facilitate action

Emily J. Callander PhD^{1,2} | Helena Teede PhD² | Joanne Enticott PhD²

Importance of value for maternal health – costs, outcomes

The 10 most common reasons and costs for admission in all hospitals for women and babies from pregnancy to 12-month post-birth—all births in Queensland, Australia, 2017/18.

Rank	AR-DRG description				
	Women: during pregnancy	Women: at giving birth	Women: 12-month post-birth	Babies: at birth	Babies: 12-month post-birth
1 st	Antenatal and Other Obstetric Admission	Vaginal Delivery	Other Factors Influencing Health Status	Neonate, AdmWt >2499 g W/O Significant OR Procedure W/O Problem	Whooping Cough and Acute Bronchiolitis W/O CC
2 nd	False Labour	Antenatal and Other Obstetric Admission	Antenatal and Other Obstetric Admission	Neonate, AdmWt >2499 g W/O Significant OR Procedure W Other Problem	Otitis Media and URI
3 rd	Abdominal Pain or Mesenteric Adenitis	Caesarean Delivery W Severe CC	Postpartum and Post Abortion W/O OR Procedures	Neonate, AdmWt >2499 g W/O Significant OR Procedure W Major Problem	Oesophagitis and Gastroenteritis W/O Cat/Sev CC
4 th	Other Uterine and Adnexa Procedures for Non-Malignancy	Caesarean Delivery W Catastrophic CC	Mental Health Treatment, Sameday, W/O ECT	Neonate, AdmWt 2000-2499 g W/O Significant OR Procedure W Other Problem	Viral Illness
5 th	Other Female Reproductive System OR Procedures	False Labour	Other Factors Influencing Health Status, Sameday	Neonate, AdmWt 2000-2499 g W/O Significant OR Procedure W/O Problem	Signs and Symptoms

