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# **Nomenclature for models of maternity care: literature review, July 2012**

**Foundations for enhanced maternity data collection  
and reporting in Australia: National Maternity Data  
Development Project Stage 1**





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*Authoritative information and statistics  
to promote better health and wellbeing*

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**Foundations for enhanced maternity data collection and reporting  
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**National Maternity Data Development Project Stage 1**

Australian Institute of Health and Welfare  
Canberra

Cat. no. PER 62

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ISBN 978-1-74249-611-5

### **Suggested citation**

Australian Institute of Health and Welfare 2014. Nomenclature for models of maternity care: literature review, July 2012—Foundations for enhanced maternity data collection and reporting in Australia: National Maternity Data Development Project Stage 1. Cat. no. PER 62. Canberra: AIHW.

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Published by the Australian Institute of Health and Welfare

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# Acknowledgments

The main authors of this report were Ms Natasha Donnelly, Professor Elizabeth Sullivan (formerly of) and Dr Lisa Hilder of the Australian Institute of Health and Welfare (AIHW) National Perinatal Epidemiology and Statistics Unit (NPESU). AIHW colleagues are thanked for their assistance in preparing this report.

The AIHW and the NPESU would like to acknowledge the time, effort and expertise contributed by members of the Nomenclature for Models of Care Working Party as well as the staff members of the state and territory health authorities who contributed to this work.

The AIHW acknowledges funding from the Australian Government Department of Health for the National Maternity Data Development Project.

# Abbreviations

AIHW	Australian Institute of Health and Welfare
AR-DRG	Australian Refined Diagnosis Related Groups
DSS	Data Set Specification
GP	general practitioner
ICD-10-AM	International Classification of Diseases 10th edition Australian Modification
MaCCS	Maternity Care Classification System
MMC(s)	Major Model Category (ies)
NMDDP	National Maternity Data Development Project
NMDS	National Minimum Data Set
NMoCWP	Nomenclature for Models of Care Working Party
NMSP	National Maternity Services Plan
NPESU	National Perinatal Epidemiology and Statistics Unit
PDC	Perinatal Data Collection
SNOMED CT	Systematized Nomenclature of Medicine Clinical Terms
WUDWAW	Who Usually Delivers Whom and Where

# Summary

## Background

The report of the Maternity Services Review stated that while there were a variety of models of maternity care in Australia, the dominant models involved medical care in either a private or public hospital, and consumers were dissatisfied with the lack of access to other models of care (Commonwealth of Australia 2009). The report also highlighted the lack of standardised terminology and definitions to identify and differentiate models of maternity care in Australia. To address these and other issues identified in the Review and subsequent National Maternity Services Plan (Australian Health Ministers' Conference 2011), the then Australian Government Department of Health and Ageing engaged the AIHW, working with the National Perinatal Epidemiology and Statistics Unit (NPESU), to undertake the National Maternity Data Development Project (NMDDP).

## Literature review

This report provides an overview of the literature that relates to models of maternity care and to developing an appropriate nomenclature. In examining the literature, the uses and usefulness of such a nomenclature were considered, including its ability to meet the needs of data collection in Australia. The review was not meant to identify which aspects of models of care are more important or which overall models produce better outcomes. Rather, the literature was examined for the characteristics of different models of care which would enable existing and future models of maternity care to be clearly defined and identified.

## Results

The literature review found no attempts in Australia or internationally to develop a standard nomenclature or taxonomy for models of maternity care. The results showed that while there are broad categories of models of care in Australia (Major Model Categories), there are substantial variations within them. Models of care are also constantly evolving; and so, a nomenclature that does not allow for this dynamic will not be meaningful or useful. Models of care are a complex concept and have many components, all of which may impact on the quality and outcomes of maternity care experienced by women and their babies.

The literature review identified the characteristics that differentiate models of care and grouped them into three broad domains, the characteristics of: the women cared for in the model; the care providers working in the model; and the care provided in the model.

## Models of Care Framework as the basis of a classification system

The concept for a framework to define models of care was initially proposed by members of the NMDDP Advisory Group. Based on the literature review, this draft framework was enhanced and further developed. The framework has three main dimensions (Women, Carers, Care), each with a number of data elements and sample data values that describe models of care. This framework will inform the development, initially, of a data set specification which could be used in conjunction with the broader Major Model Categories as a system to classify maternity models of care. A structured classification system will enable data on models of maternity care and outcomes for women and babies to be collected, analysed and reported on a national basis.



# 1 Introduction

## 1.1 Background

Before the 1940s, maternity care in Australia was mostly delivered in the home, with the family doctor providing antenatal care and a midwife attending the birth in the home. There was a gradual shift over the following two decades towards hospital-based maternity care, with an increasing focus on obstetric specialist care. The role of the midwife began to change towards one of 'obstetric nurse' – assisting doctors in the newly medicalised model of maternity care. This shift from home to hospital occurred at a similar time across many industrialised nations, although at a different pace in some countries and for a different range of reasons (Declercq et al. 2001). Benoit et al. (2010) describe the simultaneous processes of the dominance of the medical profession over maternity care where pregnancy and childbirth were managed as an 'illness', and the transition from birthing at home to the increasingly technological surrounds of the hospital.

Increasing government interest and involvement in health care in the 1970s resulted in two important but different effects on maternity care: the competing demands of other professional groups such as midwives and nurses finding a voice, and the active consultation and consideration of health consumers (Benoit et al. 2010). The influence of both political and social contexts resulted in the continued dominance of obstetric models of care (particularly aided by government policies in Australia promoting the uptake of private health insurance). At the same time, there was increasing criticism of the resulting negative impact on women's experience of pregnancy and birth and a demand for more socially-oriented models, such as those provided by midwives (Benoit et al. 2010; Bryers 2010).

Despite Australia having one of the lowest maternal and perinatal mortality rates in the world (WHO 2011), the Australian Government recognised that it was not meeting all the needs of Australian women (Commonwealth of Australia 2009). In 2008, the paper *Improving maternity services in Australia: a discussion paper from the Australian Government* had been released, which began the process of consultation that would become the Maternity Services Review (Commonwealth of Australia 2008). The aims of the Review, led by Commonwealth Chief Nurse and Midwifery Officer Rosemary Bryant, were to:

- elicit a range of perspectives on maternity services in Australia
- identify key gaps in current arrangements
- determine what change is required
- determine what is needed for change to occur
- inform the priorities for national action, and the development of the National Maternity Services Plan (NMSP).

The Review considered issues relevant to maternity services, including antenatal services, birthing options, postnatal services up to 6 weeks after birth, and peer and social support for women in the perinatal period (Commonwealth of Australia 2009:1).

The Review report stated that while there were a variety of models of care in Australia, the dominant models involved medical care in either a private or public hospital setting, and consumers were not satisfied with the lack of access to other models of care (Commonwealth of Australia 2009). The four main models, providing care to 92.7% of women, were private maternity care, combined maternity care, public hospital care and shared maternity care.

Although the Review report listed a range of available models previously identified by the Australian Medical Workforce Advisory Committee (AMWAC 2004), it highlighted the lack of standardised terminology and definitions to identify and differentiate models of maternity care in Australia.

In 2009, a review was conducted of existing Australian maternity data collections to determine their scope, both national and jurisdictional, as well as data gaps and opportunities for data development (AIHW 2011a). One key data gap identified was the lack of nationally agreed definitions for models of maternity care that account for variations in service delivery between institutions and jurisdictions. As the Maternity Services Review recommended increasing the availability of models of care that increase continuity of carer – in particular, midwifery continuity of care – there was a need to develop definitions that would also accommodate and differentiate between these models.

The NMSP (AHMC 2011) took into consideration the recommendations of the Maternity Services Review, as well as other reviews and initiatives, and provides a strategic framework for guiding the development of policy and program development for Australian maternity services. The NMSP includes actions that rely on access to consistent information on maternal and perinatal mortality and morbidity as well as to data relating to models of care. It acknowledged the need to improve in the capture and reporting of this information.

To address this need, the former Australian Government Department of Health and Ageing engaged the Australian Institute of Health and Welfare (AIHW), working with the National Perinatal Epidemiology and Statistics Unit (NPESU), to undertake the National Maternity Data Development Project (NMDDP). The aim of the Project is to develop a nationally consistent and comprehensive maternal and perinatal morbidity and mortality data set in Australia. Standardising a nomenclature and definitions for models of maternity care would allow data to be collected nationally to facilitate meaningful analysis and comparisons of maternal and perinatal outcomes in differing models of care. This would also enable evaluation of many of the actions of the NMSP that rely on data about models of care, both their availability to women and outcomes from different models.

The NMDDP Advisory Group identified a starting framework developed by Dr Michael Nicholl, the obstetric expert on the Advisory Group, as the basis for beginning work on the Models of Care project component. This framework would be a critical driving factor of the literature review. Features of the proposed framework included:

- characteristics of women (risk stratification)
- characteristics of carers
- how different professions organise their work (solo, doubles, multiples)
- issues related to place and timing of birth
- issues related to capturing the spectrum of care from pre-conception to the end of the postnatal period.

The original framework proposed by Dr Nicholl is provided at Table 1.1.

**Table 1.1: Original framework proposed by Dr Michael Nicholl (14 November 2011)**

Characteristics	Elements
Client	Level of assessed risk: high or low Specific risk types: pre-existing illness/ gestational illness / pregnancy
Carer	Qualifications (medical, midwifery, nursing, general practitioner, registered Aboriginal health worker) Position (experience) value domains to be discussed
Care (Working practices and relationships with other health carers)	Type of care: Caseload / Team /Shared /and so on Multidisciplinary: Yes / No Continuity of care/carer(s): (value domains to be discussed) Health sector: public / private
Care location (Elements describing the location of maternity care at different stages [antenatal, intrapartum, postpartum])	Place of <b>antenatal</b> care: hospital antenatal clinic, community maternity clinics, general practice clinics, home, remote/outreach clinics on country Place of <b>intrapartum</b> care: hospital labour ward, birth centre co-located or offsite, midwifery-led units/ level 2 units, general practitioner units, rural units(?), home, on country Place of <b>postpartum</b> care: as for intrapartum plus hospital postnatal ward, community hospital, Tresillian centres
Communications (Other dimensions of care related to capturing the spectrum of care from pre-conception to the end of the postnatal period)	Method of entry to /exit from maternity care (domain values to be discussed): referred by (or to) general practitioner Change of maternity care within maternity care (domain values to be discussed) Reasons for change in dimensions 1–4 (domain values to be discussed)

## 1.2 Nomenclature

While the purpose of this paper is to present the findings of a literature review about definitions of maternity models of care, it is being done to inform the development of a standardised nomenclature for such models in Australia.

It is important to examine what is meant by a ‘nomenclature’ and to differentiate between this and a ‘classification system’. At its most basic, a ‘nomenclature’ is a body of terms and their definitions (Amatayakul 2009) – much like a glossary. In a healthcare domain, however, a nomenclature is more precisely a system for naming specific terminology or vocabulary (Amatayakul 2009). In contrast, a classification system is a structured way to organise and categorise information using a defined set of rules for grouping items with similar characteristics for a defined purpose (Amatayakul 2009). A nomenclature used on its own is not enough to classify items of a complex nature, but it does provide a common understanding or meaning of an object.

For the purposes of this paper and the recommendations to follow, the term ‘nomenclature’ is a common understanding of, definition of or glossary for the broadly named models of care currently developed or in use in Australia. However, a structured framework or ‘classification system’ to accurately classify models would be required to enable accurate analysis and comparisons to be made between models of care.

## 1.3 Purpose of this paper

The NMSP includes a range of actions to increase access to a wider range of maternity models of care for Australian women and to ensure the capture of consistent data items across all jurisdictions to enable national reporting on maternal and perinatal outcomes (AHMC 2011). Identifying in which models of care women are participating will allow the success of many of the actions of the NMSP to be evaluated.

The purpose of this paper is to provide an overview of the literature that relates to models of maternity care and to developing an appropriate nomenclature. (The literature includes national and jurisdictional policy documentation and published literature from Australia and internationally.) In examining the literature, the uses and usefulness of such a nomenclature were considered, and its ability to meet the needs of the data collections in Australia (as outlined in the NMSP). The Nomenclature for Models of Care Project was not meant to identify which aspects of models of care are more important or which overall models produce better outcomes. The available literature does not provide this evidence. The paper examines the published and grey literature for evidence of which characteristics can be isolated from different models of care to enable existing, and future, models of maternity care to be clearly defined and identified.

The paper concludes with recommendations for developing a structured classification system for models of maternity care in Australia that will produce a new data item of 'Model of Care' for use in jurisdictional Perinatal Data Collections (PDCs) as part of the Perinatal National Minimum Data Set (NMDS).

## 1.4 Structure of this paper

This chapter provides background information on the development of maternity care in Australia and the context of the NMDDP. It includes an introduction to the concepts of nomenclatures, taxonomies and classification systems and how these are defined.

Chapter 2 details the method used for the literature review on models of maternity care and the development of nomenclatures and classification systems.

Chapter 3 presents further detail on characteristics of nomenclatures and classifications, particularly in a healthcare context.

Chapter 4 presents the results of the literature review on maternity models of care, identifying policies and reports from both jurisdictional and national sources as well as published literature from Australian and international studies. The chapter concludes with a table of categories of models of maternity care in Australia that could be used as a nomenclature of Major Model Categories (MMC).

A discussion is developed in Chapter 5, examining the results of the literature review in the context of developing a system to classify Australian models of maternity care. This chapter includes a framework that provides a way to identify common elements that exist in models of care that will inform the development of a Data Set Specification (DSS).

The paper concludes with recommendations for the next steps in developing a system to classify maternity models of care in Australia.

## 2 Method

Members of the NMDDP initially proposed the concept of a framework to categorise models of care. This framework provided a platform to develop research questions for the literature review, involving a systematic search and review of both the published literature and the jurisdictional/national policy documentation relating to maternity models of care as well as the development of nomenclatures and classification systems. The following approach was used:

- identify appropriate search terms, calling on the expertise of members of the Nomenclature for Models of Care Working Party (NMoCWP) (see Appendix A for a list of NMoCWP members)
- use the draft framework to further identify appropriate search terms
- conduct searches using web and peer-review databases
- contact jurisdictional maternity services units, professional organisations and colleges and NMoCWP members for grey literature and policy documents
- review relevant material
- synthesise the material using a standard framework.

Maternity models of care are a complex construct as the models cover different subject areas. Conventional search techniques using subject headings alone did not produce satisfactory results. Repeated searches using an extensive combination of phrases and techniques were required to identify relevant literature. As well as traditional subject heading searches, other techniques suggested by Papaioannou et al. (2009) such as 'pearl growing' were used. This involved further searches based on terms used in the bibliographic indexes of databases that indexed the major research (or 'pearls') related to models of care.

An extensive search of the academic literature was conducted using combinations of the following terms and headings:

- antenatal care
- caseload
- continuity of patient care
- delivery, obstetric
- delivery of health care
- freestanding birth centre
- general practitioner (GP) shared care
- group practice
- intrapartum care
- maternal health service
- maternity care
- medical informatics/classification (or MeSH)
- midwifery
- midwifery-led care
- model AND maternity

- models, nursing
- models of care
- models, organisational
- multidisciplinary model
- nomenclature AND health
- nomenclature AND maternity
- nurse midwives
- obstetrics
- patient-centred care
- patient journey
- period of care (intrapartum, antenatal, postpartum)
- postnatal care
- pregnancy
- prenatal care
- taxonomy development AND health
- team midwifery
- women-centred care/woman-centred care
- woman's journey.

A snowball approach was then used to acquire additional material following the detailed searches (using the terms above) and further literature was sourced from members of the NMoCWP. Initially, searches were restricted to literature published after 2000; however, additional searches were repeated with no date restrictions after relevant literature was identified in reference lists.

Databases included in the literature search were accessed via the University of New South Wales gateway Sirius to enable simultaneous metasearches, with some databases being searched directly. There was some overlap among the databases. Databases searched were:

- Cochrane Database of Systematic Reviews (hereafter Cochrane Review)
- Cumulative Index to Nursing and Allied Health Literature
- JSTOR
- MD Consult Australia.
- Medline
- Ovid
- Proquest
- Science Direct
- Scopus
- Web of Science

A targeted Google search was also conducted to locate further grey literature using the criteria 'model of care, filetype:pdf' and the name of each Australian state and territory. The Google search engine indexes document types such as the Adobe® portable document format (PDF). This index can be accessed by using 'filetype:pdf', which allows the researcher to

refine their search (Henninger 2003). PDF file format restriction search achieved the best results compared with regular search, title search and exact phrase search (Zhang & Fei 2010).

In this way, a preliminary search for policy documents and government reports was undertaken to find publicly available information and grey literature that may not have been located in the other database searches – a technique used in other systematic literature searches (Hoffmann et al. 2011). The search of peer-reviewed literature, policy documents and other grey literature resulted in 211 relevant documents. Not all of this literature is cited in this paper; some of it contributed to the overall understanding of maternity care options in Australia and overseas as well as to the sociological and political influences that have played a part in developing different models of care.

### 3 Nomenclatures, taxonomies and classification systems

Although the terms are often used interchangeably, there are differences between a nomenclature and a classification system. This distinction is important to understand to ensure the appropriate process is followed to develop a means of identifying models of maternity care in Australia in a way that enables collection, analysis and reporting of outcomes for mothers and babies.

A nomenclature is a language system or a body of agreed terms. One of the best known nomenclatures in health care is the Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT). It has been designed to provide a standardised set of terms, concepts and relationships that allows communication, aggregation and comparison of data relating to health care. SNOMED CT is highly complex, but it provides a common language to allow consistent capturing and sharing of health data and can be mapped to a range of other terminologies, classification systems and vocabularies (Amatayakul 2009). SNOMED CT has a hierarchical structure composed of concepts, descriptions and relationships. The benefit of using SNOMED CT is that it enables the translation of individually worded statements (for example, patient had a broken left femur) into agreed standardised terminology that can be coded regardless of the natural wording used (# L femur). It allows equal elements to be compared without ambiguity.

However, SNOMED-CT is not a 'tool' or a taxonomy to classify or group information. It is purely a means for standardising clinical information and must be used in conjunction with other tools and systems that employ the standard language provided by the nomenclature. It provides a standardised language that breaks down clinical information into simple 'chunks' that can be combined into more detailed concepts and statements.

