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INTEGRATED PRIMARY CARE CENTRES AND POLYCLINICS

A RAPID REVIEW

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ABBREVIATIONS

APHCRI	Australian Primary Health Care Research Institute
ACCHS	Aboriginal Community Controlled Health Services
CHC	Community health centre
CHCC	Community Health Care Centre
D&A	Drug and alcohol
EPC	Enhanced Primary Care
FFS	Fee for service
FMG	Family Medicine Group
FTE	Full time equivalent
GMS	General Medical Services
GP	General practitioners
MBS	Medicare Benefits Schedule
NGO	Non-government organisation
NP	Nurse practitioner
NSW	New South Wales
PHC	Primary health care
PMS	Personal Medical Services
RN	Registered nurse
QOF	Quality and Outcomes Framework
SA	South Australia
UK	United Kingdom
US	United States of America

INTRODUCTION

The purpose of the report is to summarise what is known about the use of integrated primary health care centres in Australia and comparable countries, what is known about their effectiveness and to identify what Australia can learn from this. This reflects a long standing concern in Australia and other countries about heath care integration, which has been variously expected to improve consumers and provider satisfaction, achieve better health outcomes and reduce the use of specialist and hospital services (Kodner and Spreeuwenberg 2002).

Interest in integrated primary health care centres is not new. In 1920 Lord Dawson wrote:

> The domiciliary services of a given district would be based on a Primary Health Centre – an institution equipped for services of curative and preventative medicine to be conducted by the general practitioners of that district, in conjunction with an efficient nursing service and with the aid of visiting consultants and specialists... it would be impossible to exaggerate the benefits that would accrue to the community by the establishment of Health Centres. (Dawson cited in Imison, Naylor et al. 2008)

Almost ninety years on, these are now seen as by many as a logical 'next step' in primary health care development. Two Australian states have programs (HealthOne NSW in New South Wales and GP Plus in South Australia) and the Commonwealth has a national initiative (GP Super Clinics). They are also included in the reforms suggested in the Interim Report of the National Health and Hospitals Reform Commission (National Health and Hospitals Reform Commission 2009). This makes it timely to review Australian and international experience of this approach to providing primary health care provision.

This review should be read with due attention to its limitations. It does not consider whether integration is a 'good thing' or, more realistically when it is beneficial and for whom. It focuses on organisations rather than the processes such as teamwork through which integrated care is produced and which may occur in many different types of organisation. It focuses on individual centres or services without taking account of the integration which may occur at other levels of the system. Finally, it does not compare the performance of integrated primary health care centres with alternative structures such as networks, virtual organisations, or centres where services are co-located but not integrated. These issues are re-visited in the discussion.

The report begins with an overview of the history and policy background relating to integrated primary health care centres in Australia and comparable countries. A brief summary of the methods used in the review is followed by a description of models of integrated primary health care centres found in the review, together with some of the factors that have supported or hindered their development. This is followed by an analysis of the evidence for their effectiveness. The final section of the report discusses the findings and highlights issues that arise for the development of integrated primary heath care centres in Australia.

Throughout this report the term 'integrated primary health care centre' is used to refer to a single organisation which aims to produce integrated primary health care and has clinicians from at least three professional backgrounds (often GPs, nurses and allied health professionals). As will become clear, these may all work from a single building or may be distributed across a number of sites, as with a 'hub and spoke' model. Integration means many different things in different contexts. The definition accepted for the purpose of this report is "bringing together of inputs, delivery, management and organisation of services as a means [of] improving access, quality, user satisfaction and efficiency" (Gröne and Garcia-Barbero 2001).

HISTORY AND POLICY BACKGROUND

This section gives an overview of the current models of integrated primary health care centres in Australia and comparable countries and some of the factors that have supported or hindered their development. More detailed descriptions of the models are found in Appendix 1.

AUSTRALIA

The move towards integrated primary health care centres builds on developments in primary health care that have taken place over the last two decades. A succession of policy documents from the National Health Strategy (National Health Strategy 1991) onwards has highlighted the need for more comprehensive and coordinated primary health care, particularly for vulnerable and under-served groups and people with complex and chronic health care needs. They also recognised that this would require much closer collaboration across Australian primary health care, in particular between general practice, community health and private allied health services. More integrated primary health care has also been seen as supporting primary/secondary integration and more recently as creating new opportunities for addressing workforce shortages (NSW Health 2006).

Forms of integrated primary health care centres have existed in Australia for a number of years, in particular Aboriginal Community Controlled Health Services and Victorian community health centres with general practitioners. More recently, New South Wales and South Australia have begun establishing integrated primary health care centres through the HealthOne NSW (NSW Health 2009) and GP Plus (SA Department of Health 2009) programs respectively, while at national level the GP Super Clinic (Australian Department of Health and Ageing 2009a) program is now beginning to be implemented. These more recent programs are at an early stage and there is as yet little information about their operation and none about their impacts.

Integrating primary health care requires developments in at least four areas: models of care, organisational structures, funding, and political arrangements to support the development of more coordinated primary health care. Each of these elements is needed for a robust system of integration, whether through primary health care centres or other structures.

Work on models for coordinated care dates back to the early shared care programs initiated by Divisions of General Practice. These provided agreed structures for combining general practice and (usually) specialist care. However, they did not always involve other primary health care providers and their reach was restricted to patients enroled in the shared care program. The Coordinated Care Trials (Commonwealth Department of Health and Aged Care 2001) developed the idea of general practitioners as care coordinators who could assess patients and facilitate their access to other primary health and home care services, although once again for enroled patients only. The Enhanced Primary Care program (Australian Department of Health and Ageing 2009b) removed this limit by creating Medicare items which made health assessments universally available for defined categories of patients and care planning for those with chronic conditions and supported the referral of patients who met relevant criteria to allied health services.