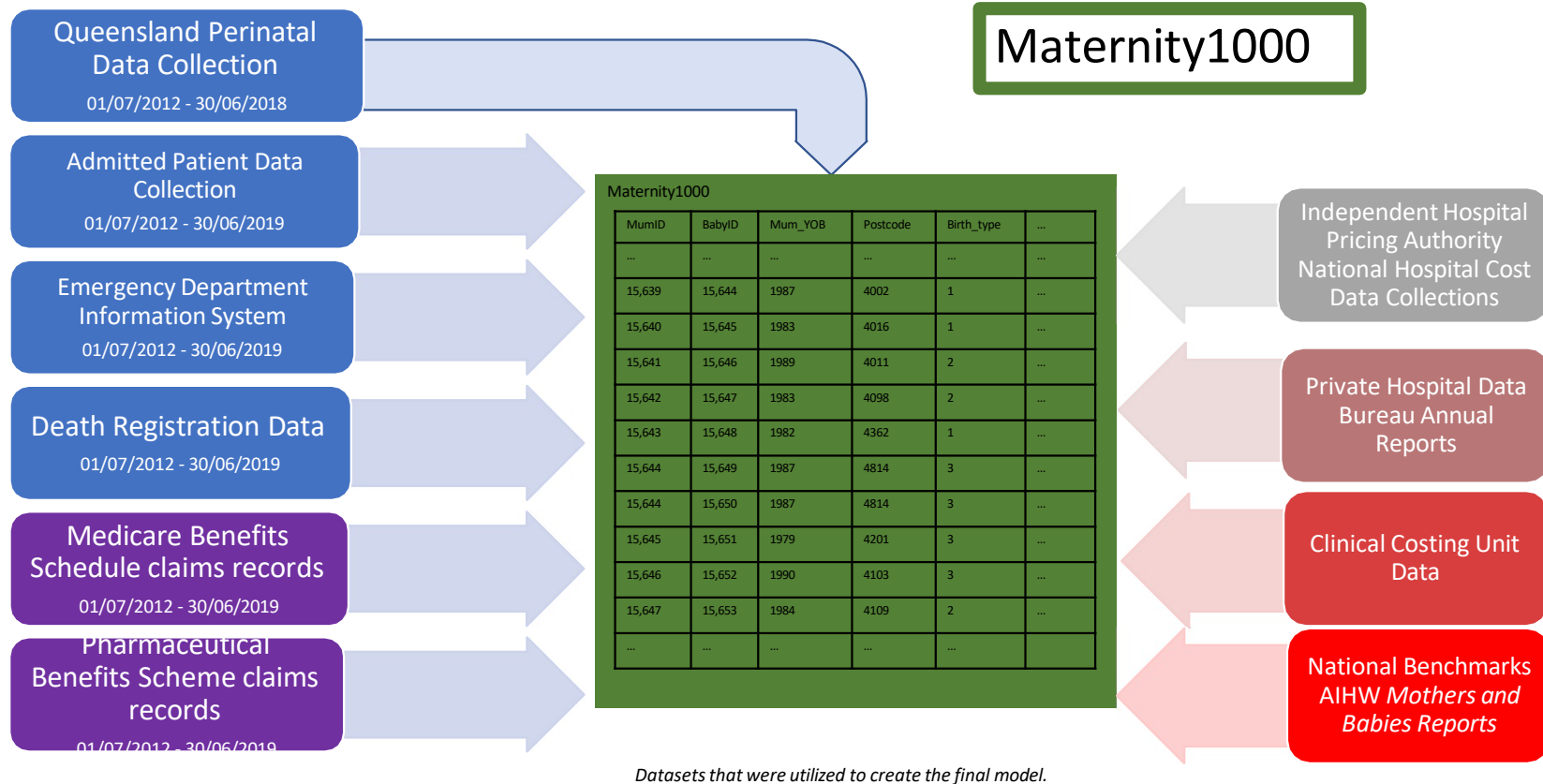
ORIGINAL ARTICLE

WILEY

Unlocking big data to understand health services usage and government funding during pregnancy and early childhood, evidence in Australia

Yanan Hu BCom¹ | Xin Zhang MEng² | Emily Callander PhD¹

Data as an asset for measuring value



- Identifying women on whole maternity journey (not just single episodes)
- Identifying all health service use (in and out of hospital)
- Identifying longer term outcomes (MH)

Current value in maternal health care



Variations in costs to funders – all public Queensland births, 2012 - 2015

Birth HHS	N	Adjusted Mean Cost per birth*
1-HHS	811	\$10,907
2- HHS	9,412	\$11,307
3- HHS	6,358	\$11,467
4- HHS	8,677	\$11,643
5- HHS	4,947	\$11,780
6- HHS	9,247	\$11,956
7- HHS	7,162	\$12,005
8- HHS	8,453	\$12,256
9- HHS [#]	13,075	\$13,765
10- HHS	16,457	\$13,894
11- HHS	1,573	\$14,922
12- HHS [#]	8,366	\$16,445
13- HHS [#]	24,138	\$16,711
14-HHS	409	\$18,340
15	17,687	\$18,505
16- HHS	294	\$22,910

Australian Health Review, 2019, 43, 556–564
<https://doi.org/10.1071/AH18209>

Cost of maternity care to public hospitals: a first 1000-days perspective from Queensland

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*Debra K. Creedy*² PhD, Professor of Perinatal Mental Health

*Jenny Gamble*² PhD, Professor of Midwifery

*Haylee Fox*¹ MPH, Research Officer

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Adjusted means – accounting for mother's age, BMI, vertex presentation, first pregnancy, gestation (weeks) at birth, baby's birthweight, pre-existing health conditions, complications that developed in pregnancy, Indigenous identification, smoking after 20 weeks, socioeconomic status and rurality of the woman's usual place of residence at the time of birth.

CHANGES IN COST

Trends in mean costs per birth to different funders, Queensland, Australia, 2012 – 2018

INCLUDED COSTS:

- Inpatient
- Outpatient
- Emergency department
- All MBS-funded services
- PBS-funded prescriptions

Onset of pregnancy > discharge post-birth

Source: Callander E, Enticott J, Eklom B, Gamble J, Teede H. (2023) The value of maternity care in Queensland, 2012-18, *MJA*, 219 (11): 535-541

Considering changes in benefit

Maternal and infant outcomes as a percentage of all births Queensland, Australia, 2012 – 2018