In contrast, a classification system results from the use of a defined set of rules (also known as a taxonomy) for grouping items with similar characteristics for a defined purpose (Amatayakul 2009). One of the most widely used classification systems in health care is the International Classification of Diseases (ICD) and specifically in Australia the ICD-10-AM (Australian Modification) (National Centre for Classification in Health 2010). This system is used to classify and then code morbidity and mortality for acute patient episodes of care. Another related classification system is the Australian Refined Diagnosis Related Groups (AR-DRG). This enables grouping of similar episodes of care based on their ICD-10-AM codes in a hierarchical manner.

Both of these classification systems produce codes that can be stored in a variety of database and health information systems for use in analysis, research, funding and quality assurance activities. One of the defining features of both these systems is the ability to group items that have similar characteristics into higher level groupings for comparisons while still having sufficient precision to uniquely identify different conditions.

While a nomenclature provides a common language and set of terms, on its own it does not provide a method to classify and group information. This requires the use of a framework as the basis for a classification system. But models of care are complex constructs, with many varying identifying features that will not be adequately identified by a simple nomenclature. A more complex framework is needed to classify them.



## 4 Results

The results of the literature review have been separated into those relating to the development of nomenclatures, taxonomies and classification systems (Appendix B) and literature addressing models of care. Literature from Australia and internationally was reviewed and included if relevant to developing an Australian system for classifying maternity models of care.

### 4.1 Definitions of ‘model of care’

The origins of the use of the term ‘model of care’ appear to stem from the nursing profession, with suggestions that it has been ‘borrowed from fragmented role descriptions within nursing’ (Homer et al. 2008a:4). While the term is used often in the healthcare system, especially in relation to maternity care, it is difficult to define. In a review of the literature for developing its *Changing Models of Care Framework*, Queensland Health did not find a consistent definition and determined it was ‘a multifaceted concept, which broadly defines the way health services are delivered’ (Queensland Health 2000:4). Davidson et al. developed this further, defining ‘model of care as ‘an overarching design for the provision of a particular type of health care service that is shaped by a theoretic basis, EBP [evidence-based practice] and defined standards’ (Davidson et al. 2006:49). Both of these definitions and the Queensland Framework indicate that there are both tangible (such as roles, structure, methods, location) and less-tangible (such as philosophy, culture, values) components that contribute to a ‘model of care’. The benefits of describing healthcare delivery in terms of ‘models’ are that it ensures that all staff working together in a particular area or unit are working in a similar way, within a similar framework and guided by a common set of goals (Davidson et al. 2006). Further, by defining a ‘model’ in a systematic way, care can be evaluated on a common basis.

### 4.2 Maternity models of care in Australia

A range of literature was reviewed to identify what maternity models of care were commonly referenced in Australia and whether there were common definitions or an existing nomenclature. Policies and reports by states and territories and the Australian Government are considered first, followed by a review of published information. International literature was also reviewed to determine whether there were existing nomenclatures or classifications of models of care that could assist with a local development. While some international studies of maternity models of care are included in this paper – particularly those that relate to the Cochrane Review of Midwife-led models of care – no international literature was identified that related to a specific nomenclature for maternity models of care. Only international studies relevant to models of care in use in Australia were included.

The literature identified for this review was heavily weighted towards midwifery-led models of care due to an increase in the development of these models in recent years. This is reflected in the amount of both policy documentation and published research. Discussion of maternity models of care has not been undertaken equally within general practice, evidenced by the lack of literature about those models.

## **Policies and reports—jurisdictional and national this is – test**

Appendix C provides an overview of the jurisdictional and national policies and reports reviewed. All jurisdictions had at least one policy or report that related to maternity models of care, but none provided prescriptive definitions for all models or which models must be used in the state or territory in question. A majority of policy documentation related to the principles of good maternity care and providing a range of different models of care. The aims of the policies are to guide health services, not to mandate what models will look like. Examples of this are two states which have developed ‘toolkits’ to help maternity services in developing midwifery continuity of care models (NSW Health 2012; Queensland Health 2012).

### **Reports on models of care**

Two states have conducted specific reviews of maternity models of care with resulting reports: in Victoria, the *WUDWAW – ‘Who Usually Delivers Whom and Where’ – a report on models of antenatal care* (Victorian Perinatal Data Collection Unit 1999) and the *Review of shared obstetric care* (Brown et al. 1999); and in Western Australia, the report *Models of maternity care: a review of the evidence* (Henderson et al. 2007). These were the only reports that specifically reviewed and documented existing models of care, although the report from Western Australia was not reviewing models of care specific to its own jurisdiction.

### **New South Wales**

The policy directive of the NSW Ministry of Health (NSW Health) *Maternity – towards normal birth* (2010) does not define specific models of care but does recommend ‘midwifery continuity of carer programs’ (NSW Health 2010:11) and directs health services to the national guideline document *Primary maternity services in Australia – a framework for implementation* (AHMAC 2008). Rather than specifying models of care, NSW Health provides a framework for health services to develop models with ‘best practice’ principles. In 2003, NSW Health released a document *Models of maternity service provision across NSW* (NSW Health 2003) to support the previous maternity services policy *NSW framework for maternity services* (NSW Health 2000). Despite its title, the 2003 document does not define individual models; rather, it details core principles for developing primary, secondary and tertiary maternity services. These core principles relate to:

- matching services to clinical need
- providing a ‘lead maternity carer’
- having continuity of care
- having integrated networks between primary, secondary and tertiary services.

As with the *Maternity – towards normal birth* policy, the other policies and reports reviewed from NSW Health encourage the development of midwifery-led continuity of care models within an integrated service network, with services matched to clinical need. The only definitions provided are in the report *Midwifery continuity of carer model tool-kit*, which defines the model of caseload midwifery within a group practice setting (NSW Health 2012). A ‘caseload midwife’ is one who cares for an agreed number of women per year as the primary caregiver. As well, the midwife will be a second or backup midwife for another primary midwife. An important distinction made in this document is that ‘Midwifery Group Practice’ is an organisational configuration rather than an actual model. It is a way for midwives who work in caseload to organise themselves.

## Victoria

Victoria has taken a similar approach to New South Wales, with a framework for health services based on providing an appropriate level of care for women within their communities. The Victorian Department of Health's *Future directions for Victoria's maternity services* (Victorian Department of Human Services 2004) outlines a plan and system that recognises birth as a normal process while acknowledging the need for access to appropriate levels of medical expertise when required.

The principles underpinning this Future Directions report are:

- ensuring safety and quality
- providing women with informed choice and greater control of their birthing experience
- achieving the right balance between primary level care and having access to appropriate levels of medical expertise when needed
- making the best use of the complementary skills of midwives, GPs and obstetricians
- enhancing a maternity team approach.

As in New South Wales, there is an emphasis on women receiving care from a consistent carer (or team of carers) throughout 'the continuum' of pregnancy, birth and the postnatal period (Victorian Department of Human Services 2004:4). Future Directions describes the important role of midwives and GPs in providing care and includes a commitment to increase midwifery continuity models.

Examples of continuity of care models listed are:

- shared care model (in most cases with a GP)
- caseload midwifery model (one midwife in the lead carer role)
- team midwifery care (a small team of midwives share the care of a woman).

The *Capability framework for Victorian maternity and newborn services* expands on the three levels of maternity care described in Future Directions (Victorian Department of Health 2010). It delineates the role of maternity care providers across Victoria according to level of service. It also defines the minimum standards for resources, workforce skills and service arrangements required to support services within a particular level. The Capability Framework does not propose particular models but 'is designed to guide health services in the provision of safe, effective and appropriate maternity care' (Victorian Department of Health 2010:5).

The 1999 Victorian report *WUDWAW – 'Who Usually Delivers Whom and Where' – a report on models of antenatal care* (Victorian Perinatal Data Collection Unit 1999) lists 18 models. A review of models of shared care by Brown et al. (1999) for the Victorian Department of Health defined 14 variations in models that were collectively known as 'shared obstetric care'. The recent report of the Victorian Auditor-General noted that many models have restricted availability and access despite the government's policy framework (Victorian Auditor-General 2011). In particular, the report highlighted that caseload models of care, with continuity provided by a primary midwife, were available in only 4 of 13 metropolitan health services, with very few in rural and remote Victoria. The report did identify the existence of a range of models targeted at vulnerable or disadvantaged populations (such as those for Aboriginal women; for women with complex medical, psychosocial and intellectual care requirements; and for disadvantaged women from lower socioeconomic areas).

While Victoria provided more information than other jurisdictions that identified different maternity models of care, there was still inconsistency in how those models were named.

## **Queensland**

Queensland Health does not have a policy for maternity services but, like New South Wales and Victoria, provides some guidance to health services in developing appropriate models of care for women in its area. A review of maternity services in 2004–2005 identified that, in 2002, 99% of women in Queensland received their maternity care in one of 3 broad models: private care with a private obstetrician in a private or public hospital, public care shared with a GP with care in a public hospital, and public care in a public hospital with midwives and doctors providing antenatal and intrapartum care (Hirst 2005). The remainder of women received their care in either a public birth centre or at home.

Although not having a policy on models of care, Queensland Health has a Clinical Services Capability Framework (like that in Victoria) that defines what services must be provided at each level of maternity service (Queensland Health 2011). It defines maternity care as either:

- low risk (primary care from a midwife or GP)
- moderate risk (secondary care from GP or obstetrician)
- high risk (tertiary care from a specialised multidisciplinary service).

As previously mentioned, the Queensland Nursing and Midwifery Office has developed an implementation guide for midwifery continuity of care models (Queensland Health 2012). This guide provides some definitions relevant to midwifery-led models of care but acknowledges that ‘in practice, models may not fit precisely into a definition’ (Queensland Health 2012:14). The definitions used for caseload and Midwifery Group Practice mirror those used in the New South Wales toolkit and are based closely on those used by Homer, Brodie and Leap (2008b). In addition to defining caseload models, the guide also defines ‘team midwifery’ as a model, where a woman receives all of her midwifery care from a small team (sometimes 6 to 8) without the continuity of a primary midwife. The guide is not prescriptive but does assist health services in defining some of the options for developing midwifery-led models: location of antenatal, intrapartum and postnatal care; target groups; philosophy of care; organisation of carers; and format of care delivery – group or individual care. These highlight some features that can define a particular model without concentrating on what the model is named.

## **Western Australia**

Western Australia has a number of documents focusing on models of care, including two reviews of models of maternity care and policies for home birth, an evaluation of outcomes and cost-effectiveness of models, and a review of models in the Aboriginal Community Controlled Health Sector (Doherty et al.2008; Henderson et al. 2007; McHugh & Hornbuckle 2011; Western Australian Department of Health 2007, 2011a, 2011b). Models of care recognised in these documents include:

- caseload midwifery care
- consultant-led care
- GP models of care
- shared care
- team midwifery care.

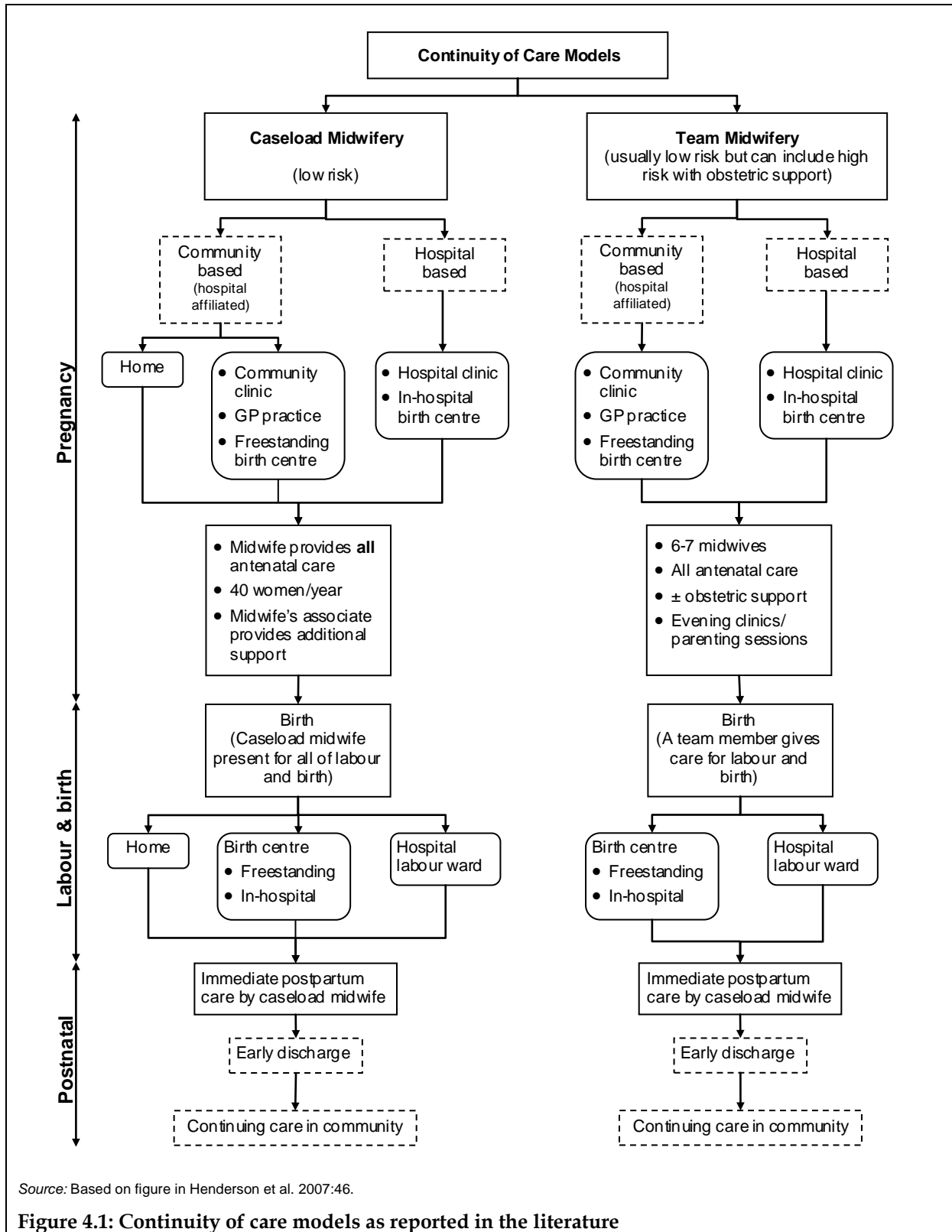
Some of the documentation identified models of care based on the location of care (Henderson et al. 2007). These include:

- antenatal day-stay units
- birth centres – freestanding and in-hospital
- domiciliary care
- planned home birth
- telemedicine programs.

The Western Australian policy framework separates the type of model from the location of care and defines the different locations. As for other jurisdictions, there is emphasis on providing midwifery-led continuity models of care with linkages between primary, secondary and tertiary services (Western Australian Department of Health 2007). The two reviews on models of care included reviewing the evidence from the literature for various models of care to inform policy development for maternity care; in doing so, there was some attempt to describe what the names of models meant (Henderson et al. 2007; Western Australian Department of Health 2011b). The Henderson report highlighted that the characteristics of the different models reviewed were not necessarily homogeneous. For example, in some models that were similarly named, there were differences in not only the risk groups included (some had only low-risk women, others had women of all risk groups) but also the location of care and the types and numbers of carers. Figure 4.1 (taken from the Henderson report) demonstrates how models named 'Continuity of Midwifery Care' might have different characteristics, despite sharing the same name.

In 2008, the State Health Research Advisory Council of the Western Australian Department of Health funded an evaluation of the outcomes and cost-effectiveness of a range of models of maternity care offered in Western Australia. These included 'traditional' hospital-based public models, GP shared care models and three different midwifery-led continuity of care models (Doherty et al. 2008). Characteristics that differed among the different models included the type of lead care-provider, the level of continuity, location of care, and risk status of women.

Although the broad definitions of different models of care in Western Australia are similar to those in the other jurisdictions (such as caseload, shared care and others), the variability in characteristics of models that share the same name highlights that simple names and definitions may not be enough to differentiate between models of care.



**Figure 4.1: Continuity of care models as reported in the literature**

### South Australia

The South Australian policy directive *Standards for maternal and neonatal services in SA 2010* provides guidance on role delineation for maternity services in the same way as the capability frameworks work in the other jurisdictions (SA Health 2009). The Standards

identify that the level of risk for pregnant women and their babies should determine the appropriate type and level of maternity services that women access. Some definitions of models of maternity care are provided in the Standards, including:

- Aboriginal family birthing programs
- birthing or birth centre
- caseload midwifery
- GP obstetric shared care
- Midwifery Group Practice
- midwifery-led care (team midwifery)
- private obstetric care
- traditional maternity care (hospital clinic).

This document defines some models differently from other jurisdictions. While these differences are only subtle, they do highlight how models of care are influenced by local context. In the South Australian Standards, 'midwifery-led care' is defined as a shared care arrangement between local GPs and small teams of midwives. This is different from the 'GP obstetric shared care' model where antenatal care is usually provided by a GP and staff at the local maternity unit. Like the other jurisdictions, location of care, number of providers and risk status are all characteristics that can vary within each type of model.

South Australia has a number of models of care specifically for Aboriginal women. These models incorporate the use of Aboriginal health workers, employed as Aboriginal Maternal and Infant Care workers (Morris 2008). These programs are not unique to South Australia, with other jurisdictions having similar models that involve a partnership with Aboriginal health workers (d'Espaignet et al. 2003; Kildea et al. 2010; McHugh & Hornbuckle 2011; NSW Health n.d.; Rumbold & Cunningham 2008).

Continuity of care by a known carer, in particular midwives, is recommended as part of best practice principles for maternity services in South Australia; however, this continuity may not be across the whole continuum (Country Health SA Maternity Services Steering Committee 2007). Particular models of care are not prescribed but, as with other jurisdictions, there are best practice principles to guide health services when developing local models of care (Country Health SA Maternity Services Steering Committee 2007). These principles include consideration of continuity of care, care location, risk category and types of care provider.

## **Tasmania**

No policy documents on models of care could be located for Tasmania, and development of models of maternity care rest with the individual health services. The Clinical Services Plan (DHHS 2007) lists the 'obstetric' services available at the three major acute public hospitals, including:

- GP obstetrician shared care
- high risk obstetric care
- midwifery care
- obstetrician-led care.

More specific information was obtained from the Royal Hobart Hospital (the main tertiary referral hospital in Tasmania) regarding the models of care offered there (Giannaros 2012). These include:

- Aboriginal and Torres Strait Islander women's antenatal clinics
- antenatal satellite midwives clinics
- Know Your Midwife scheme – KYM scheme (team midwifery model)
- Midwifery Group Practice (named midwife model)
- young mum's antenatal clinic.