However appropriate organisation structures were generally not available to support the use of these models of care. This gap stimulated a number of programs to strengthen the capacity of general practice, including the programs encouraging amalgamation of smaller practices, developments in practice nursing (Australian Department of Health and Ageing 2005, 2009c)

and the More Allied Health Services program (Australian Department of Health and Ageing 2009d) to bring allied health services into the general practice network. A number of states have introduced voluntary networks of service providers to support care coordination, most notably Victoria with the Primary Care Partnerships. However, while these networks have improved coordination, they have lacked the structure required to provide integrated primary health care (McDonald 2009). More robust organisations are required to support more integrated models of care, and integrated primary health care centres have been seen as one approach to meeting this need.

Funding integrated primary health care has been a challenge within the Australian system. One problem has been the lack of funding for 'behind the scenes' activity required to coordinate care. Medicare Benefits Schedule items for care planning and care coordination have addressed this in part, and recent items for allied health services have for the first time provided some public funding for private allied health services in the community. The Coordinated Care Trials showed the potential of funds pooling, but this has not been taken up elsewhere except in very limited contexts (eg for small rural communities and some Indigenous services), leaving primary health care with the challenge of providing flexible and responsive patient care using a number of different, often conflicting, sources of funding.

At the political level, agreement about the need for more coordinated care has led to little concerted action across jurisdictions. The work of the Council of Australian Governments and national frameworks such as the National Health Priority Areas have provided some structure, which may be strengthened by the outcome of current health reform processes. However, coordination between the Commonwealth and the states is still very limited, as the existence of separate integrated primary health care programs attests.

As this brief history suggests, there has been some progress in each of these four areas. However, more work is needed in each if integrated primary health care centres are to become a core element of Australian primary health care.

CANADA

The provinces have the responsibility for planning and delivering health services, and there is considerable diversity in how primary healthcare has developed. Over two thirds of family physicians practice in private offices/clinics (Martin and Hogg 2004), and until recently there were relatively few practice nurses. However, 'community health centres', many including family physicians, are a well established part of the health system in most provinces (Albrecht 1998).

Increasing problems in the health care system, including threats to access because of shortages of family physician, difficulties with continuity and coordination of services and quality of care have led to a number of reforms. The Primary Health Care Transition Fund, a six-year national investment (2000-2006), stimulated a range of initiatives to address these concerns, including the trialling of new models of care which have included inter-professional teams, electronic medical records and patient enrolment (Canadian Health Services Research Foundation 2006). Ontario has been experimenting with general practice centred models and alternative funding arrangements since the late 1990s. These have developed over time, with the Ontario Medical Association playing an important leadership role. A recent comparison of four models with varying arrangements for payment, team composition and governance found that each had characteristics that attracted particular types of physicians and patients, and that a number of

models were required to allow for the range of patient and provider needs[1]. The most recent model, 'Family Heath Teams', has built on the previous models of networked general practices, introducing additional funding for allied health care professionals to support interprofessional collaboration.

Quebec has taken a different approach. The introduction of Family Medicine Groups has been a more radical change, involving the first attempt at networking family physicians and co-locating nurses from community health centres within practices. Although Family Medicine Groups are expected to work closely with other community health centre staff as well as other local services, this does not create the critical mass required for an integrated primary health care centre.

Other provinces have taken different approaches to improving integration and coordination, particularly in relation to chronic disease, rather than primary health care as a whole. For example, British Columbia is establishing Integrated Health Networks. These are partnership approaches for improving the coordination of care for people with two or more chronic conditions (Impact BC 2009).

NEW ZEALAND

Prior to the 1990s-2000s, there was little integration among the three major primary care provider groups: general practices**,** 'community controlled primary health care centres' (serving disadvantaged communities), and publicly provided community health services (which did not include GPs). The reforms of the mid 1990s increased competition between providers (Cumming and Salmond 1998), but also motivated the development of primary health care networks amongst GPs (through Independent Practitioner Associations), and amongst the not-for-profit community controlled primary health organisations (through a peak national organisation). Concerns over a lack of clear direction and poor access to primary health care as a result of high user fees led to the development of a Primary Health Care Strategy in 2001, which aimed to improve health and reducing inequalities through a strengthened primary health care system (King 2001). Major reforms included increased funding to subsidise GP fees and to expand services, and the development of Primary Health Organisations, with capitation funding to plan, contract and, to a lesser extent, provide primary health care services (McDonald, Powell Davies et al. 2007).

Most Primary Health Organisations are best thought of as networks rather than single organisations for planning and delivering services, although some do operate in this way - for example community controlled primary health care centres which have also taken on the role of a Primary Health Organisation. Although some Primary Health Organisations have working relationships with a range of service providers, little is known about the impact of the reforms on service integration. Other developments have been more local, and have focused on improving integration between general practices and secondary/tertiary care services, with a particular focus on improving the management of long term conditions. While there have been some local attempts at integrating community health services with general practice through Primary Health Organisations, these have sometimes been unpopular with the public who have been concerned that such a move represents a privatisation of public services[2]. A new government elected at the end of 2008 aims to increase such integration of primary and

[1] Personal communication with investigators as part of APHCRI Linkage and Exchange Traveling Fellowship Report (Julie McDonald).
[2] Personal communication, Dr Judith Smith, formerly Senior Visiting Research Fellow, Health Services Research Centre, Victoria University of Wellington.

community services and is also interested in developing polyclinics, although the nature of these is not yet known.

EUROPE

Central and Eastern Europe

Since the break-up of the Soviet bloc, most countries are introducing more market mechanisms, and patient expectations of access, choice and convenience are shaping new models of health care delivery (Lember and Lember 2002). However, despite the shift of primary care provision from state-owned to independent practices, polyclinics still do exist, albeit under new ownership and names (Rechel and McKee 2008). They involve co-located primary and more specialist services, and generally provide most primary health care services for a geographically defined population. They are usually found in urban areas (Rechel and McKee 2008).

