

**Maternal and perinatal research conducted in Australia:
Generation, synthesis, translation, implementation and impact**

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CONTENTS

Abbreviations.....	7
Declaration	9
Acknowledgments	11
List of key publications authored/co-authored by Philippa Middleton	12
CHAPTER 1 Introduction and outline of thesis.....	13
1.1 Introduction and review of the literature on research impact	13
1.2 Measuring the impact of research.....	14
1.3 Translational science and the research cycle	15
Fig 1.1: Pipeline (linear) model (Slote Morris 2011).....	16
Fig 1.2: Research/translation cycle (informed by Henderson-Smart 2003 & Graham 2006).....	17
1.4 Maternal and perinatal health research.....	17
1.5 Outline and aims for this thesis.....	18
CHAPTER 2 Australian randomised controlled trials and Cochrane systematic reviews in maternal and perinatal health: study characteristics and impact.....	20
2.1 Overview.....	20
2.1.1 How impact can be measured.....	20
2.1.2 Why we need to measure impact of Australian randomised controlled trials and Cochrane systematic reviews in maternal and perinatal health.....	21
2.2 Aims and hypotheses for cohorts of Australian maternal and perinatal randomised controlled trials and Cochrane systematic reviews.....	21
2.3. Methods.....	23
2.3.1 Overview of methods.....	23
2.3.2 Australian maternal and perinatal randomised controlled trials: 1986-2010 cohort	23
2.3.3 Later cohort of Australian maternal and perinatal trials: 2011-2014.....	25
2.3.4 Altmetric scores of Cochrane systematic reviews with Australian authorship and/or including Australian maternal and perinatal trials.....	25
2.4 Results	26
2.4.1 Characteristics of Australian maternal and perinatal randomised controlled trials published between 1986 and 2010.....	26
Table 2.1: Summary of characteristics of Australian maternal and perinatal randomised controlled trials published 1986-2010 (N = 306).....	26
Fig 2.1: Sample sizes of Australian maternal and perinatal randomised controlled trials 1986-2010.....	27
Fig 2.2: Flow diagram of publication status of Australian maternal and perinatal RCTs... ..	27
Fig 2.3: Citations of Australian maternal and perinatal trials 1986-2010 (Scopus Dec 2013); n = 306	27
Fig 2.4: Intervention category of Australian maternal and perinatal trials.....	29
Table 2.2: Australian maternal and perinatal randomised controlled trials with 150 or more citations (Scopus December 2013)	30

2.4.2	Citation rates of Australian maternal and perinatal randomised controlled trials and their integration into Cochrane systematic reviews and clinical practice guidelines	31
2.4.2.1	Citation rates of Australian maternal and perinatal randomised controlled trials	31
	Table 2.3: Sample size and citation rate analysis (Fisher's exact test)	32
2.4.2.2	Integration of Australian maternal and perinatal randomised controlled trials into syntheses	32
2.4.2.3	Integration into policy documents	33
2.4.3	Differences in Australian maternal and perinatal randomised controlled trials over time: 1986-2010 versus 2011-2014	33
	Fig 2.5: Sample sizes of Australian maternal and perinatal randomised controlled trials: 1986-2010 compared with 2011-2014	34
2.4.4	Social network (Altmetric) analysis of Australian maternal and perinatal Cochrane systematic reviews	34
	Table 2.4: Maternal and perinatal Cochrane reviews by Cochrane Group (as at November 2014)	34
	Table 2.5: Altmetric scores of Australian maternal and perinatal Cochrane systematic reviews (n = 359) and citation in clinical practice guidelines	35
2.5	Discussion	36
2.6	Conclusions	39
CHAPTER 3 Impact of Australian randomised controlled trials and Cochrane systematic reviews in maternal and perinatal health: survey of triallists		
		41
3.1	Overview	41
3.2	Aims and hypotheses	42
3.3	Methods	43
	Fig 3.1: Behaviour change wheel (Michie 2014)	44
	Table 3.1: Map of survey questions	45
3.4	Results	46
3.4.1	Survey responses	46
	Fig 3.2: Flow diagram of survey response from triallists	46
3.4.2	Responses to Question 1-10	47
	Fig 3.3: Responses from Australian triallists relating to their fellow health professionals' opportunity and capability to implement trial findings (Questions 1-4)	50
	Fig 3.4: Question 8: Triallists' rating of implementation/uptake of trial findings into Australian practice	53
	Fig 3.5: Question 10: CHANGE in triallists' ratings of actual (current) outcome compared with perceived potential impact	55
3.4.3	Triallists' ratings of uptake and impact of their trial findings and associations with behaviour change	55
3.4.4	Triallists' ratings of uptake of trial findings and impact on health outcomes and associations with trial characteristics	56
3.5	Discussion	57
3.6	Conclusions	59