	2012	2013	2014	2015	2016	2017	2018	Change
	%	%	%	%	%	%	%	%
Infant death***	0.9	0.9	0.8	0.8	0.7	0.8	0.7	-20%
Admission to SCN or NICU***	18.1	17.8	17.4	17.4	18.2	19.1	19.0	5%
APGAR<7***	2.2	2.3	2.5	2.5	2.5	2.5	2.4	7%
Neonate - HIE*	0.03	0.02	0.02	0.04	0.0	0.1	0.03	0%
Neonate - Birth Trauma***	0.8	0.7	0.8	0.9	1.1	1.3	1.4	75%
Neonate - Hypoxia***	0.2	0.2	0.2	0.2	0.2	0.1	0.2	-23%
Neonate - Other morbidities	6.7	7	6.9	6.3	6.6	6.7	7.1	5%
Perineum damage	1.6	1.6	1.8	1.7	1.7	1.6	1.4	-8%
Maternal haemorrhage***	6.8	7.0	7.6	8.4	9.3	9.9	10.9	61%
Rupture of uterus	0.03	0.03	0.03	0.03	0.03	0.0	0.1	67%
Retained placenta***	0.5	0.5	0.5	0.5	0.4	0.4	0.3	-33%
Composite***	27.1	27.0	27.2	27.7	29.1	30.2	30.5	13%

***significant at the <0.0001 level.

Changes in value

Cost per positive birth outcome produced, Queensland, Australia, 2012 – 2018

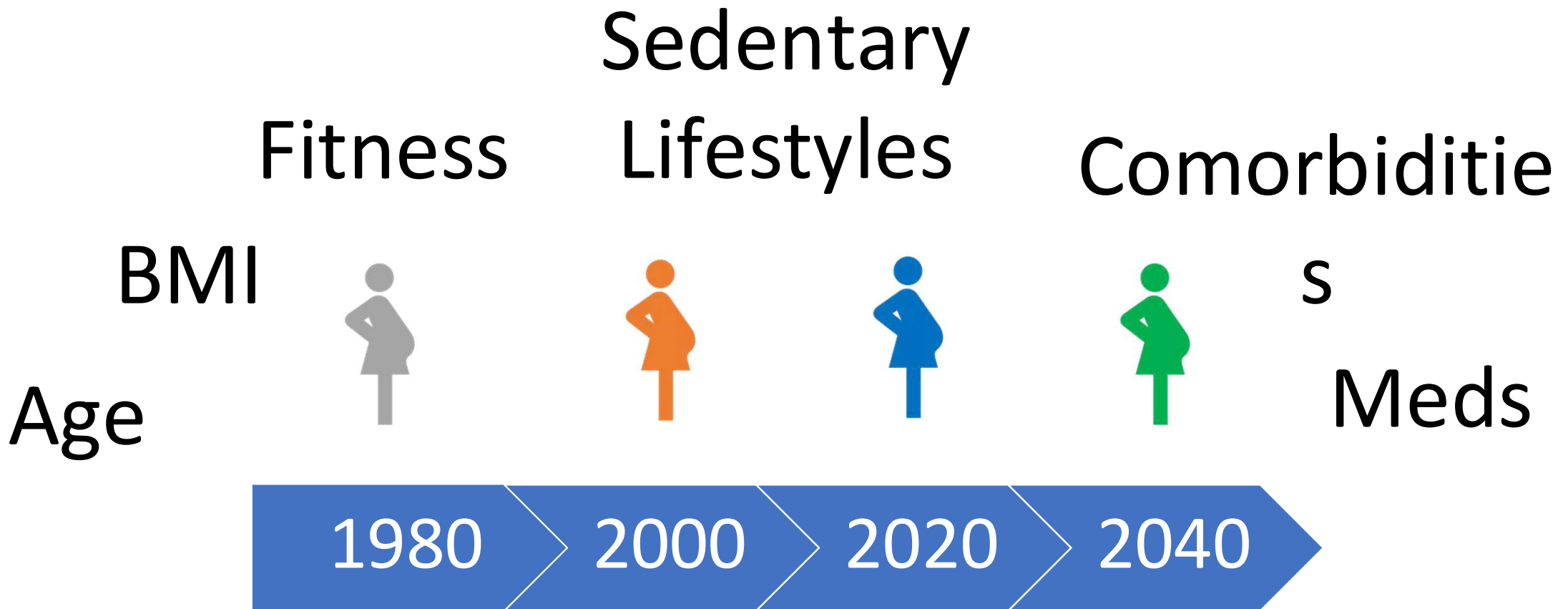
	2012	2013	2014	2015	2016	2017	2018
Sum of Costs for all births (A)	\$584,828,693	\$1,296,637,147	\$1,459,043,395	\$1,455,885,550	\$1,484,571,406	\$1,556,773,682	\$829,506,430
Number of Positive outcomes (B)	22,586	45,544	45,140	43,930	43,169	40,774	20,564
Cost per positive outcome (A/B)	\$25,893	\$28,470	\$32,323	\$33,141	\$34,390	\$38,181	\$40,338