Denmark

Primary health care is provided through two main routes: regionally administered, self employed private primary care practitioners, including GPs, specialists, physiotherapists, dentists, chiropractors and pharmacists, financed through a mix of capitation and fee-for-service payments and co-payments, and through staff working in municipal health services. GPs work in either solo or group practices and are gatekeepers to other health care services. There is an increasing trend towards group practices, supported by the government in order to strengthen the potential for teamwork (Strandberg-Larsen M, Nielsen MB et al. 2007). A major structural reform in 2007 transferred health care responsibilities for prevention and rehabilitation from the regional to the local municipal level. At the same time, the hospital sector was reorganised and centralised. These reforms are flowing on to primary health care with two major changes. One involves re-organising GPs into larger practices which can support additional staff and an enhanced role in chronic disease management and treating minor acute conditions that would otherwise need hospital treatment (Kronborg C 2008). The other involves establishing municipal health centres, with 28 pilots funded to develop and test various models. However, these are not able to employ physicians, and the scope of the health centres is limited to nurses and allied health professionals (Pedersen KM 2006).

Finland

The Finnish health care system is decentralised with financing and provision devolved to local municipalities. These local authorities are responsible for provision of basic services, including primary and secondary education, health and social services. Primary health care, a central feature of the Finnish health system, is provided through 237 ‘municipal health centres’. Municipalities can provide these services independently or in joint arrangements with neighbouring municipalities, and a small number have outsourced primary health care provision to NGO contractors (Vuorenkoski L, Mladovsky P et al. 2008). Historically, while secondary care is also a municipality function, it has been separated from primary health care and provided by hospital districts. Reforms over the last 10 years have aimed to enhance cooperation between primary and secondary care health services and social welfare services and integrate service provision into a single organisation (Vuorenkoski L, Wiili-Peltola E et al. 2007)

Germany

Germany does not have a strong primary health care system. Traditionally, GPs have not had a gate-keeping function: patients can directly access both primary and secondary care providers, making coordination and cooperation within and across sectors difficult (Schlette, Lisac et al.

2009). Since 2000, policy and legislative changes have supported new forms of care aimed at improve coordination and strengthening primary care. Legislation passed in 2004 permits new ways of organising care so as to foster better coordination and integration of care. Major reforms include integrated care contracts and disease management programs, the establishment of medical care centres (akin to polyclinics), GP gate-keeping and community medicine nurses (Blum 2007). The polyclinics are intended to co-locate GPs, medical specialists and increasingly non-physician practitioners under one roof (Blum 2007), and have been described as hospital type outpatient clinics (Hesse 2005). Their numbers have grown rapidly although the number of GPs working in polyclinics is still a small proportion (ie less than 5 per cent). A GP employment option is now available, but is are opposed by many self employed physicians (Blum 2007).

Netherlands

Primary care is a central feature of the Netherlands health system and family physicians are the gatekeepers to other parts of the health system. Since the 1970's there has been an increasing trend towards group practices and local health centres and a decline in solo practices. Practices and health centres may be staffed by multidisciplinary teams of family physicians, social workers, physiotherapists, sometimes midwives, and in rural areas, some practices also have their own pharmacies (Exter A, Hermans H et al. 2004). Little additional information in English was able to be obtained in the time frame for this review.

Spain

The Catalonian Government has a health innovation plan that proposes quite radical reform, including merging separate disintegrated primary care organisations into a single public enterprise to provide integrated primary health care services to populations of about 100,000. The focus is particularly on family doctors and nurses. The plan will require legislative changes to implement, and is unlikely to be passed, given the influential opposition of primary care doctors, many of whom also manage community hospitals and support vertical integration, and the lack of influence amongst the groups supporting horizontal integration (Badia 2008).

United Kingdom

Health systems in England, Northern Ireland, Scotland and Wales have taken different paths since the political devolution that followed the election of the Labour government in 1997. In England, community trusts were merged with Primary Care Trusts to better integrate primary and community health services (Imison C 2009), and health visitors, district nurses and other community health nurses have frequently been attached to general practices[3], although little is known about how well they are integrated. Health centres that house both general practices and community health services are common in Scotland (in Glasgow 50 per cent of general practices operate in this environment[4]), and increasingly so in Northern Ireland (Department of health social services and public safety 2005). Although the arrangements for co-location do not involve a single governing entity, they do provide some basis for integration and coordination of care through being housed under one roof.

Developments to better integrate primary health care in England started with 'Personal Medical Services' which were introduced in several waves from 1998. These services were the first major initiative that involved funding practices rather than individual GPs, giving practices greater freedom to develop flexible ways of working and supporting multidisciplinary approaches to address the health needs of their enroled population (McDonald J, Cumming J et al. 2006). The introduction in 2004 of practice-based capitation funding in the new General Medical Services contract has effectively given all practices the same level of flexibility, and the associated introduction of the Quality and Outcomes Framework (QOF) is also influencing the mix and range of services. However, beyond individual cases there is little indication that the core practice team has generally extended beyond GPs and nurses and that general practices could now be considered a form of integrated primary health care centre.

Three more recent initiatives are integrated care pilots, public/private partnerships to build new primary and community care facilities and the polyclinic initiative. The commissioning of 16 integrated care pilots (Department of Health 2008; Department of Health/Commissioning 2008) aims to address a range of different problems. The largest number involve integration of primary care with either community or hospital services (through partnerships approaches) to try and keep frail older people out of hospital (English Department of Health 2009). The Local Improvement Finance Trust (LIFT) was a public/private partnership scheme to support the building of new primary and community care facilities, including community-based health centres housing a variety of primary, community and secondary health care professionals (Imison, Naylor et al. 2008). While the scheme created new purpose built facilities where staff could be co-located, there appears to have been little integration.

[3] Personal communication, Helen Parker, Co-director Health Services Management Centre, University of Birmingham.
[4] Personal communication, Terry Findlay, formerly Lead Director, Glasgow City Community Health Care Partnerships.