Chapter 4: Reminder strategies for reducing risk of type 2 diabetes in women with a history of gestational diabetes: synthesis and generation of new knowledge	61
4.1 Introduction and overview:	61
4.2 Aim of chapter	62
4.3 ‘Reminder systems for women with previous gestational diabetes mellitus to increase uptake of testing for type 2 diabetes or impaired glucose tolerance’: a Cochrane systematic review (Middleton 2014a)	62
4.3.1 Background.....	62
4.3.2 Objectives and Methods	62
4.3.3 Results of Cochrane systematic review	63
Table 4.1 Summary of findings for ‘Reminder systems for women with previous gestational diabetes mellitus to increase uptake of testing for type 2 diabetes or impaired glucose tolerance’	65
Fig 4.1: Forest plot of uptake of postpartum oral glucose test	66
4.3.4 Discussion	66
4.3.5 Cochrane Systematic Review conclusions.....	67
4.4 The DIAMIND (diabetes reminder) randomised controlled trial: study protocol	67
4.5 Discussion and next steps.....	68
Fig 4.2: Research/translation cycle: Increasing uptake of postpartum testing for type 2 diabetes in women with a history of GDM.....	69
Chapter 5 Stillbirth prevention: knowledge translation and implementation	71
5.1 Introduction.....	71
5.2 Reporting of stillbirth as an outcome in Cochrane systematic reviews	71
5.2.1 Aims.....	71
5.2.2 Methods	72
5.2.3 Results	72
Table 5.1: Reporting of stillbirth in Cochrane reviews (Cochrane Library 4/2009: n = 254)	72
5.2.4 Discussion	72
5.2.5 Conclusions.....	73
5.3 Stillbirths: the way forward in high-income countries (summary of Flenady, Middleton et al 2011a)	73
5.3.1 Aims.....	73
5.3.2 Methods	73
5.3.3 Results	74
5.3.4 Conclusions.....	75
5.4 Major risk factors for stillbirth in high-income countries (summary of Flenady, Middleton et al: Lancet 2011b)	75
5.4.1 Aims.....	75
5.4.2 Methods	75
5.4.3 Results	76
Table 5.2: Most important potentially modifiable and demographic risk factors and attributable stillbirths in HIC.....	76

5.4.4	Discussion	76
5.5	Overview of interventions during the antenatal period for preventing stillbirth	76
5.5.1	Aims	76
5.5.2	Methods.....	77
5.5.3	Results.....	77
	Table 5.3 Antenatal interventions reporting stillbirths in Cochrane systematic reviews	79
	<i>(clear differences shown in green shading)</i>	79
5.5.4	Discussion	83
5.6	Citation analysis of the two Lancet high income country stillbirth papers (Flenady, Middleton et al 2011a; Flenady, Koopmans, Middleton et al 2011b)	83
5.6.1	Aim.....	83
5.6.2	Methods.....	83
5.6.3	Results.....	84
	Fig 5.1: HIC and SR paper citations by year from 2011 to 2015 (Google Scholar and Scopus combined).....	85
	Fig 5.2: Low, medium or high impact citations for the HIC and SR paper	86
5.6.4	Discussion	86
5.7	Overall Conclusions.....	86
	Fig 5.3: Research/translation cycle for stillbirth prevention and management in high income countries.....	87
Chapter 6: Antenatal magnesium sulphate for fetal, infant and child neuroprotection: synthesis, translation and implementation		89
6.1	Introduction	89
	Fig 6.1: Research/translation cycle: antenatal magnesium sulphate for fetal neuroprotection	90
6.2	Overall aims.....	91
6.3	Knowledge synthesis: ‘Magnesium sulphate for women at risk of preterm birth for neuroprotection of the fetus’ (Cochrane systematic review).....	91
	Fig 6.2: Risk of bias for trials included in ‘Magnesium sulphate for women at risk of preterm birth for neuroprotection of the fetus’ (Cochrane systematic review: Doyle 2009) 93	
	Fig 6.3: Cerebral palsy forest plot: Magnesium sulphate versus placebo (Doyle 2009) .94	
	Fig 6.4: Death or cerebral palsy forest plot: Magnesium sulphate versus placebo (Doyle 2009)	94
6.4	Making knowledge actionable: Antenatal Magnesium Sulphate for Neuroprotection Guidelines	95
6.5	Implementation; Audit and feedback: The WISH Project (Working to Improve Survival and Health for babies born very preterm).....	99
6.5.1	Aims of the WISH Project.....	99
6.5.2	Methods.....	99
6.5.3	WISH Project results	101