Very brief information was provided to define what was involved in each model, but there were some similarities to definitions from other jurisdictions. The defining characteristics (regardless of the name of the model) related to type of carer, continuity of care, location of care, risk category, target group of women, and number of providers.

### **Australian Capital Territory**

Like Tasmania, there are only a limited number of hospitals providing maternity services in the Australian Capital Territory and there was also a limited amount of information available on the models of care. ACT Health provides guidelines for ACT Maternity Shared Care and this was the only policy information located (ACT Health 2008). The ACT Health website provided more information on the other models of care available and these included:

- Canberra Midwifery Program (low risk team midwifery and caseload with intention to birth at a birth centre)
- continuity at the Canberra Hospital – CatCH (all risk level caseload)
- GP shared care
- high risk pregnancy care through the Fetal Medicine Unit
- hospital antenatal clinics (traditional model)
- Parenting Enhancement Program – targeted program of antenatal care with a known midwife for two different vulnerable groups (young mum's group, and substance abuse in pregnancy group)
- private obstetric care.

Once again, the defining factors for these different models relate to the type of carer, location of care, type of continuity, risk group and number of carers.

### **Northern Territory**

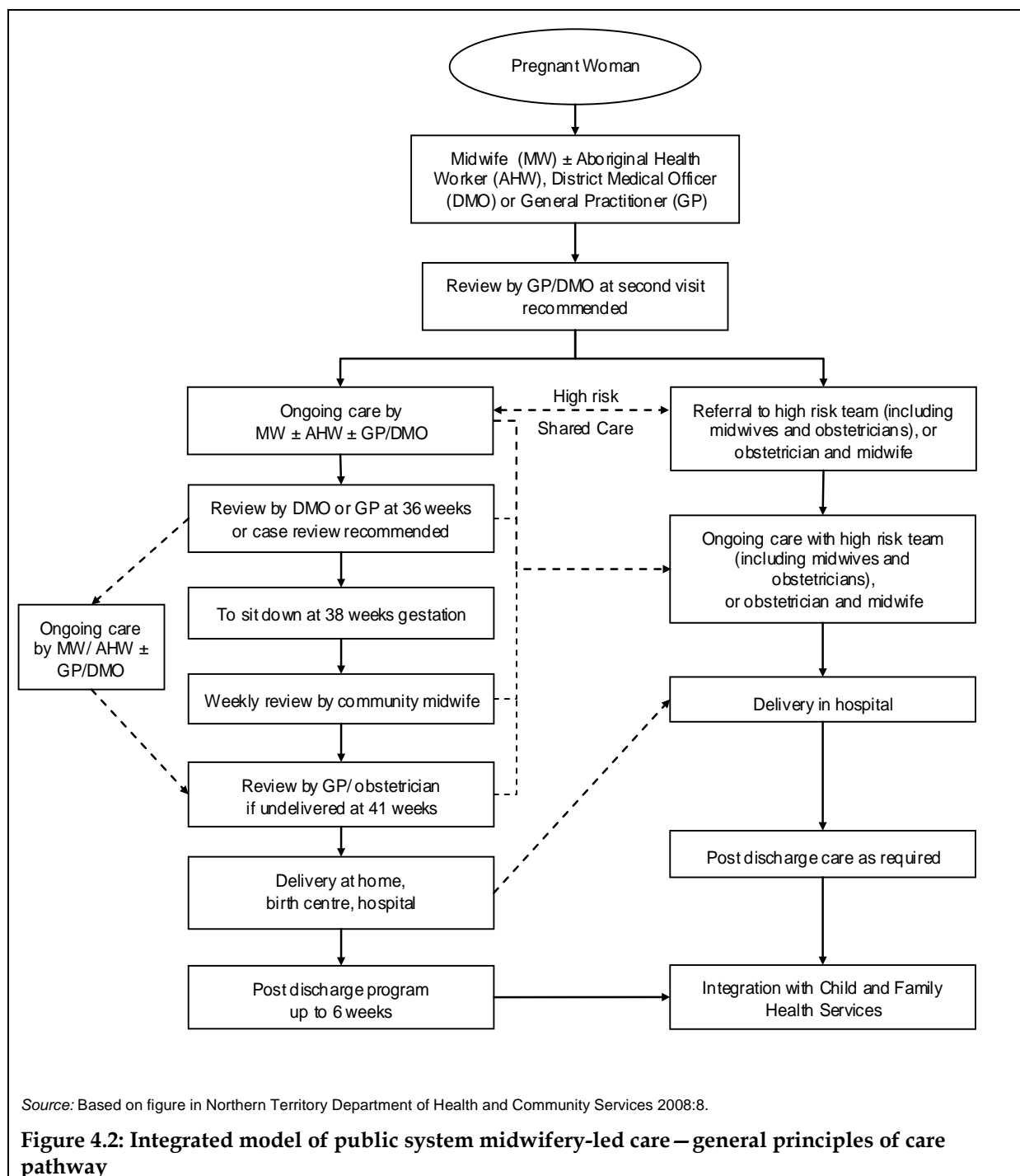
Following a review of maternity services in the Northern Territory in 2007, the Northern Territory Department of Health and Community Services proposed the development of an 'Integrated Maternity Services Model' (Banscott Health Consulting 2007; Northern Territory Department of Health and Community Services 2008). This framework for how maternity services should be delivered in the Territory has not been finalised. It provides general principles for how continuity of care should be provided regardless of a woman's risk category, although there is no indication of relational continuity within the pathways (Northern Territory Department of Health and Community Services 2008). Group midwifery practices are recommended as a model within a multidisciplinary approach to maternity care. Other characteristics to be considered are similar to those identified in other jurisdictions: type and number of carers, continuity, location, and risk group. The proposed integrated system, as shown in Figure 4.2, has a number of potential pathways for women



receiving care and this may vary depending on the individual model the woman is in. The various models that fit into this pathway include:

- Aboriginal maternity care
- caseload midwifery care (Midwifery Group Practice)
- GP shared care (midwives and GPs)
- hospital antenatal clinics (traditional model)
- private obstetric care
- remote area midwifery.

Within each of these models, there are variations as to the risk groups, location of care and types of care providers.



## National

There are a number of national documents relevant to understanding and defining maternity models of care in Australia. None dictate or define what models of care exist in Australia but, similar to the jurisdictional level, they do provide a framework to guide delivery of different models. Central to this role of 'guidance' is the framework for *Primary maternity services in Australia* (Australian Health Ministers' Advisory Council 2008). Prepared by NSW Health on behalf of the Maternity Services Inter-jurisdictional Committee, this document presents a

national framework for the provision of primary maternity services. It does not define models of care, but acknowledges that 'primary maternity services can be organised in many different and varied models of care to suit the needs of individual communities and there is no single ideal model' (Australian Health Ministers' Advisory Council 2008:4). The framework emphasises the importance of continuity of care across the continuum of pregnancy, birth and the early postnatal period; collaboration between care providers; services targeted to special groups; location of care; and choice of models. The lack of a consistent nomenclature and definitions for models of care is identified in the framework. Various examples of models of care are presented in the framework document and it is clearly shown that models that share the same name (for example, caseload models) have differing characteristics relating to the risk groups, number and type of carers, level of continuity and location of care.

The guideline *National guidance on collaborative maternity care* reiterates many of the points made in the abovementioned framework (National Health and Medical Research Council 2010). Models of care are not defined in this guideline and it is acknowledged that models vary based on local context and requirements. Many examples of different models of care are provided to demonstrate different components of collaboration between maternity care providers. Differences in types of providers, location of care, target groups and level of continuity are again highlighted. The guideline aims to demonstrate that, regardless of the differences among and within models of care, the principles of collaboration can still underpin the care provided.

Building on similar documents developed by some of the jurisdictions, the *National maternity services capability framework* provides a nationally consistent structure for guiding the development of maternity services based on minimum criteria for levels of service provision (DoHA 2012). Although this report does not define models of care, it does provide guidance to ensure that maternity services are women-centred, safe and appropriate.

The work of the Maternity Services Review and the recommendations that contributed to the NMSR were discussed in the previous chapter. This work highlighted the lack of consistent definitions for models of maternity care and gave examples of the broad categories of models currently in use around the country.

## **Research and other literature**

With the changes in maternity care over recent decades and an increase in the types of models of care, there has been a corresponding increase in the volume of research evaluating different models. Reviewing studies that evaluate models of care has enabled the characteristics that differentiate different models to be identified. While the literature provides extensive evidence to define the different characteristics of models of care, it does not examine which characteristics are more important than others or which have a greater influence on outcomes. That is also not the purpose of this literature review. A majority of the published literature concentrated on midwifery-led or continuity of care models and compared those with 'traditional' fragmented maternity care where care is delivered by a variety of unrelated providers across the maternal pathway.

### **Midwifery continuity of care models**

Midwifery continuity of care models feature heavily in the research literature. The terms 'midwifery continuity of care' or 'midwife-led care' are used to describe a range of models that involve midwives as primary carers (Homer et al. 2008a). Models that come under this

broad category include team midwifery and one-to-one or caseload midwifery (Hattem et al. 2008; Homer et al. 2008a). There are substantial differences between these two types of midwifery-led models; however, the commonality is that care is provided by known midwives throughout the 'antenatal, labour and birth, and postnatal periods' (Homer et al. 2008a:5).

In deciding what made up midwifery-led care, the authors of the last Cochrane Review included only studies where midwives were the lead carer for the continuum of care, from initial booking to the postnatal period (Hattem et al. 2008). The studies reviewed differed in the numbers of primary caregivers (team models with up to 8 midwives versus caseload models with a primary and backup midwife), where care was provided, and the types of women included in the model (some were 'low risk' models, others had various risk groups). The review also noted that some models included routine medical visits and had different levels of continuity. The subgroup analysis conducted as part of the review identified a number of characteristics that may have affected outcomes: the number of carers (team or one-to-one caseload), variation in risk status, and variation in practice setting. Discussions with Professor Jane Sandall, one of the review team currently updating the Cochrane Review, indicated that the revision may include other characteristics in the subgroup analysis, including the size of the teams. The variations identified in the Cochrane Review show that models that share the same name, such as 'team midwifery' or 'midwifery continuity of care', have variations in their configuration that impact on outcomes for mothers and babies. This variation was also identified by Homer, stating that 'in some settings in Australia, teams are now made up of 20 or more midwives' (Homer 2006:81). Walsh and Devane's (2012) metasynthesis of midwife-led care also suggests that the scale of teams and midwifery-led units had an impact on outcomes and women's experiences.

Other studies published since 2000 involving caseload or team midwifery models that were reviewed for this paper also showed variations in characteristics, despite the sharing of model names. Table 4.1 provides a summary of these variations between models in practice. Other characteristics that were not included in the table were the inclusion of routine medical appointments and length of routine postnatal care, which also varied between models.

Waldenström and Turnbull (1998) completed a systematic review of randomised controlled trials involving continuity of midwifery care in 1998. Their results also showed that there were variations in team size (from 4 to 10), routine medical visits, location of care and level of continuity (not all models included postnatal care by team midwives).

While many hospitals include team midwifery care and caseload or group practice models of care, the literature indicates that there is more to defining these models than solely by name or even by a generalised definition.

**Table 4.1: Midwifery continuity of care models – caseload and team models, examples of studies published since 2000**

Study	Model type	Number of carers	Risk status	Location of care	Level of continuity	Other
Tracy & Hartz 2006	Caseload	1 (primary with backup)	Low risk	A/N*: clinic Intra*: hospital P/N*: home	Full continuity—primary or backup midwife throughout	Caseload of 40 women per year Birth may be at Ryde (standalone midwifery unit) or tertiary hospital
Tracy et al. 2011	Caseload	1 (primary with backup)	All risk	A/N: various Intra: hospital or home P/N: home	Full continuity—primary or backup midwife throughout	Results of study still pending
Williams et al. 2010	Caseload	1 (primary with backup)	Low risk	A/N: not stated Intra: hospital P/N: home	Full continuity—primary or backup midwife throughout	Caseload of 40 women per year
Kelly et al. 2005	Partnership caseload	2 (caseload shared between 2 midwives)	Low risk	A/N: 'community' Intra: hospital P/N: home	Continuity of care by 2 known carers throughout	Not stated whether community was in clinics or home
Nixon et al. 2003	Caseload	1	All risk	A/N: community clinic or home Intra: hospital, birth centre or home P/N: community clinic or home	Full continuity	Women from a geographic area with known disadvantaged groups
Walker et al. 2004	Teams	8 per team (3 teams)	2 teams all risk 1 team low risk	A/N: hospital clinic and home Intra: hospital or birth centre P/N: hospital and home	Continuity of care by team not 1 carer	The low risk team birthed women in the birth centre
Waldenström et al. 2001	Team	8	Low risk	A/N: hospital clinic Intra: hospital P/N: hospital	Continuity of care by team not 1 carer—P/N care limited to follow-up visit in ward	

\* A/N = antenatal; Intra= intrapartum; P/N = postnatal

*(continued)*

**Table 4.1 (continued): Midwifery continuity of care models – caseload and team models, examples of studies published since 2000**

<b>Study</b>	<b>Model type</b>	<b>Number of carers</b>	<b>Risk status</b>	<b>Location of care</b>	<b>Level of continuity</b>	<b>Other</b>
Biró et al. 2000	Team	7	All risk	A/N: hospital clinic Intra: hospital P/N: hospital	Continuity of care by team not 1 carer—P/N care limited to visit in postnatal ward	
Begley et al. 2011	Teams	12 in one team 7 in second team	All risk	A/N: antenatal clinic or outreach clinic Intra: midwife-led unit in hospital P/N: hospital and home	Limited continuity—continuity of care within a team (up to 12)	A/N care could also be provided by GP—study in Ireland not Australia
Homer et al. 2001a and Homer et al 2001b	Teams	6	All risk	A/N: community centres Intra: hospital P/N: hospital or home	Continuity within a team of 6 across the continuum	30 women per month per team

## **Shared care**

As with midwifery-led care, there are many variations in how shared maternity care is provided. It is broadly defined as a model where some or all antenatal and postnatal care is provided by professionals in the community, and intrapartum care is provided as a public patient by staff in a public hospital (Brown et al. 1999; Hatem et al. 2008). The variations in how the model is provided in practice relate to who is providing care in the community, the level of continuity of care and the number of providers (Victorian Perinatal Data Collection Unit 1999). According to the literature reviewed, one of the most common models of shared care, particularly in non-metropolitan regions, is GP shared care, where antenatal care is provided by a GP in the community and intrapartum care is provided in the local public hospital with hospital midwives, often in collaboration with the community GP or a hospital obstetrician (Nicolson et al. 2005; Sutherland 2009). In rural settings in particular, continuity of care is provided by the family GP, which may begin before pregnancy and extend beyond the postnatal period.

The WUDWAW report in Victoria (Victorian Perinatal Data Collection Unit 1999) identified four variations in how shared care was delivered, and a separate review of shared care in Victoria by La Trobe University found at least 14 variations of shared care models. These different models were then grouped into three broad categories based on location of antenatal care (Brown et al. 1999). The models differed within each category by the type of antenatal care provider – GP, obstetrician, midwife or combination – and by the staff organisation for the intrapartum episode. The policy statement of The Royal Australian and New Zealand College of Obstetricians and Gynaecologists on shared care identifies an even wider range of providers, including the Royal Flying Doctor Service and the Aboriginal Medical Service (RANZCOG 2009b). The La Trobe University survey also determined that there was wide variation in risk stratification of women able to participate in various shared care models, with some excluding women with any complication and others including women with any risk factors.

Continuity can be defined in three different dimensions: informational, longitudinal and interpersonal or relational continuity (Sandall et al. 2008; Saultz 2003). Primary maternity care with either a GP or a midwife (or to some extent a small team) can be considered as relational and longitudinal continuity. GP shared care, in particular, can offer both of these types of continuity if the GP is also the family doctor. There has been some criticism in the literature that informational continuity may not be as successful in shared care models and that the presence of a hand-held record is important to ensure informational continuity between the community and hospital providers (Jackson et al. 2000; Nicolson et al. 2005).

## **‘Traditional’ maternity care**

In many of the studies reviewed, ‘other’ models of care were often pooled together as a control group to compare with the intervention group (usually a type of midwifery-led model). These ‘other’ models were also considered to be ‘standard’ or ‘traditional’ models of public hospital maternity care (Tracy et al. 2011). But there were variations in what this involved; in all studies reviewed, there was a lower level of continuity of care and carer in these models. This was due to different care provider personnel for the antenatal, intrapartum and postnatal periods. Antenatal care could be provided by midwives and doctors in hospital antenatal clinics or in the community, and intrapartum care provided by rostered staff in the hospital including midwives, obstetricians and registrars (Fereday et al. 2009; Hatem et al. 2008; Kelly et al. 2005; Tracy et al. 2011).

## Private maternity care

Private maternity care involving either an obstetrician or a GP obstetrician was also used as a comparison group in some of the studies (Hattem et al. 2008). According to the report *Australia's mothers and babies 2009* (Li et al. 2011), 33.5% of women who gave birth in hospitals were admitted as private patients and 30.1% of women were admitted to a private hospital. This model of care involves antenatal care being provided by a private obstetrician or GP and intrapartum care being provided by hospital midwives under the direction of the private doctor. Recent legislative changes by the Australian Government have resulted in this model also being extended to privately practising midwives (DoHA 2010). Despite the importance of this model of care (as demonstrated by the number of women using it), there is relatively little published literature examining its characteristics or outcomes.

## 4.3 Nomenclature for models of care

The review of the literature found no attempts in Australia or internationally to develop a standard nomenclature or taxonomy for maternity models of care. Table 4.2 is a list of major categories of models currently in use in Australia with the definition most currently agreed upon from the literature review. This alone is not a nomenclature. It serves as a general glossary or narrative description of categories of maternity care models rather than a way to accurately define and differentiate between individual models in practice. Location of care, number of carers, risk group and level of continuity do vary within each category.