In London, ten polyclinics are to be established, and many more are foreshadowed (Healthcare for London 2007). The main objectives are improving quality and access and reducing costs through primary health care integration. Some other polyclinics in England and Scotland are essentially hospital outpatient clinics, with little primary health care involvement (Finch 2008). In Scotland, polyclinics are known as community hospitals, and some are located in health centres. Commentary on polyclinics has tended to reflect various professional interests: with GPs emphasising the role of polyclinics in strengthening general practice integration with secondary and more specialist care, whilst nursing commentators have focused on bringing together primary, community health, social care and more specialist services (Drake, Hehir et al. 2008; Young 2008) and the opportunities for expanding nursing roles (Robinson 2008). The variety of names and services has led some commentators to call for the use of the term 'integrated health centres' (Finch 2008), especially as the association of polyclinics with former Soviet bloc countries in Central and Eastern Europe has given them a poor image (Ershova, Rider et al. 2007; Dixon 2008; Rechel and McKee 2008; Sharp 2009).

UNITED STATES OF AMERICA

Unlike Australia, Canada, England, and New Zealand, GPs in the US do not have a formal gate keeping function, except within some managed care plans. By the mid 1990s, one third of primary care practices were owned by hospitals, multi-specialty clinics, health plans or other large organisations, such as Managed Care Organisations, with the major focus for integration on linking primary care physician practices with specialist services through purchasing, merging or building integrated facilities (Coddington, Moore et al. 1996). Kaiser Permanente, a major Managed Care Organisation operating in a number of states is an example of an integrated system that provides primary, secondary and tertiary health care services. It has created a strong primary health care base by developing integrated multidisciplinary primary health care teams (Roblin, Vogt et al. 2003).

The other major model of integrated primary health care is **federally funded health centres** which serve a range of disadvantaged communities and populations. These have been in existence since the early 1970s and have continued to expand under both the Bush and Obama regimes, with funding for 126 new centres recently announced as part of the economic stimulus package (US Department of Health and Human Services 2009).

METHODS

This was a rapid narrative systematic review, with the same steps as a full systematic review (defining questions, determining search terms, appraisal of literature, data extraction, analysis and synthesis), but with fewer steps to ensure that each step was fully systematic (Watt, Cameron et al. 2008).

The questions addressed in the review are:

1. Which countries have integrated primary health care centres (or polyclinics) as a feature of their primary health care system? What are the characteristics of these services?
2. What evidence is there about the effectiveness of such services?
3. How applicable are these results to the Australian context?

For the purposes of this study we used the term 'integrated primary health care centre' as a general term that includes polyclinics. The essential characteristics of an integrated primary health care centre are shown in Box 1.

BOX 1

Integrated primary health care centres

- Discrete service provider organisations (not systems or networks)
- Involving primary medical care (provided by doctors or nurses) with at least two other health professions
- With a single governance structure
- With systems (such as shared records) and structures (such as team meetings) to support integration of care
- Providing multi-disciplinary primary health care (possibly in addition to specialist or secondary care)
- A recognised part of their countries' primary health care system (time limited trials or one-offs only considered for the effectiveness analysis (question 2))
- Within a country with economic and social structures and primary health care system similar to Australia: (Canada, New Zealand, the UK, the US and countries in Western Europe).

The review drew on published literature, consultations with key informants and the previous knowledge of the authors. These methods are summarised in Box 2, with more details (including a list of key informants) in Appendix 2.

BOX 2

Black (peer reviewed) literature

Searches of MEDLINE, EMBASE and CINAHL using a range of terms relating to *primary health care*, *integration*, *multi-disciplinary* and *service* or *centre* (see Appendix 2 for a full list), and snowballing from articles

- Relating to included countries and published in English since 1999

Grey literature (non-peer reviewed reports and reviews)

- Identified through Google and Google Scholar, a search of relevant web sites and suggestions from key informants (see Appendix 2.

Key informants (see Appendix 2 for list)

- Identified from the research team's previous contacts in Australia, New Zealand, Canada, UK, Finland and the US.
- Asked initially to help identify literature and provide information about integrated primary health care centres in their countries, and subsequently for comments on material in the report.

The next section describes the different models of integrated primary health care centre that were found, followed by an analysis of the evidence for their effectiveness.

COUNTRIES WITH INTEGRATED PRIMARY HEALTH CARE CENTRES, AND THEIR CHARACTERISTICS

This section addresses the first review question. Integrated primary health care centres form a recognised part of primary health care in Canada, New Zealand, England and the US and Finland, and to a lesser extent in other parts of Western Europe. Across these countries we found fourteen different models that fell into three broad types:

1. Extended General Practice models: These are essentially general practices whose range of providers and services has been developed to the point where they can be said to be offering multi-disciplinary primary health rather than just primary medical care. However primary medical care (which may be delivered by doctors or nurses) remains the core of the service, and GPs usually take the leading role. Some of these models include some secondary and specialist as well as primary health care services (including shifted outpatients), but they are built around a core of integrated primary health care.
2. Broader Primary Health Care Centre models: Although these services offer primary medical care, they have a broader primary health care focus, and usually address the needs of a disadvantaged community or group. They tend to have a stronger focus on prevention and the social determinants of health than Extended General Practices.
3. Centres with a strong focus on secondary care: These may include medical specialists or specialist teams and shifted hospital outpatient services. Although they provide some primary health care, the focus tends to be on integration of general practice with secondary care rather than within primary health care.

Table 1 shows the fourteen models of integrated primary health care centre organized by type. Centres that are not recognised as core parts of the primary health care system in their country are not included. A description of each model is presented in Appendix 2.