Need to actively consider how to improve value

Drivers of change

Model of variation in total costs explained by confounding factors, Queensland, Australia, 2012 – 2018

Independent variables	Model			
	Point estimate	95% CI		% of variation
	-2696376	-2755512	-2637239	
Birth Year	1348.664	1319.313	1378.015	29%
Mother's age group				1%
Group 1	1909.993	1591.588	2228.398	
Group 3	308.8816	181.1781	436.5852	
BMI group				8%
Group 1	2975.638	2764.563	3186.713	
Group 3	763.0883	631.4199	894.7566	
Group 4	1945.954	1803.42	2088.488	
Indigenous	5113.936	4888.378	5339.493	7%
First Pregnancy	428.022	310.7952	545.2487	1%
Diabetes	2138.079	1959.393	2316.764	2%
Hypertension	3469.894	3159.136	3780.652	1%
Pre-eclampsia	10715.91	10357.87	11073.95	17%
Iatrogenic onset, 34 - 37 weeks	11586.25	11290.64	11881.85	20%
Elective CS, >37 weeks	-1161.21	-1441.6	-880.817	6%
Emergency CS, fetal distress, >37 weeks	5308.665	5016.647	5600.684	4%
CS, other reasons, >37 weeks	3616.178	3355.315	3877.042	3%
Induction of labour, >37 weeks	-1706.51	-1836.6	-1576.42	1%



Low risk women – healthy BMI range, singleton pregnancies, no co-morbidities: 10 percentage point decline (71% to 61%) in 6 years between 2012 and 2018

The National Health Reform Agreement

In August 2011 Council of Australian Governments (COAG) agreed to the National Health Reform Agreement [PDF 1.39MB | DOCX 195KB], which sets out the shared intention of the Commonwealth and state and territory (state) governments to work in partnership to improve health outcomes for all Australians and ensure the sustainability of the Australian health system.

From 1 July 2012 the National Healthcare Specific Purpose Payment was replaced by National Health Reform funding.

From 1 July 2017 Schedule I - Addendum to the National Health Reform Agreement [PDF 1.81MB | DOCX 88KB], implements the arrangements outlined in the Heads of Agreement as agreed by COAG in April 2016.

From 1 July 2020 Schedule I - Addendum to the National Health Reform Agreement [PDF 1.81MB | DOCX 88KB], implements the arrangements outlined in the Heads of Agreement as agreed by COAG in April 2016.

and transfer of funds to the States and Territories for the purpose of providing health services to the people of Australia.

A5 Growth in the Commonwealth's total annual funding contribution to health services nationally under this Addendum as outlined at clauses A6 and A7 will not exceed **6.5** per cent a year (the national funding cap). Details on the operation of the national funding cap are outlined in clauses A56 to A58.

Special Commission of Inquiry into healthcare funding

On 24 August 2023, the NSW Government announced the creation of a new Special Commission of Inquiry tasked with conducting a review of healthcare funding.

The Inquiry will also be tasked with identifying ways to deliver higher quality, more timely and patient-centred care.

As part of the comprehensive review, the Inquiry will examine:

- the existing governance and accountability structure of NSW Health
- the way NSW Health funds health services delivered in public hospitals and community settings
- strategies available to address escalating costs, limit wastage and identify areas of improvement in financial management.


Need to implement high-value care

- Lowering costs while maintaining health outcomes
- Improving health outcomes at same level of costs
- **Lowering costs AND improving outcomes**