**Table 4.2: Narrative description of categories of maternity models of care in Australia**

Category	Description
Private obstetric care	Antenatal care is provided by a private obstetrician (GP or specialist). Intrapartum care is provided in either a private or public hospital by the private obstetrician in collaboration with hospital midwives. Postnatal care is usually provided in the hospital by the private obstetrician and hospital midwives.
Private midwifery care	Antenatal care is provided by a private midwife or group of midwives. The midwife may have a collaborative arrangement in place to involve doctors in the event of complications. Home birth is an option provided by some carers but care providers are not currently covered by professional indemnity insurance. Postnatal care is provided in the hospital and at home by the private midwife, involving doctors when needed.
Shared care	Antenatal care is provided by a community maternity service provider (doctor and/or midwife) in collaboration with hospital doctors and midwives under an established agreement and can occur both in the community and in hospital outpatient clinics. Intrapartum and early postnatal care usually takes place in the hospital by hospital midwives and doctors often in conjunction with the community doctor or midwife (particularly in rural settings).
Combined care	Antenatal care is provided by a community maternity service provider (doctor and/or midwife) in the community. Intrapartum and early postnatal care is provided in the public hospital by hospital midwives and doctors.
Public hospital clinic care	Antenatal care is provided in hospital outpatient clinics by midwives and/or doctors. Intrapartum and postnatal care is provided in the hospital by midwives in collaboration with hospital doctors if required.
High risk public hospital care	Antenatal care is provided by maternity care providers (specialist obstetricians and/or maternal-fetal medicine specialists in collaboration with midwives) with an interest in high risk maternity care in a public hospital. Intrapartum and postnatal care is provided by hospital doctors and midwives.

(continued)



**Table 4.2 (continued): Narrative description of categories of maternity models of care in Australia**

Category	Description
Team midwifery care	Antenatal, intrapartum and postnatal care is provided by a small team of midwives (size varies but usually 6 to 8) with collaborative arrangements in place to involve doctors in the event of complications. Intrapartum care is usually provided in a hospital or birth centre.
Caseload midwifery care	Antenatal, intrapartum and postnatal care is provided by a known primary midwife with a secondary backup midwife providing cover and assistance with collaborative arrangements in place to involve doctors in the event of complications. Antenatal care and postnatal care is usually provided in the community (or home) with intrapartum care in a hospital, birth centre or home.
Remote area care	Antenatal and postnatal care is provided in remote communities by a remote area midwife or group of midwives sometimes in collaboration with a remote area nurse and/or doctor. Intrapartum and early postnatal care is provided in a city hospital (involving temporary relocation before labour) by hospital midwives and doctors.
No formal care	Not strictly a 'model' of care, but this category includes women who have received no formal antenatal care and present to hospital late in pregnancy or in labour.

*Note:* 'Doctors' include specialist obstetricians, GP obstetricians and obstetricians in training.

## 4.4 Gaps in the literature

Much of the literature available focused on models of care that involved variations in continuity of care provided mostly by midwives. There was very little available literature on obstetric models of care, such as private obstetric or GP shared care models (Dawson et al. 2000). There was also very little published material that examined rural or remote models of care specifically, but these were included in some of the jurisdictional documentation mentioned in Section 4.2.

Both published and grey literature reviewed for this paper provided evidence on the different characteristics that define maternity models of care. The literature does not examine which characteristics of models are either better than others or influence outcomes more than others. There is insufficient evidence in the primary research to make such qualifying statements or to undertake any degree of quantitative analysis of the evidence. The Cochrane Review of midwife-led versus other models of care provides some analysis of characteristics (such as level of continuity, risk and practice setting). Yet, it also acknowledges that the great heterogeneity between the models that were the subject of the published research makes it very difficult to analyse the different characteristics of the models. Models of care are a complex construct. The published research examines them as a whole product and compares complete models in a single setting (such as a midwifery continuity of care model versus a traditional public hospital clinic model) rather than analysing individual components. There is no evidence currently available to evaluate which characteristics of models have greater weight than others.

## 5 Discussion

The results of the literature review conducted in 2012, considered in the context of a classification system, show that while there are broad categories of models of care in Australia, there are substantial variations within those categories. Models of care are constantly evolving; a nomenclature that does not allow for these changes and varying characteristics will not be meaningful or useful. Models of care are a complex concept with many contributing components, all of which may impact on the quality and outcomes of maternity care experienced by women and their babies. A simple naming system will not capture the differences found between models that share the same name, even if common definitions are agreed.

### 5.1 Users and usage of a nomenclature

Before deciding what a proposed nomenclature should look like, it is important, firstly, to define who will use it and for what purpose (Gordon 1998; Whittaker & Breininger 2008). As mentioned in Chapter 1, the need for a standard nomenclature for maternity models of care was identified during the Maternity Services Review and was one of the actions recognised in the NMSP (Commonwealth of Australia 2009; AHMC 2011). The lack of a common naming system for models of care has contributed to the gap in capability for national reporting on maternity outcomes. Hence, one of the main uses of a nomenclature is for data gathering to enable analysis and reporting. This aligns with one of the functions of a comprehensive system identified by Zielstorff (1998) – to enable collection of structured data for administrative queries, quality assurance and research. By accurately classifying each model of care in a maternity service and recording that information in the PDC record for each woman, outcomes for mothers and babies can be compared between models on a national basis. This would contribute not only to providing an evidence-base for the range of models available in Australia, but also to developing new models of care and to ensuring that pregnant women in Australia receive the right care, in the right place by the right provider for the best outcome.

Potential users of the proposed classification system would include:

- clinicians
- community service providers
- epidemiologists
- health service administrators
- maternity consumers
- maternity service managers
- policy makers
- researchers
- state and territory data managers.

Not all these user groups would interact with the system in the same way or require the same level of detail. Managers in individual health services would use the system to identify and classify the models of care in their hospital or health service; clinicians would include the appropriate code on the data collection form for each woman under their care; data

managers would include this information in the PDC system; epidemiologists would analyse and report on the information and be able to compare outcomes from different models; policy makers could use the information to provide policy frameworks, funding and guidelines for different models of care; researchers could use the data gathered in the PDCs to accurately compare different models of care; and maternity consumers could identify the differences in available models and make informed decisions based on accurate data.

## 5.2 Characteristics of a nomenclature

For a classification tool to provide these functions, Zielstorff (1998) suggests the following characteristics of a successful system:

- it should be hierarchical
- terms should have unique identifiers for coding
- domain completeness and granularity are essential
- terms should be clear and not redundant
- it should contain agreed definitions.

The terms used in a nomenclature and classification system need to be descriptive enough to be understood, but also unique (Whittaker & Breining 2008). It is clear from the literature review that a simple descriptive naming system, such as detailed in Table 4.2 and as used in the NMSP, the WUDWAW report and the report of the Australian Medical Workforce Advisory Committee, are neither unique nor descriptive enough to be able to accurately classify models of care for all the purposes defined (AMWAC 2004; AHMC 2011; Victorian Perinatal Data Collection Unit 1999).

## 5.3 Unique characteristics of maternity models of care

The literature review identified that there are substantial variations between models of care that share a common name. The Cochrane Review of midwifery-led versus other models of care examined some of these variations in the subgroup analysis (Hatem et al. 2008). The attributes that help differentiate one model of care from another can be grouped into three broad domains with the following characteristics:

- care provided in the model
- carers working in the model
- women cared for in the model.

### Women

Although every woman's pregnancy is unique and women's pathways through maternity care can also differ (even in the same model), models of care are designed for particular groups of women. Based on the literature review, the two main characteristics about the women in a model of care that differentiate between models are risk category and target group.

## Risk category

### Box 1

Pregnancy and childbirth are not diseases and it is appropriate that where possible they should be considered natural and normal to human existence and managed accordingly. This has, however, to be balanced against the possible risks. (Agustsson 2006:106)

While pregnancy and childbirth in Australia are as safe as they have ever been (in regards to obstetric outcomes), and comparable with that in other developed nations in the Western world, the focus and attention on risk in maternity care has never been greater (Edwards & Murphy-Lawless 2006). Some authors attribute this to the rise in the technology-based 'biomedical model' of maternity care (Bryers 2010; Edwards & Murphy-Lawless 2006; Symon 2006; Walsh D. 2006).

According to Symon (2006:4), 'risk in the context of maternity care is an often contentious subject, with risk being used as a label that denotes suitability for particular models of care'. When developing a model of care, one parameter that defines who may use the model is risk status (risk of complications). Many of the studies reviewed for this paper identified the risk category of the women included in the model as either being 'low' or 'normal', 'mixed', or 'high' (Begley et al. 2011; Biró et al. 2000; Hatem et al. 2008; Homer et al. 2002; Hundley et al. 1997; Kelly et al. 2005; Nixon et al. 2003; Tracy et al. 2011; Waldenström et al. 2001; Williams et al. 2010). Women's risk status is usually determined via a 'triage' process at a 'booking appointment' before the start of antenatal care and is based on previous medical and obstetric history, assessment of her psychosocial situation and any current pregnancy complications (Kennedy 2006; Symon 2006). Hospitals use either an internal policy or guideline to assess risk status or an externally developed guideline such as those developed by the Australian College of Midwives or The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (Australian College of Midwives 2008; RANZCOG 2009a).

If outcomes from different models of care are to be compared using this nomenclature, it is important that women from similar groups are compared; this includes risk status. Although the subgroup analysis from the Cochrane Review did not 'show strong evidence of any difference in treatment effects' between women of low risk and mixed risk groups, risk status has been an important factor when investigating the outcomes of homebirths compared with other models of care (Jackson et al. 2012). The Cochrane Review was examining only midwifery-led versus other models (the subgroup analysis was within the midwifery-led models). Risk status (for example, obstetric/psychosocial) may be an important factor when analysing outcomes from within other models of care, such as shared care.

## Target group

Closely related to the issue of risk status is whether models of care are designed for or restricted to certain target groups of women who share particular characteristics. These target groups may be focused on commonalities of culture or ethnicity (for example, models for Aboriginal and Torres Strait Islander women), obstetric or medical conditions (models for diabetes, next birth after caesarean section), social circumstances (models for young mothers or refugees), or other vulnerable groups (models for victims of domestic violence or socioeconomic disadvantage). Differentiating whether a model of care is for a particular

target group will allow analysis of similar models rather than comparing models that may have completely different groups of women with different outcomes.

While perinatal and maternal outcomes in Australia are considered to be among the best in the world, this is not true for all sectors of the population, particularly for those in rural and remote communities and for Aboriginal and Torres Strait Islander women (AHMC 2011).

Some examples of models of care provided in the literature reviewed were targeted at some of the aforementioned groups: Royal Hobart Hospital 'Young Mum's antenatal clinic' (Giannaros 2012), Mater Mothers' Hospital model for Refugee Maternity Care (Correa-Velez & Ryan 2012), the Victorian model for obese women (Nagle et al. 2011), and the Family Anangu Bibi Birthing Program in South Australia for Aboriginal women (Homer et al. 2008c). These are just a few examples of targeted models of care for specific groups of women. While most of these examples were models of midwifery continuity of care, there were distinct differences in how the models were operated. One of the distinguishing features was the target group.

## **Carers**

The second group of characteristics that differentiate models of care are those relating to the carer. The literature review identified many variations between different models in the professional affiliation of carers in a model, the number of carers and the industrial awards and rostering of the carers working in a model.

### **Professional affiliation of carers**

In some models of care, it is obvious whom the lead carer is within a model – team midwifery care, for example. However, some categories of maternity models of care could have a range of professionals take the role of lead or primary carer: shared care models, public hospital clinic models, private care models, or combined care models. In these cases, the type of model is not enough to identify what are the professional affiliation of the carers involved and this makes comparing these models difficult.

The La Trobe review of shared obstetric care (Brown et al. 1999) and the WUDWAW report (Victorian Perinatal Data Collection Unit 1999) both identified differences in the way shared care models were structured. In some models, a GP was the lead carer; in others, a consultant obstetrician; and in yet some others, the role was shared between a medical practitioner and a midwife. In all cases, the models were referred to as 'shared care' but the professional affiliation differed in each. The RANZCOG also identifies different professions that are involved in shared care models in its policy statement on shared care (RANZCOG 2009b).

The professional affiliation of the carers involved in a model of care can influence how that model is structured and the philosophy of care that underpins the care provided (Hattem et al. 2008).

### **Number of carers**

The number of carers is particularly important when examining continuity of care(r) and differentiating between models identified as 'teams'. The literature review revealed that there are substantial differences in the number of carers who may be involved in a 'team' model of care, with some models having as few as 4 and others as many as 20 (Hattem et al. 2008; Homer et al. 2008a). Some authors also acknowledged that in 'traditional' hospital models of care some women may see as many as 32 different carers (Victorian Department of

Health 2010). By identifying how many different carers routinely participate in a model of care, it may be possible to evaluate the impact on the care provided to women, and the difference between continuity of care and continuity of carer. It is difficult to see how a team of 16 midwives could provide the same level of continuity as a team of 4 and yet they could both be called a team midwifery model of care under a standard naming system. The size of the team in a model will be one of the subgroup analyses conducted in the update to the Cochrane Review of models of care.

## **Industrial awards and rostering**

Some of the most recently developed models of care, such as midwifery one-to-one or 'caseload' models, have required a rethink about the way staff are organised and remunerated (Fereday & Oster 2010; Homer et al. 2008a; Passant et al. 2003). Traditionally, midwives have been organised on a roster basis, often rotating through different shifts. The move to one-to-one and small team models has meant that midwives are expected to be on call for the women under their care to ensure true continuity of care. Traditional industrial arrangements are not appropriate to accommodate the new work practices.

The terms 'caseload' or 'group practice' are often used to identify models that work in this way, but reliance on these names may not identify models with the same attributes. The terms 'group practice' and 'caseload' originated in England among a group of independent midwives in the 1990s. These midwives organised themselves into a new collaborative model of care and used terminology already familiar to those working in the National Health Service with GPs working in 'group practices' (Homer et al. 2008a). Including this characteristic to differentiate between models of care means less reliance needs to be put on the names of models; it can assist in identifying models that offer continuity of carer.

## **Care**

The final group of characteristics that differentiate between different models of care are aspects of the care itself: level of continuity, location of care, and mode of antenatal and postnatal care delivery (individual or group sessions).

## **Continuity**

Much has been written in the literature about the benefits of continuity of care and carer (ACT Health n.d.(b); Anonymous 2011; Davey et al. 2005; Farquhar et al. 2000; Fenwick 1998; Fereday et al. 2009; Foureur & Sandall 2008; Freeman 2006; Green et al. 2000; Haggerty et al. 2003; Hatem et al. 2008; Homer 2006; Homer et al. 2008b; Homer, Davis et al. 2001a; Homer et al. 2002; Homer, Matha et al. 2001b; Hundley et al. 1995; Hundley et al. 1997; Johnson et al. 2003; Leap et al. 2010; McCourt & Pearce 2000; Nagle et al. 2011; NSW Health 2012; Queensland Health 2012; Rowley (Foureur) et al. 1995; Sandall 1995, 1997; Sandall et al. 2008; Saultz 2003; Saultz & Lochner 2005; Waldenström 1998; Waldenström & Turnbull 1998; Williams et al. 2010).

Benefits include greater satisfaction for women and clinicians, improved outcomes for women and babies and reduced costs for hospital services. There is some debate in the literature whether the benefits of continuity are due to continuity of the carer or continuity of care (Freeman 2006). The level of continuity varies between different models of care and also within categories of models. In some models, such as some team midwifery models of care, continuity of care is provided by a small group of midwives who share the same philosophy and work practices, with the same group of midwives seen through the antenatal,

intrapartum and postnatal periods (Hattem et al. 2008; Homer et al. 2008a). In some team midwifery models, continuity may be provided only in the antenatal and postnatal periods or only in the antenatal period. Similarly, shared care models may offer continuity of carer in the antenatal period but not in the intrapartum or postnatal periods. There are a multitude of variations and these cannot be accounted for by the name or category of the model alone. The level of continuity can impact on outcomes for mothers and babies, both in a physical and a psychosocial sense. If differences in continuity across the stages of pregnancy, labour and birth and the postnatal period cannot be identified, comparisons between models will not be accurate.

## **Location**

One of the most significant variations within and between categories of models of care is the location of care in the three stages of maternity care. The literature review highlighted the variations within the same type of model with antenatal, intrapartum and postnatal care being provided in the community (including the home), birth centres (freestanding and hospital) and in public and private hospitals. The location of care is increasingly thought to influence a woman's experience of her care and her progress in labour, and differences have been highlighted in the Cochrane Review and the Birthplace in England study (Birthplace in England Collaborative Group 2011; Hattem et al. 2008). Studies specifically examining the effects of place of birth have either begun or are starting in the United Kingdom and Australia (Birthplace in England Collaborative Group 2011; University of Technology Sydney 2011).

If outcomes are affected by location of care, this cannot be identified by a simple nomenclature when models of the same name have variations in where care is provided. This is particularly relevant when considering not only the physical location (such as the birth centre, home or hospital) but also the geographic location when it relates to rural and remote models of care. Over 50% of Aboriginal and Torres Strait Islander birthing women live in outer regional and remote areas, and outcomes for these women and their babies are generally poorer than for those women in major cities (Kildea et al. 2010; Li et al. 2011). It is important to identify not just the location of the birth (as for some remote women this may be a metropolitan hospital) but also the location of where the woman's antenatal and postnatal care is provided. Addressing the gap between the health outcomes of non-Indigenous and Aboriginal and Torres Strait Islander people is a focus of several actions in the NMSP as well as of the overall Five Year Vision (AHMC 2011).

## **Individual or group care (antenatal and postnatal)**

In the same way that location of care has been shown to influence outcomes, the way care is delivered, either as individual one-on-one sessions or as group sessions, has also been shown to have some effect (Ickovics et al. 2003; Palmer et al. 2010; Queensland Health 2012). For some vulnerable groups of women, a model of care using group antenatal care (in some cases, using a proprietary model called CenteringPregnancy® (Centering Healthcare Institute 2011) has been shown to improve outcomes for mothers and babies (Ickovics et al. 2003; Palmer et al. 2010).

Identifying how care is delivered will allow models to be differentiated that may be part of the same broad category, such as midwifery caseload models.

## 5.4 Framework for classifying models of care

The results of the literature review and the discussion of the findings established that a simple naming system or nomenclature would not be enough to differentiate between models of maternity care and enable meaningful analysis and reporting. A more comprehensive framework, resulting in a classification system based on the characteristics identified in this chapter, would allow identification, data collection, analysis and reporting of models of maternity care and reveal any differences in outcomes for mothers and babies.

Based on the literature review and an examination of the variables of models of care that contribute to different outcomes for mothers and babies, a draft Model of Care framework was developed as the basis of a system for classifying models of maternity care. Table 5.1 provides details of the framework, which is based around the three domains of **Women**, **Carer** and **Care**. A list of the primary research studies reviewed that contributed to evidence for including each of the data elements is at Appendix D. Further grey literature and secondary research were also considered when developing the framework.

The framework provides a way to identify common elements that exist, based on the literature and existing models of care, and will be used to develop a more descriptive taxonomy. The framework can be used at a macro level to enable health facilities to describe the models of care they provide within their service. The framework and resulting classification system are meant to be applied to the broad models of care available, not to individual women accessing the service. The framework would be used to classify models of care in each maternity service with a resulting 'Model of Care' data item that would be applied to each woman's record.