TABLE 1: TYPES OF INTEGRATED PRIMARY HEALTH CARE CENTRES BY COUNTRY

Country	Extended General Practice	Broader PHC Centres	Secondary Care Focus Centres
Australia	HealthOne NSW (NSW) GP Plus (SA) GP Super Clinics (National)	GPs in CHCs (Vic) ACCHS (all jurisdictions)	
Canada	Family Health Teams (Ontario)	Community Health Centres (all jurisdictions)	
Finland		Municipal health centres	
Germany			Polyclinics
New Zealand		Community Controlled PHC Centres	
England	PMS (England) Polyclinics (London initially, then more broadly)		Polyclinics (some)
US	Kaiser Permanente PHC Teams (3 states)	Federally Qualified Community Health Centers (All states)	

Extended General Practice models were the most common, and these were found chiefly in countries where general practice forms the core of primary care. All of the Australian and English models are built around existing private general practice, whose capacity and range of service have gradually been enhanced by public funding for new types of service or through closer integration with other parts of the primary health care system[5]. In New Zealand, Primary Health Organisations rather than Extended General Practices have been used to provide access to a wider range of primary health care. In the US, where general practice is not so central to the health system, Kaiser Permanente's integrated primary health care teams have been specifically developed to meet primary health care needs within that particular health system. Although many of these models are still under development, they are all intended to become core parts of generalist primary health care within their systems.

Broader primary health care models, by contrast, are generally designed for under-served populations or groups with particular needs. Although many of these are well established, they are not intended to operate across the general population. The particular focus of each of these models reflects the needs of its country: Indigenous and ethnic groups in Australia and New Zealand, and low income groups in Canada and the un- or under-insured in the US. The

[5] Some GP practices are also moving towards an integrated primary health care model, especially with the inclusion of differing nurse roles and functions and a broadening of their scope of primary health care services and approaches. See for example Grant, S., et al. (2009). "The impact of pay-for-performance on professional boundaries in UK general practice: an ethnographic study." Sociology of Health & Illness 31(2): 229-245.

exception is Finland where comprehensive primary healthcare services are a central plank of basic services provided by municipalities for their local populations.

Centres with a secondary care focus are much less common, but at least one English Polyclinic (Finch 2008) and a number of German centres (Imison, Naylor et al. 2008) take this form. Their focus on specialist care and services shifted out of hospitals reflects a concern for vertical rather than horizontal integration. They are dominated by medical staff and it appears that few other primary or community health related staff or services are involved.

Tables 2-4 set out the main characteristics of each of these models of integrated primary health care centre, with a summary of each type of centre. Box 3 explains the column headings used in these tables.

BOX 3: DIMENSIONS OF INTEGRATED PRIMARY HEALTH CARE CENTRES

Structure[6]	**Co-located**: all service providers operating from a single centre. **Hub and spoke**: a central set of services (hub) provides support to a number of front line primary health care centres (spokes).
Orientation	**Professionally oriented:** focusing on providing professional services to individual patients who present to the centre, which is usually GP-led. **Community oriented:** also includes a focus on improving the health of a defined population, usually with public involvement in governance (Lamarche, Beaulieu et al. 2003).
Sector	This relates to the ownership and governance of the service. Options are: **Private**: either a small business or corporate entity. **Public**: public sector organisation, including a government authority. **Non government organisation (NGO):** not for profit/charitable entity. Note: The sector type does not reflect the origin of funding, which is often from the public purse.
Equity focus	This relates to whether a centre focuses particularly on the needs of a community or population with poor health status, unmet service needs and/or needs for culturally specific health care.
Funding	**FFS**: fee for service. **Capitation**: a fixed payment to the centre for providing health care to an enroled patient, irrespective of the actual services provided. **Block funding**: a defined budget for the service. **Quality payments:** bonus payments for meeting defined quality criteria.
Core staff	This relates to the expected mix of staffing for a particular model. The actual mix may vary across centres.
Patient enrolment	The centre has an identified set of patients for whom it is responsible for providing primary health care services. Patients may enrol with the centre or with a particular clinician, and clients may or may not be able also to access services from other primary health care services.

[6] The structure does not necessarily reflect the degree of integration: services can be co-located, but not integrated; or not co-located, but integrated; or both co-located and integrated.

Target population	The centre is responsible for ensuring the primary health care needs of an identified population are met, whether or not they are current clients of the service. This may include geographically defined populations or groups with special needs.

LE 2: EXTENDED GENERAL PRACTICE MODELS

l	Structure	Orientation	Sector	Equity focus?	Funding	Core staff	Patient Enrolment
nOne alia,	Mostly co-located Some hub/spoke	Professional (private/public)	Private (GPs), public (nursing, AHS), Some NGO	No	Hub: fixed budget + FFS Spoke: FFS	GP, practice and community nurse, allied health	No
us alia, SA)	Hub/spoke	Professional (private/public)	Private spoke Public hub	No	Hub: fixed budget + FFS Spoke: FFS	Hub: allied health, nursing. Spoke: GP and practice nurse	No
per Clinics alia)	Co-located	Professional (private/public)	Mostly private	No	FFS	GP, practice nurse, allied health	No
y health (Canada, o)	Hub/spoke	Professional community/mixed	Private	No	Capitation + FFS	Hub: allied health, nursing (NP, RNs) Spoke: general practice, nursing (NP, RNs)	Yes
England)	Co-located	Professional (private under contract to government)	Private	PMS only	Capitation + quality payments	GPs, nursing teams	Yes
nic and)	Co-located Hub/spoke	Professional	Unsure	No		GPs, nursing teams, allied health	Yes
anente	Co-located	Professional	Not for profit	No	Capitation +	GPs, nurses (NPs, RNs), medical assistants,	Yes

l	Structure	Orientation	Sector	Equity focus?	Funding	Core staff	Patient Enrolment
eams (US)					FFS (?)	pharmacists, +/ specialists	

Many of these models involve co-location, which often reflects the fact that they have developed on the base of individual practices. Others are hub and spoke organisations, in which a number of 'spoke' general practices are supported by a 'hub' of other service providers who may operate from a central location or visit the practices to provide services. Extended General Practice services involve general medical and/or nurse practitioners, practice and/and community nurses and a range of allied health staff, with some centres including other more specialised services (including medical specialists), and in some cases social care (especially services for older people).