Fig 6.5: Antenatal magnesium sulphate uptake for neuroprotection in nine Australian and New Zealand hospitals in 2013.....	102
Fig 6.6: Uptake of antenatal magnesium sulphate for neuroprotection at WCH 2009-12 (derived from medical records)	102
6.5.4 Discussion and next steps	104
6.6 Overall conclusions.....	106
Chapter 7 Concluding remarks	107
7.1 Summary and significance of findings	107
7.2 Incorporating impact: the research, translation and impact cycle	109
Fig 7.1 Research, translation and impact cycle: steps and strategies	110
7.3 What's still to be done?	111
References	113

Abbreviations

ACOG:	American College of Obstetrics and Gynecology
aCSR:	Australian Cochrane systematic review
ACPR:	Australian Cerebral Palsy Register
ACTA:	Australian Clinical Trials Alliance
ADA:	American Diabetes Association
AIHW:	Australian Institute of Health and Welfare
AMICABLE:	The Antenatal Magnesium Individual participant data international Collaboration: Assessing the Benefits for babies using the best Level of Evidence
AMSTAR:	Assessment of the Methodological Quality of Systematic Reviews
ANZCTR:	Australian and New Zealand Clinical Trials Registry
ANZNN:	Australian and New Zealand Neonatal Network
aOR:	adjusted odds ratio
ARC:	Australian Research Council
ARCH:	Australian Research Centre for Health of Women and Babies
ART:	antiretroviral therapy
BCW:	Behaviour Change Wheel
BMI:	body mass index
CDSR:	Cochrane Database of Systematic Reviews
CI:	confidence interval
CINAHL:	Cumulative Index to Nursing and Allied Health Literature
CPG:	clinical practice guideline
CSR:	Cochrane systematic review
CTG:	cardiotocography
DIAMIND:	<u>Diabetes Reminder</u>
ERA:	Excellence in Research for Australia
FENO:	fraction of exhaled nitric oxide
FORM:	Formulating Optimal Recommendations Methodology
g:	gram
GAP:	Guideline Action Pack
GBD:	Global Burden of Disease
GDM:	gestational diabetes mellitus
GRADE:	Grading of Recommendations Assessment, Development and Evaluation
HbA1c:	glycated haemoglobin
HIC:	high income country
HIV:	human immunodeficiency virus
IADPSG:	International Association of the Diabetes and Pregnancy Study Groups
ILCOR:	International Liaison Committee on Resuscitation
IMPACT Network:	Interdisciplinary Maternal Perinatal Australasian Collaborative Trials Network
IPD:	individual participant data
IV:	intravenous
JAMA:	Journal of the American Medical Association
kg:	kilogram
LMIC:	low-middle income country
m:	metre
mmHg:	millimetre mercury
mL:	millilitre
mmol:	millimole
MOOSE:	Meta-analysis of Observational Studies
NEJM:	New England Journal of Medicine
NHMRC:	National Health and Medical Research Council