As already stated, a classification system requires a high degree of complexity in order to effectively identify the core concepts and finer differences of the range of models of care for maternity services. The resulting classification system for models of care will be applied in jurisdictional data collections and will ensure that national data are consistent.

### Dimensions and data elements

The framework features three main dimensions (Women, Carers, Care), each with a number of data elements and sample data values that describe the model of care under scrutiny.

The **Women** dimension is designed to capture information about the women who would *typically* be accepted into the particular model of care. Essentially, it is about the type of women, for example, their level of risk. As the literature review has shown, some models of care are specifically designed to cater for women with particular complexities pertaining to their medical, obstetric or psychosocial health. Some models may have limits as to the type of complexity allowed in each model. Other models cater for all women regardless of level of risk or complexity.

It is important to recognise that this dimension in the framework, and ultimate taxonomy, relates to the design of the model as a whole and not to an individual woman who is using the particular model of care being described. Some women within a model of care may develop risk factors during the pregnancy that would have precluded them from the model (if it has been a 'low risk' model); this does not mean that the model is for 'all risk' women.

The **Carer** dimension is about describing the care providers within the model. Elements include professional affiliation of carers, continuity of primary carer, and number of care providers.



The **Care** dimension describes the work practices and organisational policy directing the care providers. This dimension focuses at a service provider level. Elements include the way care providers are organised, the planned location of care in the different stages, and timing of some elements of care.

## **Data values**

Sample data values are shown in grey in Table 5.1 in order to illustrate how the data element might work. These are examples only and will require further development and revision during the next stage of the project.

There are some important points to note:

- This framework is the basis of a system for classifying models of care rather than describing an individual woman's pregnancy. Not all women within a defined model of care will experience exactly the same attributes of the model in the same way.
- The framework will be used to develop a DSS to classify models of care, resulting in a tool or algorithm applied by each maternity service to identify and classify the different models of care being used within that service. Table 5.2 provides some examples of how this data item 'Model of Care' could be applied.

## **Limitations of the framework**

The proposed Model of Care framework encompasses many variables of maternity care models that not only define models but may also influence outcomes. Some characteristics of maternity care that also impact on women's experiences and outcomes cannot be measured or easily defined within this framework. These include the philosophy of 'woman-centred care', the influence of institutional policies or procedures, and carer's values.

**Table 5.1: Framework for classifying models of maternity care**

<b>Dimension</b>	<b>Data element</b>	<b>Purpose of element</b>	<b>Sample data values</b>
Women	Type of risk	Type of risk for women usually admitted to the model. For example, risk equates with an additional level of complexity or medical/psychosocial/obstetric conditions that result in pregnancy no longer being 'normal' risk.	Normal Mixed/all risk High risk only
	Target group	Is the model designed for a specific group of women (for example, cultural group, vulnerable group, medical group)?	Diabetic clinic Vaginal Birth After Caesarean Aboriginal or Torres Strait Islander women and so on
Carers	Professional affiliation of lead/primary carer	Many models of care are defined by the professional who is the 'lead carer' also known as the 'maternity care coordinator', 'primary carer' (for example, midwifery-led models, GP-led models). The prospective data values also include whether there is more than one lead carer.	Midwife Obstetrician GP obstetrician GP Maternal-fetal medicine specialist Aboriginal health worker Shared care: GP + midwife Shared care: midwife + Aboriginal health worker
	Organisation of maternity care providers	Documented structure of the core group of maternity care professionals who are in contact with the woman. For example, a Midwifery Group Practice offering a caseload model may have a self-managed caseload but a team midwifery model may have a rostered organisation.	Rostered Self-managed (that is, has a capped caseload) Self-managed without a capped caseload
	Size of caseload	If the model has a capped caseload, what is the usual capped number of women per annum per carer?	<30 30–40 40–50 >50

*(continued)*

**Table 5.1 (continued): Framework for classifying models of maternity care**

<b>Dimension</b>	<b>Data element</b>	<b>Purpose of element</b>	<b>Sample data values</b>
Carers (continued)	Continuity of lead carer	This element describes the extent of continuity of the lead or primary carer across the different stages of maternity care.  For example, a midwife in private practice might have continuity of lead carer throughout antenatal and postpartum, or the whole duration of maternity care.	Whole duration of maternity care Antenatal period Antenatal and intrapartum Antenatal and postpartum No continuity
	Professional affiliation of other routine collaborative carer(s)	This is designed to capture the scope of other recognised and named professional roles who routinely collaborate with the lead care provider in the model of care. These professionals have a designated role in the model as opposed to being referred to on an ad hoc basis as required for some women.	Midwife Doctor (includes GP or specialist obstetrician) Nurse Aboriginal health worker Medical specialist (other than obstetric) Perinatal mental health worker Other allied health practitioner Nil
	Number of maternity care providers	This refers to the number of different maternity care providers who would <b>routinely</b> see the women in this model throughout the three stages of maternity care.  For example, a particular model of care there may be 6 people in the group practice, but only 2 midwives actually see the woman, so the number would be 2.	1–2 3–6 >6 Not defined

*(continued)*

**Table 5.1 (continued): Framework for classifying models of maternity care**

<b>Dimension</b>	<b>Data element</b>	<b>Purpose of element</b>	<b>Sample data values</b>
Care	Continuity of location of care	This element describes the extent of continuity of the context of the model. Does the model provide continuity across locations of care? For example, a model may be able to provide only antenatal care in a remote community, with all women being transported to an urban hospital for intrapartum care by a different team of providers.	All care provided in one area Intrapartum care >50 km from antenatal Intrapartum care >150 km from antenatal Intrapartum care >500 km from antenatal (values to be determined)
	Continuity of information	This element describes whether there is informational continuity regardless of the continuity of care providers or location. For example, women in this model of care are given a hand-held pregnancy record for the duration of care.	No continuity of information Single paper hand-held record for all care Single shared electronic record
	Main planned location of antenatal care (most care is provided here)	This element describes the scope of location that is offered within this model of care. Some models of care offer multiple options. For example, a caseload midwifery model might offer antenatal care at a hospital clinic or home.	Hospital clinic Clinicians' rooms Community facility Aboriginal Community Controlled Health Organisation Home Mixed
	Main planned location of intrapartum care (most care is provided here)	This element describes the scope of location that is offered within this model of care. Some models of care offer multiple options. For example, a team midwifery model may offer birth in a hospital or birth centre.	Home Birth centre—stand alone Birth centre—in hospital Hospital labour ward Other hospital area Aboriginal Community Controlled Health Organisation Varies depending on availability or choice
	Main planned location of postnatal care (most care is provided here)	This element describes the scope of location that is offered within this model of care. Some models of care offer multiple options. For example, a shared care model may offer postnatal care in hospital or home.	Only hospital care Hospital and home care Only home care Aboriginal Community Controlled Health Organisation Other

*(continued)*

**Table 5.1 (continued): Framework for classifying models of maternity care**

Dimension	Data element	Purpose of element	Sample data values
Care (continued)	Individual or group care	To identify whether the model of care offers antenatal and postnatal care in individual or group sessions. For example, a team midwifery model offering group antenatal care such as Centering Pregnancy®.	Individual one-to-one care Group session Mix
	Trimester of first clinical assessment	In which trimester is the first clinical appointment or assessment routinely conducted? This is not an administrative booking visit unless there is also a clinical assessment done.	First (0–12 weeks) Second (13–26 weeks) Third (27–40 weeks)
	Postnatal care end	At how many weeks after birth is <b>regular</b> postnatal care terminated? In the case of a single 6-week postnatal consultation with a GP/obstetrician, this does not mean 6 weeks.	At discharge <1 week 1–2 weeks 3–4 weeks 4–6 weeks >6 weeks Negotiable
	Geographic location of model	To describe at the broadest level the geographic location of the majority of care provision of this model. For example, if antenatal care is provided in a remote community but intrapartum care is in a metropolitan hospital, this would be a 'remote' location. This item acknowledges the origin of the model rather than the location of the birth.	Metropolitan Rural inner region Rural outer region Remote (values to be determined)

## Practical application of the Maternity Care Classification System

The Maternity Care Classification System (MaCCS) is developed by combining the MMC as presented in Table 4.2 with development of a Models of Care DSS based on the framework in Table 5.1.

A survey based on the new Models of Care DSS will be completed annually by each maternity service to define the characteristics of each maternity model of care offered there. Based on the characteristics of the model, an algorithm will produce an MMC that would then be assigned to that particular model at that maternity service. At each maternity service/institution/health authority, the MMC code generated by the survey is used in all clinical records and data collections that include information about maternity care within the hospital or health authority. For example at Hospital A:

- Caseload Team Avoca = C1
- Caseload Team Bennelong = C2
- Public midwifery clinic = P1
- Public medical clinic = P2
- GP shared care = G1.

MMC data elements can be incorporated into the Perinatal NMDS, jurisdictional data collections and other maternity-relevant data collections. The points in pregnancy at which the MMC and related data element(s) could be captured would be:

- first antenatal visit
- at term (37 completed weeks)
- onset of labour
- gestation at which the model changed (if applicable)
- reason for change from previous model (if applicable).

For example, the values for the Model of Care at first antenatal visit and at onset of labour come from the MMC codes assigned to the models at the institution. For example:

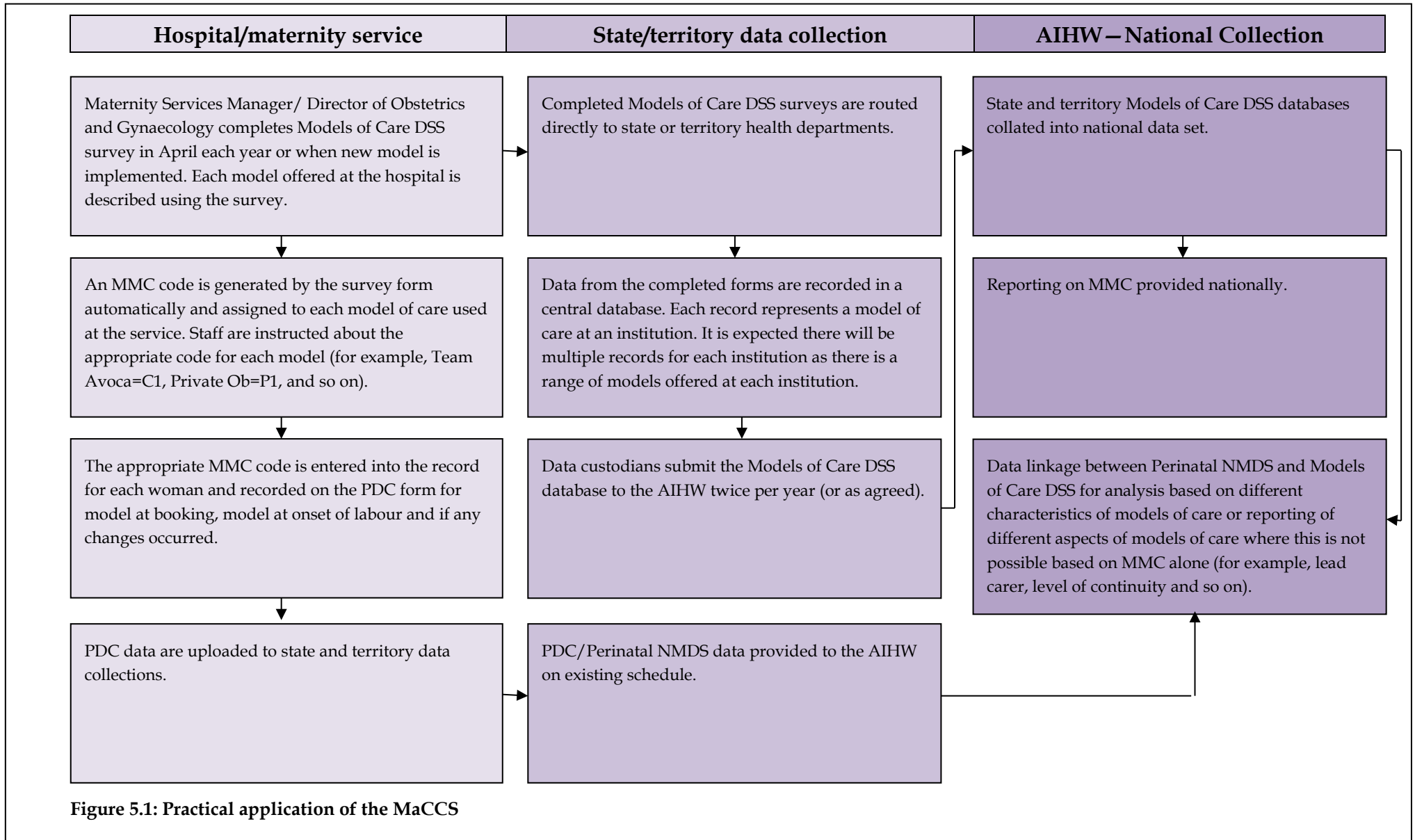
- A woman is assigned to Caseload Team Avoca at her first antenatal visit but during her pregnancy changes to the public medical clinic due to having a medical complication. This would be recorded on her PDC form as:
  1. Model of care at first visit: C1
  2. Model of care at onset of labour: P2
  3. Gestation model changed: 24
  4. Reason for change: medical.

Data about models of maternity care collected by states and territories can be analysed and reported in the following two ways:

- An annual audit of the range of models provided across the state can be reported using the MMC data submitted with the Models of Care DSS. This would give an overview of the models available to women using the broad descriptive terms used by consumers and maternity services such as 'GP shared care', 'Private obstetric care', and so on.
- Standardised data for the Perinatal NMDS and other maternity data collections will enable analysis relating to the individual characteristics of models of care. This could be completed at an institutional or jurisdictional level, or nationally, via data linkage of the Perinatal NMDS and the Models of Care DSS. This would allow analysis of outcomes for women and babies based on different characteristics of models, such as the level of

continuity, the lead care provider, the risk category of the model, and so on, and would be independent of the MMC.

Figure 5.1 illustrates how the MaCCS would be used at institutional, jurisdictional and national levels to define, label, record and analyse maternity models of care.





**Table 5.2: Example of applying the MaCCS in a PDC context**

Potential PDC element	Value
Model of care at first antenatal appointment	[MMC code determined by classification system]
Model of care at term (37+ weeks)	[MMC code determined by classification system]
Model of care at onset of labour	[MMC code determined by classification system]
Did the woman change her model of care during the episode of care?	Yes No
Timing of change	Antenatal Intrapartum Postpartum <i>or</i> Gestational age when changed
Reason for change	Woman's choice Complication of pregnancy or labour Other
Model of care after change	[MMC code determined by classification system]

## 6 Next steps

The Model of Care framework presented in Table 5.1 will be used as the basis for developing a DSS to be used in conjunction with the MMC from Table 4.2 for a classification system that will provide standardised categories of maternity models of care. This may later be developed into a NMDS, subject to jurisdictional support.

The categories of models identified in Table 4.2 form the MMC that provide a broad description of models and can provide the link between the data recorded for individual women and data recorded in the DSS about the model.

The next phase of the project will be a consultation phase to present the MaCCS to stakeholders and content experts to gain feedback and consensus on the framework structure, the MMC and proposed use.

The draft MaCCS should then be distributed for wider consultation on a national basis. The process successfully used by two other projects actioned from the NMSP – the National Capability Framework and the National Hand-held Pregnancy Record – involved face-to-face consultations in each jurisdiction with a range of stakeholders, which was organised by each jurisdiction's Health department. These meetings included clinicians, data managers, consumers, academics and policy advisors.

The NMoCWP will assist in incorporating or responding to feedback throughout the consultation process.

## 7 Conclusion

Models of care are complex often dynamic structures that have been developed over time to meet the changing needs of consumers, the greater society and the maternity workforce and to respond to an expanding maternity evidence base.

Names of models of care can have different meanings depending on the context and location of care. There has been no national work completed to date to develop a standard nomenclature or taxonomy for defining models of care. Results from numerous studies, combined with other published and non-published literature, demonstrate that there are a range of variables within models of care that not only differentiate between them but also have an impact on outcomes for mothers and babies. Capturing these variables within a structured classification system will enable data on models of maternity care and outcomes for women and babies to be collected, analysed and reported on a national basis.

While there are some things that contribute to models of care and women's maternity experiences that cannot be measured or defined – such as women-centred care, philosophy, organisational context and staff values – this literature review and paper has identified three distinct domains containing discrete data elements that *can* be used to define and classify Australian models of maternity care – **women**, **carer** and **care**.

# Appendix A: Contributors to this paper

## Nomenclature for Models of Care Working Party Membership

Fadwa Al-Yaman, Head, Social and Indigenous Group, Australian Institute of Health and Welfare, representing the Australian Institute of Health and Welfare

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Elizabeth Sullivan, Director National Perinatal Epidemiology and Statistics Unit (NPESU), representing the NPESU and Chair of the Nomenclature for Models of Care Working Party

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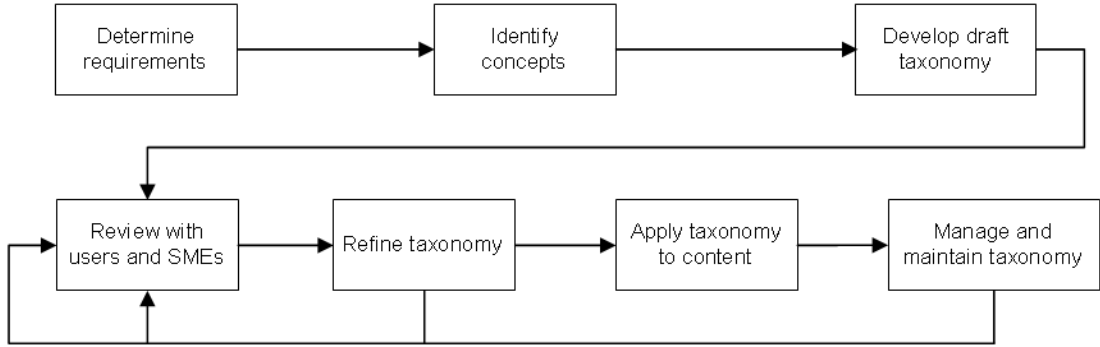
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# Appendix B: Development of taxonomies, nomenclatures and classification systems

Francois Bossier de Lacroix is credited with developing the first systematic classification system for disease in the mid-1700s. Since then, there has been ongoing development of classification systems and taxonomies in health and medicine to allow complex concepts to be recognised and communicated. Controlled vocabularies, taxonomies and classification systems are knowledge management tools that are used to organise complex content and to connect people with the information they need to use (Whittaker & Breininger 2008). Van Rees cites several authors from the e-business industry who refer to a taxonomy as a hierarchical structure with a ‘tree of choices’ that assist in classifying information (2003).