Clinicians may be part of a single organisation or they may come from a number of different services in the private, public and non-government sectors. In hub and spoke centres, general practices are usually private and the supporting 'hub' services often public, while co-located centres may include directly employed staff alongside private practitioners or clinicians seconded from other services. Other specialised teams may visit the centre and provide services on an occasional basis. These hybrid arrangements create particular challenges for integrated governance and sharing information and other support systems. The literature was often unclear about the extent to which centres were genuinely integrated, rather than simply co-located or networked as in a hub and spoke structure.

The English, Kaiser Permanente and Canadian Extended General Practice models involve patient registration, which is not found in Australia. None of the Extended General Practice models has responsibility for the health of a broader community or population. This is consistent with their lack of focus on equity[7] and their professional rather than community orientation.

Funding arrangements reflect the health system and the way in which clinicians are engaged (eg employed or independent practitioners). All the centres have some fee for service, and all countries except Australia also have capitation payments. Public sector elements of Extended General Practice services tend to be paid from fixed budgets. These different funding arrangements tend to support different ways of working and create different incentives, which may need careful balancing. Funding arrangements may also differ in the scope they allow for multidisciplinary team care and for flexibility in the way services are delivered.

[7] General practice under the Personal Medical Service contract in the England is the exception.

LE 3: BROADER PRIMARY HEALTH CARE MODELS

l	Structure	Orientation	Sector	Equity focus?	Funding	Core staff	Patient enrolmer
CHCs alia)	Co-located	Community	NGO	Yes	FFS for GPs, fixed budget for CHC	GPs, nurses, allied health, health workers, other	No
S alia)	Co-located	Community	NGO	Yes	FFS for GPs and some nursing and AHP, fixed budget for other staff	GPs, nurses, allied health, health workers, (depending on size)	No
(Canada)	Co-located	Community	NGO, public	Yes	Fixed budget	GPs, nurses (NPs, RNs), allied health, health workers, other	No
ipal health es nd)	Co-located	Community	Public, NGO	No	Fixed budget	GPs, dentists, various nursing disciplines, allied health professionals	No
unity lled PHC s (New nd)	Co-located	Community	NGO	Yes	Capitation and FFS	GPs, nurses, allied health, health workers, , other	Unsure
(US)	Co-located	Community	Public and not for profit private	Yes	Fixed budget	GPs, nurses (PNs, RNs), allied health, health workers, other	No

BROADER PRIMARY HEALTH CARE MODELS

With one exception (Finland), Broader Primary Health Care Centres were established to meet the needs of communities or groups with particular health needs: for example the Aboriginal Community Controlled Health Services in Australia for the Indigenous groups and the Community Health Centres in the US and Canada for the lower socio-economic communities with low levels of health insurance. In Finland, however, municipal health centres serve the whole local population, with primary medical care an integral part of these services.

These models are co-located rather than hub and spoke. While they have primary medical services, their focus is on community as well as individual health issues and addressing the social determinants of health. They tend to have a broader range of staff, including allied health professionals, community workers and educators. These models are more likely to serve a defined population rather than formally enrol individual patients, and they have an explicit focus on equity. They also tend to have a stronger community orientation than Extended General Practice models, often including significant community involvement in their governance.

Like Extended General Practices, these models often have a mix of different types of funding: for example the Aboriginal Community Controlled Health Services have a fixed budget for their core operations, draw on Medicare for general practice and some Aboriginal Health Worker activities, and often also have specific purpose funding for projects.

LE 4: SECONDARY CARE FOCUS MODELS

l	Structure	Orientation	Sector	Equity focus?	Funding	Core staff	Patient enrolmer
nic and)	Co-located Hub and spoke	Professional	Public/private	No	Unsure	GP, specialist and outpatient staff	Only PC
nic any)	Co-located	Professional	Private	No	Unsure	Medical specialists, physicians GPs, allied health (not stated)	Not known

SECONDARY CARE FOCUS MODELS

Models with a secondary care focus involve specialist clinicians and services. Some of these may have been shifted from a hospital to a community base (eg England), while others may have been brought together from dispersed offices to shared premises (eg Polikum in Germany). These centres involve primary medical and possibly more extended primary health care, but the emphasis is on integration with secondary and specialist services rather than within primary health care, and on referral to specialist services rather than strengthening primary health care.

THE EFFECTIVENESS OF INTEGRATED PRIMARY HEALTH CARE CENTRES

This section addresses the second question of the review.

We found 38 papers (from black and grey literature) that provided evidence for the effectiveness of integrated primary health care centres. Most of these were from program evaluations from Canada, England, New Zealand and Australia and from a series of studies of Community Health Centres in the US. A full list of the papers is found in Appendix 3, with country, type of integrated primary health care centre and model, together with the study design they used.

Tables 5-8 show the health system/service, quality of care, health and economic outcomes reported for each model of integrated primary health centre, together with the levels of evidence in each study. These levels are taken from (Curran 2004).

BOX 4

Levels of evidence

1 Informed opinion articles: Includes editorials and letters without original data. Often cite information from other published data. Includes non-systematic reviews without rigorous methodology. These articles contain the least valid evidence

2 Descriptive studies: These are original works but do not compare interventions. Includes surveys and case studies

3 Quasi-comparative studies: Original studies comparing outcomes of different interventions but without controlling for the interventions in the study

4 Comparative studies: The study controls the interventions as with a controlled trial. Includes cross-sectional, case-control, cohort, pre/post-test, clinical trials and systematic reviews.

Health system/service outcomes include changes to patterns of health service provision, access and use of services, within the integrated primary health care centres or in other services. Care should be taken in generalising from these results, which relate directly only to the model from which they are derived. They do, however, indicate something of what can be achieved through integrated primary health care centres, depending upon their context and characteristics.