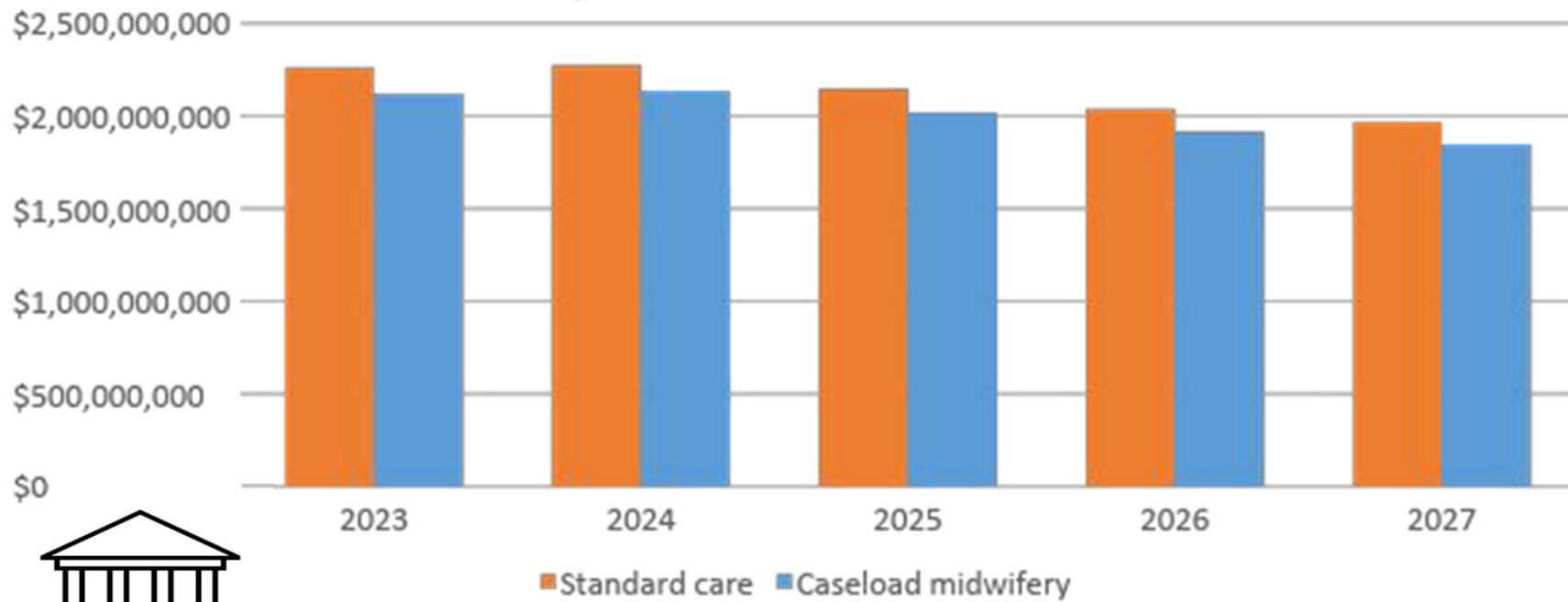
Cost effective options to improve value



Continuity of midwifery care – Economic Evaluation alongside RCT

	Caseload	Standard care	p-value	Difference
	Mean (SD)	Mean (SD)		
Antenatal health service use				
Outpatient episodes - Midwife	\$1,380 (\$143)	\$1,260 (\$348)	<.001	\$119
Outpatient episodes - Obstetrician	\$597 (\$126)	\$583 (\$119)	0.01	\$13
Outpatient episodes - General Practitioner	n/a – no shared care	\$47 (\$128)	n/a	-\$47
Emergency department episodes	\$408 (\$551)	\$426 (\$584)	0.62	-\$17
Labour, birth, postnatal in-hospital service use				
Induction of labour	\$1,676 (\$2,522)	\$1,835 (\$2,583)	0.36	-\$159
Labour and birth inpatient episodes- mother	\$7,885 (\$2,516)	\$8,234 (\$2,753)	<.001	-\$349
Neonatal inpatient episode - baby	\$4,920 (\$6,368)	\$5,193 (\$10,650)	0.02	-\$273
Postnatal inpatient episode, prior to discharge	\$3,041 (\$2,509)	\$3,707 (\$2,281)	0.01	-\$666
Postnatal outpatient episode (home visits)	\$424 (\$181)	\$348 (\$143)	<.001	\$76
Total costs for all services	\$20,330 (\$8,312)	\$21,637 (\$11,818)	<.001	-\$1,307