In her examination of the development of nomenclatures and classification systems in nursing, Gordon (1998) makes an important observation that ‘classification systems are designed for specific purposes to meet the needs of particular users’. The ICD is a good example of a classification system developed for a particular purpose, which has been adapted and updated over time to suit the needs of different user groups (Bowker & Star 1994). When developing a taxonomy or classification system, it is important to identify the users and uses for which the system is required. It is also important to understand that, for it to apply to a range of stakeholders, it will have some level of uncertainty and ambiguity if it is to remain flexible (Bowker & Star 1994; Whittaker & Breininger 2008). Whittaker and Breininger further recommend using commonly understood terminology that ‘should be descriptive enough to be meaningful and unique’ (2008:5).

Whittaker and Breininger developed a 7-step approach to developing a taxonomy, which is outlined in Figure B1.



Note: SME=subject matter expert

Source: Based on figure in Whittaker & Breininger 2008:3.

**Figure B1: Seven steps to developing a taxonomy**

A taxonomy uses hierarchical relationships, which distinguishes it from basic lists and other controlled vocabularies (Whittaker & Breininger 2008). It allows for ‘rolling up’ categories to allow comparisons at different levels (Zielstorff 1998). An example given by van Rees (2003) is based on the animal kingdom taxonomy. At the top level is Kingdom ‘animals’, below which, in descending order, is the Class ‘mammals’, then the Order ‘carnivores’, with other levels of Genus and Species below this. Using this hierarchical structure, one could compare two different species of dog at the most granular level or ‘roll up’ higher to examine the

Genus 'canis' or even further to the Order level. Each of these different levels enables the target animal species to be differentiated, based on common characteristics at different levels.

Two health-related classification systems provide the same hierarchical configuration, allowing a greater level of granularity than a simple list: the ICD-10-AM and the AR-DRG. In the case of ICD-10-AM, the top level is made up of the 22 chapters that are based on the site of the disease or condition (such as Diseases of the Nervous System), with some special chapters based on special groups (such as Pregnancy, Childbirth and the Puerperium) (National Centre for Classification in Health 2010). Within each chapter, are blocks that group similar diseases or conditions, and at this 3-character level comparisons can be made with the World Health Organization's ICD10. The Australian Modification (ICD-10-AM) has added another level of granularity to provide more detail at the 4- or 5-character level. For example, K40 is Inguinal hernia; K40.0 is Bilateral inguinal hernia, with obstruction, without gangrene; and K40.1 is Bilateral inguinal hernia, with gangrene.

As with ICD-10-AM, the AR-DRG classification system starts with a high level grouping, in this case the 23 Major Diagnostic Categories that have similarities with the ICD-10-AM chapters (DoHA 2008a). Each Major Diagnostic Category is then subdivided into groups of closely related diagnoses and procedures called 'adjacent DRGs'. These groups are first created by separating the groups into surgical, medical and other cases. Further differentiation is made based on the principal diagnosis or procedures. Finally, individual DRGs are created based on clinical and other factors that impact on resource use such as age, comorbidities or complications. This results in a hierarchical classification system that, like the ICD-10-AM, allows analysis at different levels, as well as sufficient granularity to differentiate between episodes of care based on clinical and resource homogeneity (Duckett 2000).

In examining the classification of nursing care, Zielstorff (1998) identified a list of some of the characteristics required for a system that enables structured data capture, analysis and reporting (such as would be required for models of care). The characteristics include:

- clinical utility
- combinatorial
- domain completeness
- granularity
- multiple axes
- non-ambiguity versus non-redundancy
- parsimony
- synonymy.

These characteristics are considered further in Chapter 5 in proposing a classification system for models of maternity care.

# Appendix C: Policies and reports concerning maternity models of care

**Table C1: Policies and reports concerning maternity models of care**

Origin	Policy name
New South Wales	<p>The NSW Framework for Maternity Services (NSW Health 2000)</p> <p>Guide to the Role Delineation of Health Services (NSW Health 2002)</p> <p>Models of maternity service provision across NSW: progressing implementation of the NSW Framework for Maternity Services (NSW Health 2003)</p> <p>First report on the Models of Care Project (NSW Health 2006)</p> <p>Second report on the Models of Care Project: workshops and seminars (NSW Health 2007)</p> <p>PD2010_045 Maternity—towards normal birth in NSW (NSW Health 2010)</p>
Victoria	<p>Review of shared obstetric care. Summary report (Brown et al. 1999)</p> <p>WUDWAW 'Who Usually Delivers Whom and Where' Report on Models of Antenatal Care (Victorian Perinatal Data Collection Unit 1999)</p> <p>Future directions for Victoria's maternity services (Victorian Department of Human Services 2004)</p> <p>Capability framework for Victorian maternity and newborn services (Victorian Department of Health 2010)</p> <p>Maternity services: Capacity (Victorian Auditor-General 2011)</p>
Queensland	<p>Changing Models of Care Framework (Queensland Health 2000)</p> <p>Rebirthing: report of the review of maternity services in Queensland (Hirst 2005)</p> <p>Modelling contemporary nursing and midwifery: a framework for shaping professional practice (Queensland Health 2008)</p> <p>Statewide Maternity and Neonatal Clinical Network Action Plan Nov 2009–Oct 2011 (Queensland Health 2010)</p> <p>Clinical Services Capability Framework for Public and Licensed Private Health Facilities v3.0 (Queensland Health 2011)</p> <p>Delivering continuity of midwifery care to Queensland women. A guide to implementation (Queensland Health 2012)</p>
Western Australia	<p>Improving maternity services: working together across Western Australia. A policy framework (Western Australian Department of Health 2007)</p> <p>Models of maternity care: a review of the evidence (Henderson et al. 2007)</p> <p>Evaluation of pregnancy outcomes and cost effectiveness of models of antenatal care and preferred setting for labour and birth care in women at low risk of pregnancy complications (Doherty et al.2008)</p>

*(continued)*



**Table C1 (continued): Policies and reports concerning maternity models of care**

Origin	Policy name
Western Australia ( <i>continued</i> )	<p>Maternal and Child Health Model of Care in the Aboriginal Community Controlled Health Sector 2011 (McHugh &amp; Hornbuckle 2011)</p> <p>Home birth policy and guidance for health professionals, health services and consumers (Western Australian Department of Health 2011a)</p> <p>Models of maternity care: updated evidence on outcomes and safety of planned home birth (Western Australian Department of Health 2011b)</p>
South Australia	<p>Policy for planned birth at home in South Australia (SA Health 2007)</p> <p>Country Health SA Maternity Services Steering Committee final report and recommendations (Country Health SA Maternity Services Steering Committee 2007)</p> <p>Standards for Maternity and Neonatal Services in South Australia 2010 (SA Health 2009)</p> <p>South Australian Implementation Plan and milestones summary for the Indigenous Early Childhood Development National Partnership 2009 (unpublished)</p>
Tasmania	<p>Tasmania's Health Plan—Clinical Services Plan May 2007 (Tasmanian Department of Health and Human Services 2007)</p> <p>WORKPLAN Element 2: Antenatal care, pre-pregnancy and teenage sexual and reproductive health (DHHS 2010)</p> <p>'Comprehensive list of models of midwifery care Royal Hobart Hospital' (unpublished work) (Giannaros 2012)</p>
Australian Capital Territory	<p>ACT Health Maternity Shared Care Guidelines (ACT Health 2008)</p> <p>Midwifery continuity of care brochure (ACT Health n.d.[b])</p>
Northern Territory	<p>Maternity services review in the Northern Territory (Banscott Health Consulting 2007)</p> <p>Developing an integrated maternity services model (Northern Territory Department of Health and Community Services 2008)</p>
National	<p>The specialist obstetrics and gynaecology workforce—an update 2003–2013 (AMWAC 2004)</p> <p>Improving maternity services in Australia: a discussion paper from the Australian Government (Commonwealth of Australia 2008)</p> <p>Primary maternity services in Australia (Australian Health Ministers' Advisory Council 2008)</p> <p>Improving maternity services in Australia: the report of the Maternity Services Review (Commonwealth of Australia 2009)</p> <p>A healthier future for all Australians: final report of the National Health and Hospitals Reform Commission June 2009 (National Health and Hospitals Reform Commission 2009)</p> <p>National Guidance on Collaborative Maternity Care (National Health and Medical Research Council 2010)</p> <p>The National Maternity Services Plan (AHMC 2011)</p> <p>National Maternity Services Capability Framework (DoHA 2012)</p>

# Appendix D: Primary research that supports elements of the Models of Care Framework

Table D1: Primary research that supports elements of the Models of Care Framework

Dimension	Data element	Reference
Women	Type of risk	<p>Begley C, Devane D, Clarke M, McCann C, Hughes P, Reilly M et al. 2011. Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. <i>BMC Pregnancy Childbirth</i> 11:85.</p> <p>Biró MA, Waldenström U &amp; Pannifex JH 2000. Team midwifery care in a tertiary level obstetric service: a randomized controlled trial. <i>Birth</i> 27:168–73.</p> <p>Biró MA, Waldenström U, Brown S &amp; Pannifex JH 2003. Satisfaction with team midwifery care for low- and high-risk women: a randomized controlled trial. <i>Birth</i> 30:1–10.</p> <p>Birthplace in England Collaborative Group 2011. Perinatal and maternal outcomes by planned place of birth for healthy women with low risk pregnancies: the Birthplace in England National Prospective Cohort Study. <i>BMJ</i> 343.</p> <p>Correa-Velez I &amp; Ryan J 2012. Developing a best practice model of refugee maternity care. <i>Women and Birth</i> 25:13–22.</p> <p>Dawson W, Brown S, Gunn J, McNair R &amp; Lumley J 2000. Sharing obstetric care: barriers to integrated systems of care. <i>The Australian and New Zealand Journal of Public Health</i> 24:401–6.</p> <p>Doherty D, Hornbuckle J, Hutchinson M, Henderson J, Montague G &amp; Newnham J 2008. Evaluation of pregnancy outcomes and cost effectiveness of models of antenatal care and preferred setting for labour and birth care in women at low risk of pregnancy complications. Perth: Western Australian Department of Health.</p> <p>Fleissig A, Kroll D &amp; McCarthy M 1996. Is community-led maternity care a feasible option for women assessed at low risk and those with complicated pregnancies? Results of a population based study in South Camden, London. <i>Journal of Midwifery</i> 12:191–7.</p> <p>Harvey S, Jarrell J, Brant R, Stainton C &amp; Rach D 1996. A randomised, controlled trial of nurse-midwifery care. <i>Birth: Issues in Perinatal Care and Education</i> 23:128–35.</p> <p>Hatem M, Sandall J, Devane D, Soltani H &amp; Gates S 2008. Midwife-led versus other models of care for childbearing women. <i>Cochrane Database of Systematic Reviews</i>:CD004667.</p> <p>Homer C, Davis G, Brodie P, Sheehan A, Barclay L, Wills J et al. 2001a. Collaboration in maternity care: a randomised controlled trial comparing community-based continuity of care with standard hospital care. <i>BJOG: An International Journal of Obstetrics and Gynaecology</i> 108:16–22.</p> <p>Homer C, Davis G, Cooke M &amp; Barclay L 2002. Women's experiences of continuity of midwifery care in a randomised controlled trial in Australia. <i>Midwifery</i> 18:102–12.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Women	Type of risk ( <i>continued</i> )	<p>Hundley VA, Cruickshank FM, Milne JM, Glazener CM, Lang GD, Turner M et al. 1995. Satisfaction and continuity of care: staff views of care in a midwife-managed delivery unit. <i>Midwifery</i> 11:163–73.</p> <p>Ickovics J, Kershaw T, Westdahl C, Schindler Rising S, Klima C, Reynolds H et al. 2003. Group prenatal care and preterm birth weight: results from a matched cohort study at public clinics. <i>Obstetrics &amp; Gynecology</i> 102:1051–7.</p> <p>Kelly P, Yong L, Langdon R, Stewart H &amp; Johnson M 2005. A comparison of the outcomes of partnership caseload midwifery and standard hospital care in low risk mothers. <i>Australian Journal of Advanced Nursing</i> 22:21–7.</p> <p>Kennedy HP, Grant J, Walton C, Shaw-Battista J &amp; Sandall J 2010. Normalizing birth in England: a qualitative study. <i>Journal of Midwifery &amp; Women's Health</i> 55:262–9.</p> <p>McCourt C &amp; Pearce A 2000. Does continuity of carer matter to women in minority ethnic groups? <i>Midwifery</i> 16:145–54.</p> <p>Nagle C, Skouteris H, Hotchin A, Bruce L, Patterson D &amp; Teale G 2011. Continuity of midwifery care and gestational weight gain in obese women: a randomised controlled trial. <i>BMC Public Health</i> 11:174.</p> <p>Nicolson S, Pirotta M &amp; Chondros P 2005. Shared maternity care: all care—not enough responsibility? An audit of patient care communications pre- and post- a multi-faceted intervention. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 45:509–13.</p> <p>Palmer L, Cook A &amp; Courtot B 2010. Comparing models of maternity care serving women at risk of poor birth outcomes in Washington, DC. <i>Alternative Therapies in Health and Medicine</i> 16:48–56.</p> <p>Williams K, Lago L, Lainchbury A &amp; Eager K 2010. Mothers' views of caseload midwifery and the value of continuity of care at an Australian regional hospital. <i>Midwifery</i> 26:615–21.</p>
	Target group	<p>Correa-Velez I &amp; Ryan J 2012. Developing a best practice model of refugee maternity care. <i>Women and Birth</i> 25:13–22.</p> <p>Ickovics J, Kershaw T, Westdahl C, Schindler Rising S, Klima C, Reynolds H et al. 2003. Group prenatal care and preterm birth weight: results from a matched cohort study at public clinics. <i>Obstetrics &amp; Gynecology</i> 102:1051–7.</p> <p>McCourt C &amp; Pearce A 2000. Does continuity of carer matter to women in minority ethnic groups? <i>Midwifery</i> 16:145–54.</p> <p>Nagle C, Skouteris H, Hotchin A, Bruce L, Patterson D &amp; Teale G 2011. Continuity of midwifery care and gestational weight gain in obese women: a randomised controlled trial. <i>BMC Public Health</i> 11:174.</p> <p>Palmer L, Cook A &amp; Courtot B 2010. Comparing models of maternity care serving women at risk of poor birth outcomes in Washington, DC. <i>Alternative Therapies in Health and Medicine</i> 16:48–56.</p> <p>Begley C, Devane D, Clarke M, McCann C, Hughes P, Reilly M et al. 2011. Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. <i>BMC Pregnancy Childbirth</i> 11:85.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Carers	Professional affiliation of lead/primary carer	<p>Biró MA, Waldenström U &amp; Pannifex JH 2000. Team midwifery care in a tertiary level obstetric service: a randomized controlled trial. <i>Birth</i> 27:168–73.</p> <p>Biró MA, Waldenström U, Brown S &amp; Pannifex JH 2003. Satisfaction with team midwifery care for low- and high-risk women: a randomized controlled trial. <i>Birth</i> 30:1–10.</p> <p>Birthplace in England Collaborative Group 2011. Perinatal and maternal outcomes by planned place of birth for healthy women with low risk pregnancies: the Birthplace in England National Prospective Cohort Study. <i>BMJ</i> 343.</p> <p>Brown SJ, Davey M-A &amp; Bruinsma FJ 2005. Women's views and experiences of postnatal hospital care in the Victorian Survey of Recent Mothers 2000. <i>Midwifery</i> 21:109–26.</p> <p>Correa-Velez I &amp; Ryan J 2012. Developing a best practice model of refugee maternity care. <i>Women and Birth</i> 25:13–22.</p> <p>Davey M-A, Brown S &amp; Bruinsma F 2005. What is it about antenatal continuity of caregiver that matters to women? <i>Birth</i> 32:262–71.</p> <p>Dawson W, Brown S, Gunn J, McNair R &amp; Lumley J 2000. Sharing obstetric care: barriers to integrated systems of care. <i>The Australian and New Zealand Journal of Public Health</i> 24:401–6.</p> <p>Doherty D, Hornbuckle J, Hutchinson M, Henderson J, Montague G &amp; Newnham J 2008. Evaluation of pregnancy outcomes and cost effectiveness of models of antenatal care and preferred setting for labour and birth care in women at low risk of pregnancy complications. Perth: Western Australian Department of Health.</p> <p>Farquhar M, Camilleri-Ferrante C &amp; Todd C 2000. Continuity of care in maternity services: women's views of one team midwifery scheme. <i>Midwifery</i> 16:35–47.</p> <p>Gamble J, Creedy DK &amp; Teakle B 2007. Women's expectations of maternity services: a community-based survey. <i>Women and Birth: Journal of the Australian College of Midwives</i> 20:115–20.</p> <p>Harvey S, Jarrell J, Brant R, Stainton C &amp; Rach D 1996. A randomised, controlled trial of nurse-midwifery care. <i>Birth: Issues in Perinatal Care and Education</i> 23:128–35.</p> <p>Hatem M, Sandall J, Devane D, Soltani H &amp; Gates S 2008. Midwife-led versus other models of care for childbearing women. <i>Cochrane Database of Systematic Reviews</i>:CD004667.</p> <p>Homer C, Davis G &amp; Brodie P 2000. What do women feel about community-based antenatal care? <i>Australian and New Zealand Journal of Public Health</i> 24:590–5.</p> <p>Homer C, Davis G, Brodie P, Sheehan A, Barclay L, Wills J et al. 2001a. Collaboration in maternity care: a randomised controlled trial comparing community-based continuity of care with standard hospital care. <i>BJOG: An International Journal of Obstetrics and Gynaecology</i> 108:16–22.</p> <p>Homer C, Davis G, Cooke M &amp; Barclay L 2002. Women's experiences of continuity of midwifery care in a randomised controlled trial in Australia. <i>Midwifery</i> 18:102–12.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Carers	Professional affiliation of lead/primary carer ( <i>continued</i> )	<p>Hundley VA, Cruickshank FM, Milne JM, Glazener CM, Lang GD, Turner M et al. 1995. Satisfaction and continuity of care: staff views of care in a midwife-managed delivery unit. <i>Midwifery</i> 11:163–73.</p> <p>Ickovics J, Kershaw T, Westdahl C, Schindler Rising S, Klima C, Reynolds H et al. 2003. Group prenatal care and preterm birth weight: results from a matched cohort study at public clinics. <i>Obstetrics &amp; Gynecology</i> 102:1051–7.</p> <p>Kelly P, Yong L, Langdon R, Stewart H &amp; Johnson M 2005. A comparison of the outcomes of partnership caseload midwifery and standard hospital care in low risk mothers. <i>Australian Journal of Advanced Nursing</i> 22:21–7.</p> <p>Kennedy HP, Grant J, Walton C, Shaw-Battista J &amp; Sandall J 2010. Normalizing birth in England: a qualitative study. <i>Journal of Midwifery &amp; Women's Health</i> 55:262–9.</p> <p>Leap N, Sandall J, Buckland S &amp; Huber U 2010. Journey to confidence: women's experiences of pain in labour and relational continuity of care. <i>Journal of Midwifery &amp; Women's Health</i> 55:234–42.</p> <p>McCourt C, Page L, Hewison J &amp; Vail A 1998. Evaluation of one-to-one midwifery: women's responses to care. <i>Birth</i> 25:73–80.</p> <p>McCourt C &amp; Pearce A 2000. Does continuity of carer matter to women in minority ethnic groups? <i>Midwifery</i> 16:145–54.</p> <p>Nagle C, Skouteris H, Hotchin A, Bruce L, Patterson D &amp; Teale G 2011. Continuity of midwifery care and gestational weight gain in obese women: a randomised controlled trial. <i>BMC Public Health</i> 11:174.</p> <p>Nicolson S, Pirotta M &amp; Chondros P 2005. Shared maternity care: all care—not enough responsibility? An audit of patient care communications pre- and post- a multi-faceted intervention. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 45:509–13.</p> <p>Palmer L, Cook A &amp; Courtot B 2010. Comparing models of maternity care serving women at risk of poor birth outcomes in Washington, DC. <i>Alternative Therapies in Health and Medicine</i> 16:48–56.</p> <p>Passant L, Homer C &amp; Wills J 2003. From student to midwife: the experiences of newly graduated midwives working in an innovative model of midwifery care. <i>Australian Journal of Midwifery: Professional Journal of the Australian College of Midwives Incorporated</i> 16:18–21.</p> <p>Rowley (Foureur) M, Hensley MJ, Brinsmead MW &amp; Wlodarczyk JH 1995. Continuity of care by a midwife team versus routine care during pregnancy and birth: a randomised trial. <i>Medical Journal of Australia</i> 163:289–93.</p> <p>Sutherland G 2009. Role of general practitioners in primary maternity care in South Australia and Victoria. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 49:637–41.</p> <p>Waldenström U 1998. Continuity of carer and satisfaction. <i>Midwifery</i> 14:207–13.</p> <p>Waldenström U, McLachlan H, Forster D, Brennecke S &amp; Brown S 2001. Team midwife care: maternal and infant outcomes. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 41:257–64.</p> <p>Walker SB, Moore HD &amp; Eaton A 2004. North Queensland midwives' experience with a team model of midwifery care. <i>Australian Journal of Midwifery: Professional Journal of the Australian College of Midwives Incorporated</i> 17:17–22.</p> <p>Williams K, Lago L, Lainchbury A &amp; Eager K 2010. Mothers' views of caseload midwifery and the value of continuity of care at an Australian regional hospital. <i>Midwifery</i> 26:615–21.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