TABLE 5: HEALTH SYSTEM/SERVICE OUTCOMES

Model and Country	Outcome reported	Reference (level of evidence)
(a) Patterns of health service provision		
PMS (England)	Limited integration with other organisations. Increased flexibility in range and mix of services and in roles and functions of GPs and nurses. Pilots have negotiated a new doctor–nurse relationship within primary care and with hospital colleagues. However, lack of support from nursing professional bodies perceived as a barrier. The impact of salaried GP contracts: successfully addressing lack of GPs in deprived areas; a better match between workers and their jobs; modest but positive effect on recruitment, retention, work effort, and quality of care. With its quality orientation and local responsiveness, PMS created a framework within which the quality of primary care can improve.	(Walsh, Andre et al. 2002; Riley, Harding et al. 2003) (3;2) (Leese B and Petchley R 2003) (2) (Lewis 2001) (2) (Sibbald, Petchey et al. 2002) (3) (de Lusignan S, Shaw A et al. undated)
CHCs (Canada)	Only modest results in achieving interdisciplinary collaboration: most collaboration multidisciplinary or parallel practice by team members. Longer consultations in CHCs translate into better care. While health promotion was significantly higher in CHCs than other PHC models, the model type did not independently predict health promotion activity.	(Sicotte, D'Amour et al. 2002) (2) (Russell, Dahrouge et al. 2009) (3) (Hogg, Dahrouge et al. 2009) (3)
GPs in CHCs (Australia)	GPs in CHCs more likely to refer to allied health professionals and work in collaboration with other team members compared to private GPs. There is no preferred model for GP engagement – both salaried and private practice co-location models can achieve comparable outcomes and break even financial performance.	(Burgell Consulting Pty Ltd, O'Leary & Associates et al. 2002) (2)
(b) Access		
PMS (England)	Integrated services to the homeless/rough sleepers and provided PHC to a marginalized group in a deprived area. Optimised flu	(Leese B and Petchley R 2003) (2)

Model and Country	Outcome reported	Reference (level of evidence)
	vaccination, developed services in an area that would not otherwise have them, developed substance misuse and mental health services, and provided female GP services to female homeless patients. A level of satisfaction across the sample of PMS sites was generally high; vulnerable clients (eg homeless people expressed gratitude to the service they had accessed).	(Carter, Curtis et al. 2002) (3)
GPs in CHCs (Australia)	GPs in CHCs more likely to see clients with complex, mental health, D&A problems and women from disadvantaged backgrounds.	(Burgell Consulting Pty Ltd, O'Leary & Associates et al. 2002) (2)
Third-Sector (New Zealand)	Serving a poor, largely non-European population.	(Crampton, Davis et al. 2004) (3)
Third Sector (New Zealand)	Reduced financial and cultural barriers to access compared to general practice.	(Crampton, Davis et al. 2005b) (3)
CHCs (US)	Among uninsured patients, those using CHCs report more positive experiences about access, having a regular source of care and comprehensive care. Patients from CHCs who were affiliated with a medical school or hospital had less difficulty than those with no affiliations to find a provider when referred to medical specialists and treatment facilities.	(Shi and Stevens 2007) (3) (Cook, S Hicks et al. 2007) (2&3)
CHCs (US)	Low-income residents of areas with greater number of health centres per low income resident more likely to have visited a physician, regardless of insurance status.	(Brown, Davidson et al. 2004) (2)
(c) Use of services		
PMS (England)	Proved popular with vulnerable populations, often poorly served by general practice—raising ethical concerns regarding potential development of a two-tier service–with the disadvantaged receiving their care from nurses and the mainstream population from doctors.	(Lewis 2001) (2)
CHCs (US)	Among uninsured patients, those using CHCs much less likely to delay seeking care because of costs, go without needed care, or fail to fill	(Shi and Stevens 2007) (3) (Forrest and Whelan 2000; Politzer, Yoon et al. 2001) (3,

Model and Country	Outcome reported	Reference (level of evidence)
	prescriptions. Significantly lower rates of hospitalization and visits to Emergency Departments for ambulatory sensitive conditions by Medicaid beneficiaries using or living close to a health center.	2&3) (Epstein 2001; Falik, Needleman et al. 2001; Hadley and Cunningham 2004; Falik, Needleman et al. 2006; Rust, Baltrus et al. 2009) (2&3, 2, 2&3, 2&3)
Community controlled PHC (New Zealand)	Utilisation rates lower than in fee for service practices, especially for young children.	(Crampton, Dowell et al. 2000) (2)

All the evidence on health system and health service outcomes comes from Broader Primary Health Care centres, except for some data from Personal Medical Services in England.

The findings on patterns of health service provision are mixed. Personal Medical Services are reported to have achieved greater internal flexibility in the way they provide services but only limited external integration with other services. While only limited integration and interdisciplinary collaboration were also found in community health centres in Canada, GPs in Australian community health centres were more likely to collaborate with allied health providers than their private sector colleagues. However, other evaluation findings about this latter program indicate that the GP services remain relatively unintegrated with other services within the community health centre (Burgell Consulting Pty Ltd, O'Leary & Associates et al. 2002). Other indications of different patterns of service provision include longer consultations and a trend towards more health promotion in Canadian Community Health Centres.

There is better evidence about access to services. There is evidence that some models (New Zealand community controlled primary health care services and Victorian Community Health Centres which have GPs) are indeed serving the disadvantaged groups for which they were established, with reduced financial and cultural barriers for those using the New Zealand services. Clients of US community health centres reported better access to comprehensive and continuous care than those using other services. US community health centres were also able to show improvements in access to and use of services at a population level.

Changes in use of services are reported from the US and New Zealand. The lower utilisation rates in 'Third Sector' (not-for-profit) organisations in New Zealand are equivocal: this may reflect better preventive or community care, the availability of subsidies for young children in mainstream general practice or an under-utilisation of services. Indications of improved use of services in US community health centres include fewer people missing needed care and reduced hospitalisation and use of Emergency Departments for ambulatory sensitive conditions.