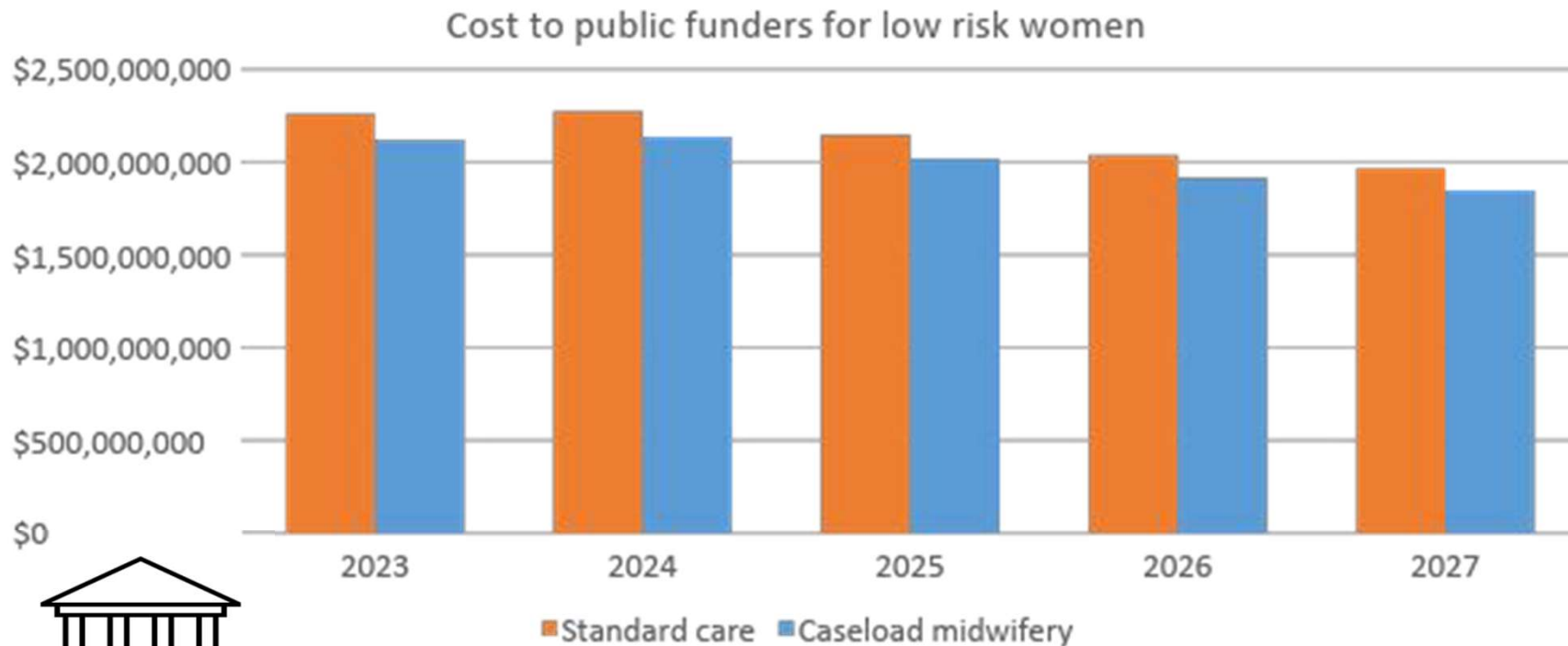
Cost to public funders for low risk women



Cost savings

-\$136,341,875	-\$137,255,036	-\$129,651,668	-\$123,202,721	-\$118,723,371	-\$645,174,671
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Modelled Budget Impact Analysis – Australian population of low risk women, 70% uptake and 90% adherence



Cost savings

-\$136,341,875	-\$137,255,036	-\$129,651,668	-\$123,202,721	-\$118,723,371	-\$645,174,671
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Real world data economic evaluation of continuity of midwifery care, Gold Coast Uni Hospital

Costs	Continuity of midwifery care Mean (SD) (\$AUS)	All other models Mean (SD) (\$AUS)
Mother's health service use		
Public hospital - inpatient	\$10,170.44 (6,972.79)	\$15,108.47 (19,311.31)
Public hospital – emergency department	\$594.85 (1,007.03)	\$941.19 (1,960.55)
Public hospital - outpatient	\$5,267.35 (2,362.74)	\$4,813.78 (3,595.53)
Medicare	\$589.07 (415.29)	\$702.05 (494.29)
Patient out of pocket	\$37.27 (121.40)	\$66.92 (157.28)
Baby's health service use		
Public hospital - inpatient	\$5,475.84 (2,766.93)	\$6,805.51 (6,430.60)
Public hospital – emergency department	\$896.00 (1,279.45)	\$1,018.24 (1,895.02)
Public hospital - outpatient	\$3,964.22 (2,425.73)	\$3,383.01 (2,983.12)
Medicare	\$589.07 (415.29)	\$702.05494.29)
Patient out of pocket	\$37.27 (121.40)	\$66.92 (157.28)
TOTAL costs	\$27,618.38 (11,396.79)	\$33,608.13 (29,172.04)