<b>Dimension</b>	<b>Data element</b>	<b>Reference</b>
Carers	Organisation of maternity care providers	<p>Fereday J &amp; Oster C 2010. Managing a work–life balance: the experiences of midwives working in a group practice setting. <i>Midwifery</i> 26:311–8.</p> <p>Kelly P, Yong L, Langdon R, Stewart H &amp; Johnson M 2005. A comparison of the outcomes of partnership caseload midwifery and standard hospital care in low risk mothers. <i>Australian Journal of Advanced Nursing</i> 22:21–7.</p> <p>McCourt C, Page L, Hewison J &amp; Vail A 1998. Evaluation of one-to-one midwifery: women’s responses to care. <i>Birth</i> 25:73–80.</p> <p>McCourt C &amp; Pearce A 2000. Does continuity of carer matter to women in minority ethnic groups? <i>Midwifery</i> 16:145–54.</p> <p>McLachlan HL, Forster DA, Yelland J, Rayner J &amp; Lumley J 2008. Is the organisation and structure of hospital postnatal care a barrier to quality care? Findings from a state-wide review in Victoria, Australia. <i>Midwifery</i> 24:358–70.</p> <p>Nagle C, Skouteris H, Hotchin A, Bruce L, Patterson D &amp; Teale G 2011. Continuity of midwifery care and gestational weight gain in obese women: a randomised controlled trial. <i>BMC Public Health</i> 11:174.</p> <p>Passant L, Homer C &amp; Wills J 2003. From student to midwife: the experiences of newly graduated midwives working in an innovative model of midwifery care. <i>Australian Journal of Midwifery: Professional Journal of the Australian College of Midwives Incorporated</i> 16:18–21.</p> <p>Waldenström U, McLachlan H, Forster D, Brennecke S &amp; Brown S 2001. Team midwife care: maternal and infant outcomes. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 41:257–64.</p> <p>Walker SB, Moore HD &amp; Eaton A 2004. North Queensland midwives’ experience with a team model of midwifery care. <i>Australian Journal of Midwifery: Professional Journal of the Australian College of Midwives Incorporated</i> 17:17–22.</p> <p>Williams K, Lago L, Lainchbury A &amp; Eager K 2010. Mothers’ views of caseload midwifery and the value of continuity of care at an Australian regional hospital. <i>Midwifery</i> 26:615–21.</p>
	Size of caseload	<p>Fereday J &amp; Oster C 2010. Managing a work–life balance: the experiences of midwives working in a group practice setting. <i>Midwifery</i> 26:311–8.</p> <p>Hatem M, Sandall J, Devane D, Soltani H &amp; Gates S 2008. Midwife-led versus other models of care for childbearing women. <i>Cochrane Database of Systematic Reviews</i>:CD004667.</p> <p>McCourt C, Page L, Hewison J &amp; Vail A 1998. Evaluation of one-to-one midwifery: women’s responses to care. <i>Birth</i> 25:7380.</p> <p>McCourt C &amp; Pearce A 2000. Does continuity of carer matter to women in minority ethnic groups? <i>Midwifery</i> 16:145–54.</p> <p>Williams K, Lago L, Lainchbury A &amp; Eager K 2010. Mothers’ views of caseload midwifery and the value of continuity of care at an Australian regional hospital. <i>Midwifery</i> 26:615–21.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Carers	Continuity of lead carer	<p>Begley C, Devane D, Clarke M, McCann C, Hughes P, Reilly M et al. 2011. Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. <i>BMC Pregnancy Childbirth</i> 11:85.</p> <p>Biró MA, Waldenström U &amp; Pannifex JH 2000. Team midwifery care in a tertiary level obstetric service: a randomized controlled trial. <i>Birth</i> 27:168–73.</p> <p>Biró MA, Waldenström U, Brown S &amp; Pannifex JH 2003. Satisfaction with team midwifery care for low- and high-risk women: a randomized controlled trial. <i>Birth</i> 30:1–10.</p> <p>Brown SJ, Davey M-A &amp; Bruinsma FJ 2005. Women's views and experiences of postnatal hospital care in the Victorian Survey of Recent Mothers 2000. <i>Midwifery</i> 21:109–26.</p> <p>Correa-Velez I &amp; Ryan J 2012. Developing a best practice model of refugee maternity care. <i>Women and Birth</i> 25:13–22.</p> <p>Coyle KL, Hauck Y, Percival P &amp; Kristjanson LJ 2001. Ongoing relationships with a personal focus: mothers' perceptions of birth centre versus hospital care. <i>Midwifery</i> 17:171–81.</p> <p>Davey M-A, Brown S &amp; Bruinsma F 2005. What is it about antenatal continuity of caregiver that matters to women? <i>Birth</i> 32:262–71.</p> <p>Dawson W, Brown S, Gunn J, McNair R &amp; Lumley J 2000. Sharing obstetric care: barriers to integrated systems of care. <i>The Australian and New Zealand Journal of Public Health</i> 24:401–6.</p> <p>Doherty D, Hornbuckle J, Hutchinson M, Henderson J, Montague G &amp; Newnham J 2008. Evaluation of pregnancy outcomes and cost effectiveness of models of antenatal care and preferred setting for labour and birth care in women at low risk of pregnancy complications. Perth: Western Australian Department of Health.</p> <p>Farquhar M, Camilleri-Ferrante C &amp; Todd C 2000. Continuity of care in maternity services: women's views of one team midwifery scheme. <i>Midwifery</i> 16:35–47.</p> <p>Fereday J &amp; Oster C 2010. Managing a work–life balance: the experiences of midwives working in a group practice setting. <i>Midwifery</i> 26:311–8.</p> <p>Gamble J, Creedy DK &amp; Teakle B 2007. Women's expectations of maternity services: a community-based survey. <i>Women and Birth: Journal of the Australian College of Midwives</i> 20:115–20.</p> <p>Hatem M, Sandall J, Devane D, Soltani H &amp; Gates S 2008. Midwife-led versus other models of care for childbearing women. <i>Cochrane Database of Systematic Reviews</i>:CD004667.</p> <p>Homer C, Davis G &amp; Brodie P 2000. What do women feel about community-based antenatal care? <i>Australian and New Zealand Journal of Public Health</i> 24:590–5.</p> <p>Homer C, Davis G, Brodie P, Sheehan A, Barclay L, Wills J et al. 2001a. Collaboration in maternity care: a randomised controlled trial comparing community-based continuity of care with standard hospital care. <i>BJOG: An International Journal of Obstetrics and Gynaecology</i> 108:16–22.</p> <p>Homer C, Davis G, Cooke M &amp; Barclay L 2002. Women's experiences of continuity of midwifery care in a randomised controlled trial in Australia. <i>Midwifery</i> 18:102–12.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Carers	Continuity of lead carer ( <i>continued</i> )	<p>Hundley VA, Cruickshank FM, Milne JM, Glazener CM, Lang GD, Turner M et al. 1995. Satisfaction and continuity of care: staff views of care in a midwife-managed delivery unit. <i>Midwifery</i> 11:163–73.</p> <p>Kelly P, Yong L, Langdon R, Stewart H &amp; Johnson M 2005. A comparison of the outcomes of partnership caseload midwifery and standard hospital care in low risk mothers. <i>Australian Journal of Advanced Nursing</i> 22:21–7.</p> <p>Kennedy HP, Grant J, Walton C, Shaw-Battista J &amp; Sandall J 2010. Normalizing birth in England: a qualitative study. <i>Journal of Midwifery &amp; Women's Health</i> 55:262–9.</p> <p>Leap N, Sandall J, Buckland S &amp; Huber U 2010. Journey to confidence: women's experiences of pain in labour and relational continuity of care. <i>Journal of Midwifery &amp; Women's Health</i> 55:234–42.</p> <p>McCourt C, Page L, Hewison J &amp; Vail A 1998. Evaluation of one-to-one midwifery: women's responses to care. <i>Birth</i> 25:73–80.</p> <p>McCourt C &amp; Pearce A 2000. Does continuity of carer matter to women in minority ethnic groups? <i>Midwifery</i> 16:145–54.</p> <p>McLachlan HL, Forster DA, Yelland J, Rayner J &amp; Lumley J 2008. Is the organisation and structure of hospital postnatal care a barrier to quality care? Findings from a state-wide review in Victoria, Australia. <i>Midwifery</i> 24:358–70.</p> <p>McLachlan HL, Gold L, Forster DA, Yelland J, Rayner J &amp; Rayner S 2009. Women's views of postnatal care in the context of the increasing pressure on postnatal beds in Australia. <i>Women and Birth: Journal of the Australian College of Midwives</i> 22:128–33.</p> <p>Nagle C, Skouteris H, Hotchin A, Bruce L, Patterson D &amp; Teale G 2011. Continuity of midwifery care and gestational weight gain in obese women: a randomised controlled trial. <i>BMC Public Health</i> 11:174.</p> <p>Nicolson S, Pirotta M &amp; Chondros P 2005. Shared maternity care: all care—not enough responsibility? An audit of patient care communications pre- and post- a multi-faceted intervention. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 45:509–13.</p> <p>Palmer L, Cook A &amp; Courtot B 2010. Comparing models of maternity care serving women at risk of poor birth outcomes in Washington, DC. <i>Alternative Therapies in Health and Medicine</i> 16:48–56.</p> <p>Passant L, Homer C &amp; Wills J 2003. From student to midwife: the experiences of newly graduated midwives working in an innovative model of midwifery care. <i>Australian Journal of Midwifery: Professional Journal of the Australian College of Midwives Incorporated</i> 16:18–21.</p> <p>Rowley (Foureur) M, Hensley MJ, Brinsmead MW &amp; Wlodarczyk JH 1995. Continuity of care by a midwife team versus routine care during pregnancy and birth: a randomised trial. <i>Medical Journal of Australia</i> 163:289–93.</p> <p>Sutherland G 2009. Role of general practitioners in primary maternity care in South Australia and Victoria. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 49:637–41.</p> <p>Waldenström U 1998. Continuity of carer and satisfaction. <i>Midwifery</i> 14:207–13.</p> <p>Waldenström U, McLachlan H, Forster D, Brennecke S &amp; Brown S 2001. Team midwife care: maternal and infant outcomes. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 41:257–64.</p> <p>Walker SB, Moore HD &amp; Eaton A 2004. North Queensland midwives' experience with a team model of midwifery care. <i>Australian Journal of Midwifery: Professional Journal of the Australian College of Midwives Incorporated</i> 17:17–22.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Carers	Continuity of lead carer ( <i>continued</i> )	Williams K, Lago L, Lainchbury A & Eager K 2010. Mothers' views of caseload midwifery and the value of continuity of care at an Australian regional hospital. <i>Midwifery</i> 26:615–21.
	Professional affiliation of other routine carer(s)	<p>Begley C, Devane D, Clarke M, McCann C, Hughes P, Reilly M et al. 2011. Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. <i>BMC Pregnancy Childbirth</i> 11:85.</p> <p>Biró MA, Waldenström U &amp; Pannifex JH 2000. Team midwifery care in a tertiary level obstetric service: a randomized controlled trial. <i>Birth</i> 27:168–73.</p> <p>Biró MA, Waldenström U, Brown S &amp; Pannifex JH 2003. Satisfaction with team midwifery care for low- and high-risk women: a randomized controlled trial. <i>Birth</i> 30:1–10.</p> <p>Correa-Velez I &amp; Ryan J 2012. Developing a best practice model of refugee maternity care. <i>Women and Birth</i> 25:13–22.</p> <p>Dawson W, Brown S, Gunn J, McNair R &amp; Lumley J 2000. Sharing obstetric care: barriers to integrated systems of care. <i>The Australian and New Zealand Journal of Public Health</i> 24:401–6.</p> <p>Doherty D, Hornbuckle J, Hutchinson M, Henderson J, Montague G &amp; Newnham J 2008. Evaluation of pregnancy outcomes and cost effectiveness of models of antenatal care and preferred setting for labour and birth care in women at low risk of pregnancy complications. Perth: Western Australian Department of Health.</p> <p>Gamble J, Creedy DK &amp; Teakle B 2007. Women's expectations of maternity services: a community-based survey. <i>Women and Birth: Journal of the Australian College of Midwives</i> 20:115–20.</p> <p>Harvey S, Jarrell J, Brant R, Stainton C &amp; Rach D 1996. A randomised, controlled trial of nurse-midwifery care. <i>Birth: Issues in Perinatal Care and Education</i> 23:128–35.</p> <p>Hatem M, Sandall J, Devane D, Soltani H &amp; Gates S 2008. Midwife-led versus other models of care for childbearing women. <i>Cochrane Database of Systematic Reviews</i>:CD004667.</p> <p>Homer C, Davis G &amp; Brodie P 2000. What do women feel about community-based antenatal care? <i>Australian and New Zealand Journal of Public Health</i> 24:590–5.</p> <p>Homer C, Davis G, Brodie P, Sheehan A, Barclay L, Wills J et al. 2001a. Collaboration in maternity care: a randomised controlled trial comparing community-based continuity of care with standard hospital care. <i>BJOG: An International Journal of Obstetrics and Gynaecology</i> 108:16–22.</p> <p>Homer C, Davis G, Cooke M &amp; Barclay L 2002. Women's experiences of continuity of midwifery care in a randomised controlled trial in Australia. <i>Midwifery</i> 18:102–12.</p> <p>Ickovics J, Kershaw T, Westdahl C, Schindler Rising S, Klima C, Reynolds H et al. 2003. Group prenatal care and preterm birth weight: results from a matched cohort study at public clinics. <i>Obstetrics &amp; Gynecology</i> 102:1051–7.</p> <p>Kelly P, Yong L, Langdon R, Stewart H &amp; Johnson M 2005. A comparison of the outcomes of partnership caseload midwifery and standard hospital care in low risk mothers. <i>Australian Journal of Advanced Nursing</i> 22:21–7.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Carers	Professional affiliation of other routine carer(s) ( <i>continued</i> )	<p>Nicolson S, Pirotta M &amp; Chondros P 2005. Shared maternity care: all care—not enough responsibility? An audit of patient care communications pre- and post- a multi-faceted intervention. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 45:509–13.</p> <p>Palmer L, Cook A &amp; Courtot B 2010. Comparing models of maternity care serving women at risk of poor birth outcomes in Washington, DC. <i>Alternative Therapies in Health and Medicine</i> 16:48–56.</p> <p>Rowley (Foureur) M, Hensley MJ, Brinsmead MW &amp; Wlodarczyk JH 1995. Continuity of care by a midwife team versus routine care during pregnancy and birth: a randomised trial. <i>Medical Journal of Australia</i> 163:289–93.</p> <p>Sutherland G 2009. Role of general practitioners in primary maternity care in South Australia and Victoria. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 49:637–41.</p>
	Number of maternity care providers	<p>Begley C, Devane D, Clarke M, McCann C, Hughes P, Reilly M et al. 2011. Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. <i>BMC Pregnancy Childbirth</i> 11:85.</p> <p>Biró MA, Waldenström U &amp; Pannifex JH 2000. Team midwifery care in a tertiary level obstetric service: a randomized controlled trial. <i>Birth</i> 27:168–73.</p> <p>Biró MA, Waldenström U, Brown S &amp; Pannifex JH 2003. Satisfaction with Team Midwifery Care for Low- and High-Risk Women: A Randomized Controlled Trial. <i>Birth</i> 30:1-10.</p> <p>Brown SJ, Davey M-A &amp; Bruinsma FJ 2005. Women's views and experiences of postnatal hospital care in the Victorian Survey of Recent Mothers 2000. <i>Midwifery</i> 21:109–26.</p> <p>Coyle KL, Hauck Y, Percival P &amp; Kristjanson LJ 2001. Ongoing relationships with a personal focus: mothers' perceptions of birth centre versus hospital care. <i>Midwifery</i> 17:171–81.</p> <p>Davey M-A, Brown S &amp; Bruinsma F 2005. What is it about antenatal continuity of caregiver that matters to women? <i>Birth</i> 32:262–71.</p> <p>Dawson W, Brown S, Gunn J, McNair R &amp; Lumley J 2000. Sharing obstetric care: barriers to integrated systems of care. <i>The Australian and New Zealand Journal of Public Health</i> 24:401–6.</p> <p>Farquhar M, Camilleri-Ferrante C &amp; Todd C 2000. Continuity of care in maternity services: women's views of one team midwifery scheme. <i>Midwifery</i> 16:35–47.</p> <p>Fereday J &amp; Oster C 2010. Managing a work–life balance: the experiences of midwives working in a group practice setting. <i>Midwifery</i> 26:311–8.</p> <p>Harvey S, Jarrell J, Brant R, Stainton C &amp; Rach D 1996. A randomised, controlled trial of nurse-midwifery care. <i>Birth: Issues in Perinatal Care and Education</i> 23:128–35.</p> <p>Hatem M, Sandall J, Devane D, Soltani H &amp; Gates S 2008. Midwife-led versus other models of care for childbearing women. <i>Cochrane Database of Systematic Reviews</i>:CD004667.</p> <p>Homer C, Davis G &amp; Brodie P 2000. What do women feel about community-based antenatal care? <i>Australian and New Zealand Journal of Public Health</i> 24:590–5.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Carers	Number of maternity care providers (continued)	<p>Homer C, Davis G, Brodie P, Sheehan A, Barclay L, Wills J et al. 2001a. Collaboration in maternity care: a randomised controlled trial comparing community-based continuity of care with standard hospital care. <i>BJOG: An International Journal of Obstetrics and Gynaecology</i> 108:16–22.</p> <p>Homer C, Davis G, Cooke M &amp; Barclay L 2002. Women's experiences of continuity of midwifery care in a randomised controlled trial in Australia. <i>Midwifery</i> 18:102–12.</p> <p>Hundley VA, Cruickshank FM, Milne JM, Glazener CM, Lang GD, Turner M et al. 1995. Satisfaction and continuity of care: staff views of care in a midwife-managed delivery unit. <i>Midwifery</i> 11:163–73.</p> <p>Kelly P, Yong L, Langdon R, Stewart H &amp; Johnson M 2005. A comparison of the outcomes of partnership caseload midwifery and standard hospital care in low risk mothers. <i>Australian Journal of Advanced Nursing</i> 22:21–7.</p> <p>Leap N, Sandall J, Buckland S &amp; Huber U 2010. Journey to confidence: women's experiences of pain in labour and relational continuity of care. <i>Journal of Midwifery &amp; Women's Health</i> 55:234–42.</p> <p>McCourt C, Page L, Hewison J &amp; Vail A 1998. Evaluation of one-to-one midwifery: women's responses to care. <i>Birth</i> 25:73–80.</p> <p>McCourt C &amp; Pearce A 2000. Does continuity of carer matter to women in minority ethnic groups? <i>Midwifery</i> 16:145–54.</p> <p>McLachlan HL, Forster DA, Yelland J, Rayner J &amp; Lumley J 2008. Is the organisation and structure of hospital postnatal care a barrier to quality care? Findings from a state-wide review in Victoria, Australia. <i>Midwifery</i> 24:358–70.</p> <p>McLachlan HL, Gold L, Forster DA, Yelland J, Rayner J &amp; Rayner S 2009. Women's views of postnatal care in the context of the increasing pressure on postnatal beds in Australia. <i>Women and Birth: Journal of the Australian College of Midwives</i> 22:128–33.</p> <p>Palmer L, Cook A &amp; Courtot B 2010. Comparing models of maternity care serving women at risk of poor birth outcomes in Washington, DC. <i>Alternative Therapies in Health and Medicine</i> 16:48–56.</p> <p>Rowley (Foureur) M, Hensley MJ, Brinsmead MW &amp; Wlodarczyk JH 1995. Continuity of care by a midwife team versus routine care during pregnancy and birth: a randomised trial. <i>Medical Journal of Australia</i> 163:289–93.</p> <p>Sutherland G 2009. Role of general practitioners in primary maternity care in South Australia and Victoria. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 49:637–41.</p> <p>Waldenström U 1998. Continuity of carer and satisfaction. <i>Midwifery</i> 14:207–13.</p> <p>Waldenström U, McLachlan H, Forster D, Brennecke S &amp; Brown S 2001. Team midwife care: maternal and infant outcomes. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 41:257–64.</p> <p>Walker SB, Moore HD &amp; Eaton A 2004. North Queensland midwives' experience with a team model of midwifery care. <i>Australian Journal of Midwifery: Professional Journal of the Australian College of Midwives Incorporated</i> 17:17–22.</p> <p>Williams K, Lago L, Lainchbury A &amp; Eager K 2010. Mothers' views of caseload midwifery and the value of continuity of care at an Australian regional hospital. <i>Midwifery</i> 26:615–21.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Care	Continuity of location of care	Homer C, Biggs J, Vaughan G & Sullivan E 2011. Mapping maternity services in Australia: location, classification and services. Australian Health Review: A Publication of the Australian Hospital Association 35:222–9.
	Continuity of information	Dawson W, Brown S, Gunn J, McNair R & Lumley J 2000. Sharing obstetric care: barriers to integrated systems of care. The Australian and New Zealand Journal of Public Health 24:401–6. Nicolson S, Pirotta M & Chondros P 2005. Shared maternity care: all care—not enough responsibility? An audit of patient care communications pre- and post- a multi-faceted intervention. Australian and New Zealand Journal of Obstetrics and Gynaecology 45:509–13.
	Main planned location of antenatal care	Begley C, Devane D, Clarke M, McCann C, Hughes P, Reilly M et al. 2011. Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. BMC Pregnancy Childbirth 11:85. Brown SJ, Davey M-A & Bruinsma FJ 2005. Women's views and experiences of postnatal hospital care in the Victorian Survey of Recent Mothers 2000. Midwifery 21:109–26. Dawson W, Brown S, Gunn J, McNair R & Lumley J 2000. Sharing obstetric care: barriers to integrated systems of care. The Australian and New Zealand Journal of Public Health 24:401–6. Doherty D, Hornbuckle J, Hutchinson M, Henderson J, Montague G & Newnham J 2008. Evaluation of pregnancy outcomes and cost effectiveness of models of antenatal care and preferred setting for labour and birth care in women at low risk of pregnancy complications. Perth: Western Australian Department of Health. Hatem M, Sandall J, Devane D, Soltani H & Gates S 2008. Midwife-led versus other models of care for childbearing women. Cochrane Database of Systematic Reviews:CD004667. Homer C, Davis G & Brodie P 2000. What do women feel about community-based antenatal care? Australian and New Zealand Journal of Public Health 24:590–5. Homer C, Davis G, Brodie P, Sheehan A, Barclay L, Wills J et al. 2001a. Collaboration in maternity care: a randomised controlled trial comparing community-based continuity of care with standard hospital care. BJOG: An International Journal of Obstetrics and Gynaecology 108:16–22. Homer C, Davis G, Cooke M & Barclay L 2002. Women's experiences of continuity of midwifery care in a randomised controlled trial in Australia. Midwifery 18:102–12. Ickovics J, Kershaw T, Westdahl C, Schindler Rising S, Klima C, Reynolds H et al. 2003. Group prenatal care and preterm birth weight: results from a matched cohort study at public clinics. Obstetrics & Gynecology 102:1051–7. Kelly P, Yong L, Langdon R, Stewart H & Johnson M 2005. A comparison of the outcomes of partnership caseload midwifery and standard hospital care in low risk mothers. Australian Journal of Advanced Nursing 22:21–7.