NICE:	National Institute for Health and Care Excellence
NICS:	National Institute of Clinical Studies
OGTT:	oral glucose tolerance test
OR:	odds ratio
pa:	per annum
PAR:	population attributable risk
Periconc.:	periconceptual
PLoS:	Public Library of Science
PSANZ:	Perinatal Society of Australia and New Zealand
RCOG:	Royal College of Obstetricians and Gynaecologists
RCT:	randomised controlled trial
RevMan:	Review Manager
RR:	risk ratio
RRR:	relative risk ratio
SAMe:	S-adenosylmethionine
SD:	standard deviation
SGA:	small for gestational age
SMS:	short message service
SOGC:	Society of Obstetricians and Gynaecologists of Canada
SOMANZ:	Society of Obstetric Medicine of Australia and New Zealand
SPIRIT:	Standard Protocol Items: Recommendations for Interventional Trials
SR:	systematic review
TDF:	Theoretical Domains Framework
TRIS:	Translational Research Impact Scale
UDCA:	ursodeoxycholic acid
UK:	United Kingdom
USA:	United States of America
Vs.:	versus
WCH:	Women's and Children's Hospital
WISH:	<u>W</u> orking to <u>i</u> mprove <u>s</u> urvival and <u>h</u> ealth for babies born very preterm
WHO:	World Health Organization
WOMBAT Collaboration:	<u>W</u> omen and <u>B</u> abies Health and Wellbeing: <u>A</u> ction through <u>T</u> rials Collaboration
YCHD:	Yinchenghao decoction

Abstract

Background: There is an increasing expectation by governments and communities that health research will lead to health and health system improvements, yet developing the necessary science behind translation and implementation of research findings into policy and practice has been neglected and underfunded.

Aims:

- to investigate the contribution made by Australian randomised controlled trials and Cochrane systematic reviews in maternal and perinatal health to improvements in the health and wellbeing of women, babies and their families in Australia and internationally;
- to evaluate different ways of assessing impact and to identify the most effective methods for informing future strategies to improve generation, synthesis, translation and implementation of research into health impact.

Methods: I used mixed methods (bibliometric and social media analyses; survey of triallists (quantitative and qualitative); case studies; systematic reviews of observational studies; systematic reviews of interventions; an overview; cohort studies; a randomised controlled trial; clinical practice guidelines; and implementation studies). I used behaviour change theory to explore uptake and implementation of research and developed a research, translation and impact cycle to chart the flow from knowledge to impact.

For the cohort of Australian maternal and perinatal randomised controlled trials, I compiled a database of all known trials published between 1986 and 2014. For the survey of triallists I developed a questionnaire using the Behaviour Change Wheel to assess perceptions related to capability, opportunity and motivation and the influences of these on uptake and implementation.

Results: In a cohort of over 500 Australian maternal and perinatal randomised trials, multi-centre design, National Health and Medical Research Council or equivalent funding, and larger sample sizes were associated with higher citation rates, increased inclusion in syntheses and policy documents. More recent trials (published from 2011-2014) also showed improvements compared with trials from 1986-2010.

In the survey of triallists, fellow health professionals were thought to be aware of trial findings only 50% of the time, but skill deficits were not major barriers to implementation. When trial results were widely known, confidence in the findings was sometimes low. Trials with null results were difficult to interpret and there was some lack of clarity about who should be responsible for translation and implementation.

Emerging citation and social media systems such as Altmetric could increase visibility of research and change some of the ways that impact is currently measured.

In three case studies addressing different stages of translation, I have demonstrated how integrating a research, translation and impact cycle with behaviour change theory can explain, predict and shape practice and policy change. These case studies were: closing an important research gap (reminder systems for women with previous gestational diabetes); initiatives to highlight the importance of stillbirth and its prevention (including development of a tool to assess the impact of bibliographic citations); and the implementation of antenatal magnesium sulphate for fetal neuroprotection (a project exemplifying rapid and effective implementation).

Conclusions: Maternal and perinatal research in Australia has made a major contribution to better health and health systems. I have shown that this impact could be even greater with improved translation processes such as making research more implementation ready, strengthening networks and using coordinated approaches to accelerate uptake and impact.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or tertiary university and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

In addition, I certify that no part of this work will in the future be used in a submission for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint award of this degree.

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Philippa Middleton
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List of key publications authored/co-authored by Philippa Middleton

Chapter 4:

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