Purpose:

- To provide evidence to Chief Financial Officer at Gold Coast Health that their continuity of midwifery care program was generating cost-savings before approving a scale-up

Original Research Article

Cost-effectiveness of public caseload midwifery compared to standard care in an Australian setting: a pragmatic analysis to inform service delivery

EMILY J. CALLANDER^{1,2}, VALERIE SLAVIN^{1,3,4}, JENNY GAMBLE^{1,3},
DEBRA K. CREEDY^{1,3}, and HAZEL BRITTAIN^{1,3,4}

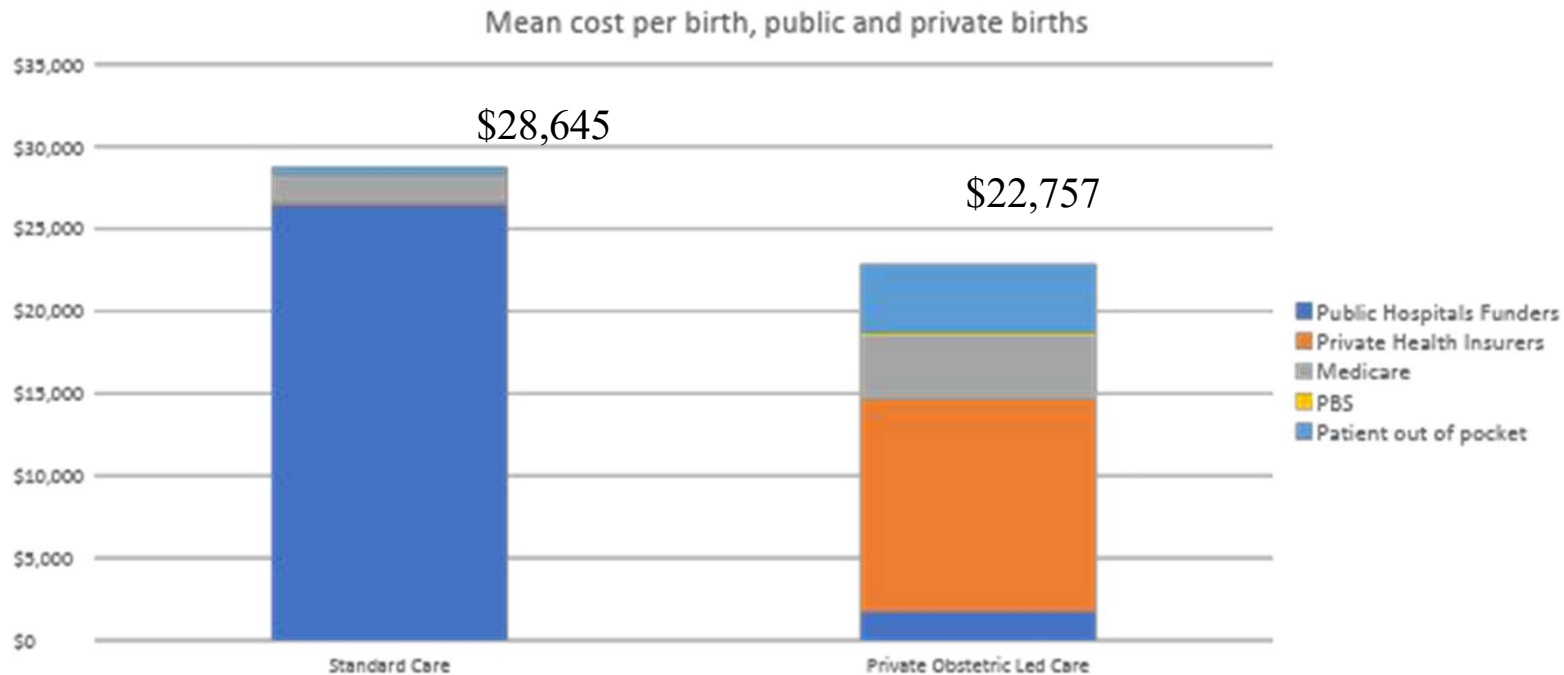
Design:

- Convenience sample of 300 women (150 continuity of midwifery care/150 standard low risk care)
- Propensity score matching used to control for differences due to lack of randomisation
- Administrative data used to capture costs incurred to Gold Coast Health (with others reported separately)
- **Quality of life measured at 3 time-points using short 9-item survey**
- >90% retention rate(!)