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Care	Main planned location of antenatal care ( <i>continued</i> )	<p>McCourt C, Page L, Hewison J &amp; Vail A 1998. Evaluation of one-to-one midwifery: women's responses to care. <i>Birth</i> 25:73–80.</p> <p>Nicolson S, Pirotta M &amp; Chondros P 2005. Shared maternity care: all care—not enough responsibility? An audit of patient care communications pre- and post- a multi-faceted intervention. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 45:509–13.</p> <p>Palmer L, Cook A &amp; Courtot B 2010. Comparing models of maternity care serving women at risk of poor birth outcomes in Washington, DC. <i>Alternative Therapies in Health and Medicine</i> 16:48–56.</p> <p>Sutherland G 2009. Role of general practitioners in primary maternity care in South Australia and Victoria. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 49:637–41.</p>
	Main planned location of intrapartum care	<p>Begley C, Devane D, Clarke M, McCann C, Hughes P, Reilly M et al. 2011. Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. <i>BMC Pregnancy Childbirth</i> 11:85.</p> <p>Birthplace in England Collaborative Group 2011. Perinatal and maternal outcomes by planned place of birth for healthy women with low risk pregnancies: the Birthplace in England National Prospective Cohort Study. <i>BMJ</i> 343.</p> <p>Brown SJ, Davey M-A &amp; Bruinsma FJ 2005. Women's views and experiences of postnatal hospital care in the Victorian Survey of Recent Mothers 2000. <i>Midwifery</i> 21:109–26.</p> <p>Dawson W, Brown S, Gunn J, McNair R &amp; Lumley J 2000. Sharing obstetric care: barriers to integrated systems of care. <i>The Australian and New Zealand Journal of Public Health</i> 24:401–6.</p> <p>Doherty D, Hornbuckle J, Hutchinson M, Henderson J, Montague G &amp; Newnham J 2008. Evaluation of pregnancy outcomes and cost effectiveness of models of antenatal care and preferred setting for labour and birth care in women at low risk of pregnancy complications. Perth: Western Australian Department of Health.</p> <p>Gamble J, Creedy DK &amp; Teakle B 2007. Women's expectations of maternity services: a community-based survey. <i>Women and Birth: Journal of the Australian College of Midwives</i> 20:115–20.</p> <p>Harvey S, Jarrell J, Brant R, Stainton C &amp; Rach D 1996. A randomised, controlled trial of nurse-midwifery care. <i>Birth: Issues in Perinatal Care and Education</i> 23:128–35.</p> <p>Hatem M, Sandall J, Devane D, Soltani H &amp; Gates S 2008. Midwife-led versus other models of care for childbearing women. <i>Cochrane Database of Systematic Reviews</i>:CD004667.</p> <p>Homer C, Davis G &amp; Brodie P 2000. What do women feel about community-based antenatal care? <i>Australian and New Zealand Journal of Public Health</i> 24:590–5.</p> <p>Homer C, Davis G, Brodie P, Sheehan A, Barclay L, Wills J et al. 2001a. Collaboration in maternity care: a randomised controlled trial comparing community-based continuity of care with standard hospital care. <i>BJOG: An International Journal of Obstetrics and Gynaecology</i> 108:16–22.</p> <p>Homer C, Davis G, Cooke M &amp; Barclay L 2002. Women's experiences of continuity of midwifery care in a randomised controlled trial in Australia. <i>Midwifery</i> 18:102–12.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Care	Main planned location of intrapartum care ( <i>continued</i> )	<p>Kelly P, Yong L, Langdon R, Stewart H &amp; Johnson M 2005. A comparison of the outcomes of partnership caseload midwifery and standard hospital care in low risk mothers. <i>Australian Journal of Advanced Nursing</i> 22:21–7.</p> <p>Palmer L, Cook A &amp; Courtot B 2010. Comparing models of maternity care serving women at risk of poor birth outcomes in Washington, DC. <i>Alternative Therapies in Health and Medicine</i> 16:48–56.</p> <p>Sutherland G 2009. Role of general practitioners in primary maternity care in South Australia and Victoria. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 49:637–41.</p>
	Main planned location of postnatal care	<p>Begley C, Devane D, Clarke M, McCann C, Hughes P, Reilly M et al. 2011. Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. <i>BMC Pregnancy Childbirth</i> 11:85.</p> <p>Brown SJ, Davey M-A &amp; Bruinsma FJ 2005. Women's views and experiences of postnatal hospital care in the Victorian Survey of Recent Mothers 2000. <i>Midwifery</i> 21:109–26.</p> <p>Doherty D, Hornbuckle J, Hutchinson M, Henderson J, Montague G &amp; Newnham J 2008. Evaluation of pregnancy outcomes and cost effectiveness of models of antenatal care and preferred setting for labour and birth care in women at low risk of pregnancy complications. Perth: Western Australian Department of Health.</p> <p>Farquhar M, Camilleri-Ferrante C &amp; Todd C 2000. Continuity of care in maternity services: women's views of one team midwifery scheme. <i>Midwifery</i> 16:35–47.</p> <p>Homer C, Davis G, Cooke M &amp; Barclay L 2002. Women's experiences of continuity of midwifery care in a randomised controlled trial in Australia. <i>Midwifery</i> 18:102–12.</p> <p>Kelly P, Yong L, Langdon R, Stewart H &amp; Johnson M 2005. A comparison of the outcomes of partnership caseload midwifery and standard hospital care in low risk mothers. <i>Australian Journal of Advanced Nursing</i> 22:21–7.</p> <p>McCourt C, Page L, Hewison J &amp; Vail A 1998. Evaluation of one-to-one midwifery: women's responses to care. <i>Birth</i> 25:73–80.</p> <p>McLachlan HL, Gold L, Forster DA, Yelland J, Rayner J &amp; Rayner S 2009. Women's views of postnatal care in the context of the increasing pressure on postnatal beds in Australia. <i>Women and Birth: Journal of the Australian College of Midwives</i> 22:128–33.</p> <p>Palmer L, Cook A &amp; Courtot B 2010. Comparing models of maternity care serving women at risk of poor birth outcomes in Washington, DC. <i>Alternative Therapies in Health and Medicine</i> 16:48–56.</p> <p>Sutherland G 2009. Role of general practitioners in primary maternity care in South Australia and Victoria. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 49:637–41.</p>
	Individual or group care	<p>Ickovics J, Kershaw T, Westdahl C, Schindler Rising S, Klima C, Reynolds H et al. 2003. Group prenatal care and preterm birth weight: results from a matched cohort study at public clinics. <i>Obstetrics &amp; Gynecology</i> 102:1051–7.</p>

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**Table D1 (continued): Primary research that supports elements of the Models of Care Framework**

Dimension	Data element	Reference
Care	Trimester of first clinical assessment	Doherty D, Hornbuckle J, Hutchinson M, Henderson J, Montague G & Newnham J 2008. Evaluation of pregnancy outcomes and cost effectiveness of models of antenatal care and preferred setting for labour and birth care in women at low risk of pregnancy complications. Perth: Western Australian Department of Health. Farquhar M, Camilleri-Ferrante C & Todd C 2000. Continuity of care in maternity services: women's views of one team midwifery scheme. <i>Midwifery</i> 16:35–47.
	Postnatal care end	Begley C, Devane D, Clarke M, McCann C, Hughes P, Reilly M et al. 2011. Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. <i>BMC Pregnancy Childbirth</i> 11:85. Biró MA, Waldenström U & Pannifex JH 2000. Team midwifery care in a tertiary level obstetric service: a randomized controlled trial. <i>Birth</i> 27:168–73. Brown SJ, Davey M-A & Bruinsma FJ 2005. Women's views and experiences of postnatal hospital care in the Victorian Survey of Recent Mothers 2000. <i>Midwifery</i> 21:109–26. Correa-Velez I & Ryan J 2012. Developing a best practice model of refugee maternity care. <i>Women and Birth</i> 25:13–22. Farquhar M, Camilleri-Ferrante C & Todd C 2000. Continuity of care in maternity services: women's views of one team midwifery scheme. <i>Midwifery</i> 16:35–47. Hatem M, Sandall J, Devane D, Soltani H & Gates S 2008. Midwife-led versus other models of care for childbearing women. <i>Cochrane Database of Systematic Reviews</i> :CD004667. Homer C, Davis G, Cooke M & Barclay L 2002. Women's experiences of continuity of midwifery care in a randomised controlled trial in Australia. <i>Midwifery</i> 18:102–12. Kelly P, Yong L, Langdon R, Stewart H & Johnson M 2005. A comparison of the outcomes of partnership caseload midwifery and standard hospital care in low risk mothers. <i>Australian Journal of Advanced Nursing</i> 22:21–7. McCourt C, Page L, Hewison J & Vail A 1998. Evaluation of one-to-one midwifery: women's responses to care. <i>Birth</i> 25:73–80. McLachlan HL, Forster DA, Yelland J, Rayner J & Lumley J 2008. Is the organisation and structure of hospital postnatal care a barrier to quality care? Findings from a state-wide review in Victoria, Australia. <i>Midwifery</i> 24:358–70. McLachlan HL, Gold L, Forster DA, Yelland J, Rayner J & Rayner S 2009. Women's views of postnatal care in the context of the increasing pressure on postnatal beds in Australia. <i>Women and Birth: Journal of the Australian College of Midwives</i> 22:128–33.
	Geographic location of model	Homer C, Biggs J, Vaughan G & Sullivan E 2011. Mapping maternity services in Australia: location, classification and services. <i>Australian Health Review: A Publication of the Australian Hospital Association</i> 35:222–9. Sutherland G 2009. Role of general practitioners in primary maternity care in South Australia and Victoria. <i>Australian and New Zealand Journal of Obstetrics and Gynaecology</i> 49:637–41.

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## Related publications

Australian Institute of Health and Welfare 2014. Foundations for enhanced maternity data collection and reporting in Australia: National Maternity Data Development Project Stage 1. Cat. no. PER 60. Canberra: AIHW.

Australian Institute of Health and Welfare 2014. Nomenclature for models of maternity care: consultation report – Foundations for enhanced maternity data collection and reporting in Australia: National Maternity Data Development Project Stage 1 Cat. no. PER 62. Canberra: AIHW.



This report presents a literature review on the development of a nomenclature for models of maternity care in Australia. It is one of several components of the National Maternity Data Development Project and is a companion report to the publication, *Foundations for enhanced maternity data collection and reporting in Australia: National Maternity Data Development Project Stage 1*.