Real world data economic evaluation of private obstetric-led care compared to public standard care

Clinical Outcomes	Matched Results				
	Standard public maternity care (n=188,493)		Private obstetric-led care (n=188,493)		Excess in standard public maternity care
	N	%	N	%	
Stillbirth or neonatal death	1584	0.9%	806	0.4%	778
Neonatal Intensive Care Admission^	3584	3.5%	1283	1.3%	2301
APGAR Score <7 at 5mins	5448	3.0%	2701	1.5%	2747
Hypoxia	560	0.3%	110	0.1%	450
Perineal damage (3 rd /4 th degree tears)	4557	2.5%	1284	0.7%	3273
Maternal haemorrhage	17594	9.6%	6967	3.8%	10627
Total cost, ALL funders, mean (SD)	\$28,645 (21,466)		\$22,757 (12,461)		\$5,888

Real world data economic evaluation of private obstetric-led care compared to public standard care



Decline in private births

Driving system wide transformation through a Maternity LHS

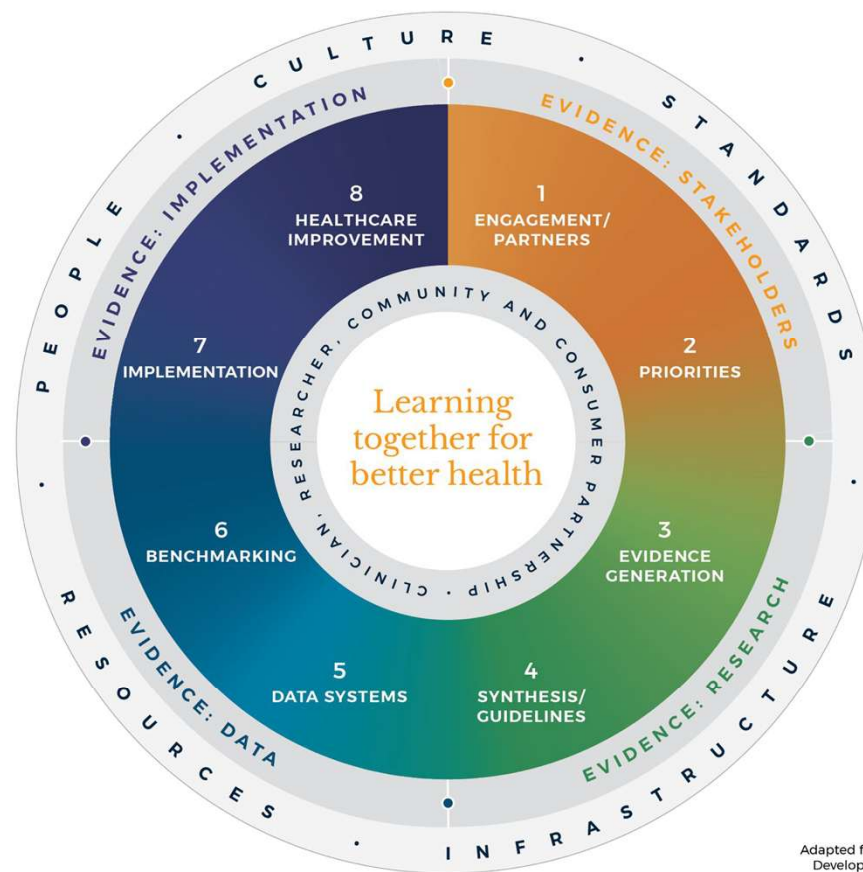


Where to?

- Need to consider value AND move towards creating better value;
- Bringing academic research and practice closer, ensuring research address service delivery realities
- The national Maternity Learning Health System to facilitate this



National Maternity Learning Health System



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Adapted from MCHRI framework
Developed by Monash Partners

Summary

- Demonstrated decline in value in maternal health care;
- Demonstrated variations in cost-effectiveness based upon differences in models of care;
- Need to expand work and move away from discrete projects, to embedding health economics routinely into research and practice;
- Can be achieved at scale through national Maternity LHS.