TABLE 6: QUALITY OF CARE OUTCOMES

Model and Country	Outcome reported	Reference/levels of evidence
Kaiser Permanente (US)	Sustained/improved patient satisfaction, quality of care where levels of integration achieved.	(Roblin, Vogt et al. 2003)
PMS (England)	Improved services for disadvantaged patients. PMS pilots made significantly greater improvement than GMS practices in their overall quality of care for older patients, in the area of angina and in developing protocols and procedures for mental health care.	(Walsh, Andre et al. 2002; Riley, Harding et al. 2003) (3,2) (Leese B and Petchley R 2003) (2) (Steiner, Campbell et al. 2002) (4) (Campbell, Steiner et al. 2005) (4)
CHCs (US)	Among uninsured patients, those using CHCs: - report more positive experiences about having a regular source of care and comprehensive care. - much less likely to delay seeking care because of costs, go without needed care, or fail to fill prescriptions.	(Shi and Stevens 2007) (3) (Forrest and Whelan 2000; Politzer, Yoon et al. 2001) (3,2&3)
CHCs (US)	Higher rates of preventive screening and vaccination compared to uninsured non-users; screening rates exceed national standards, especially for cancer screening.	(Regan, Lefkowitz et al. 1999; Carlson, Eden et al. 2001; Frick and Regan 2001; Hicks, O'Malley et al. 2006; Shi and Stevens 2007; Shi, Stevens et al. 2007). (3,2&3,2,3,3,3)
CHCs (US)	Higher process of care measures for diabetes compared to uninsured patients receiving care in other settings.	(Ulmer, Lewis-Idema et al. 2000; Eisert, Mehler et al. 2008) (2,2)

General improvements in quality of care are reported from Kaiser Permanente and community health centres in the US and from Personal Medical Services in the England (for disadvantaged patients). In Kaiser Permanente the improvements depended upon levels of integration, while the improvements for disadvantaged patients in the Personal Medical Services are consistent with the improvement in quality of care noted earlier.

The community health centres in the US also showed improved care in more specific areas: screening, vaccination and diabetes care. The recent finding of improved quality of care for diabetes (2008) follows an earlier finding(2000) that profiles of patients using community health centres did not meet national diabetes indicator standards (Chin, Auerbach et al. 2000), and may reflect the success of community health centres in conducting programs which achieved significant improvements in diabetes indicators, including HbA1C and cholesterol levels, and care processes including assessment and screening rates (Chin, Cook et al. 2004; Shin, Markus

et al. 2006; Chin, Drum et al. 2007; Coleman, Reiter et al. 2007; Huang, Zhang et al. 2007; Shin, Markus et al. 2008).

The review found fewer studies reporting health outcomes for integrated primary health care centres. These are shown in Table 7.

TABLE 7: HEALTH OUTCOMES

Model and Country	Outcome reported	Reference/levels of evidence
CHCs (US)	Trend for women receiving antenatal care through CHC to have a lower incidence of very-low and low birth weight babies compared to other providers or their counterparts nationally.	(Politzer, Yoon et al. 2001; Shi, Stevens et al. 2004; Haq 2007) (2&3,2,2)
CHCs (US)	No significant racial and ethnic health disparities amongst CHC users, unlike general population (after controlling for socio-demographic factors).	(Shi, Regan et al. 2001) (3)
CHCs (US)	Reduced gap between white and non-white population for infant mortality, prenatal care, TB case rates, & age adjusted death rates.	(Shin, Jones et al. 2003) (2&3)

Health outcomes were reported only for community health centres in the US. One group of studies showed that women attending community health centres for antenatal care had fewer low and very low birth weight babies than comparison groups. The other studies considered equity related health outcomes, and showed that the centres had succeeded in reducing or removing ethic and racial gaps in health outcomes for a range of conditions. This is directly related to the centres' aim of addressing the health needs of disadvantaged groups.

Table 8 shows economic outcomes reported in the literature.

TABLE 8: ECONOMIC OUTCOMES

Model and Country	Outcome reported	Reference/levels of evidence
CHCs (US)	Lower cost for CHC users than non-users (controlling for age and disability status). Health centers saved Michigan a total of $17.8 million over 1 year	(McRae and Stampfly 2006). (2&3)
CHCs (US)	HDC[8] cost effective in improving chronic disease care in CHCs	(Huang, Zhang et al. 2007) (2)

Once again, there were economic outcome data only for community health centres in the US. These showed that it was cheaper to provide health care through community health centres than through alternative options. There was also evidence that cost effective programs to improve the quality of care could be run through these centres, suggesting the potential for further targeted programs to improve quality and reduce costs.

[8] Health Disparities Collective: a program to improve chronic disease care in Community Health Centres.

DISCUSSION

This review found evidence of integrated primary health care centres in a number of countries, but in many cases limited details of the models used. Most of the evidence about the effectiveness of centres came from the US, where standard data sets have allowed quite extensive evaluation, including the reach and impact at population level. Elsewhere there was much less information, with particularly little about Extended General Practice models. The evidence came from a range of study types including surveys case studies and evaluations, with important groups of studies from Canada and the US.

We found three main types of models integrated primary health care centres, varying in their purposes, structures and strengths.

Broader Primary Health Care centres are generally established for particular groups whose health needs are not met by mainstream primary health care services. Not surprisingly, they tend to have a strong focus on equity, and advocating for their constituents may be an important part of their role. They are found in the non-government or public sectors and often have significant community involvement in their governance. They are more likely to address community rather than just individual health needs and to have a defined population to serve rather than individually enroled patients. Their focus on the social determinants of health influences their staffing, which commonly includes a mix of health professionals from a variety of professional and disciplinary backgrounds, as well as social, welfare and community workers. For some models there is evidence of reaching their target groups, improving equity and quality of care and in some cases health outcomes.

Extended General Practice services tended to be directed towards the whole population. They are usually professionally rather than community oriented (Pineault, Levesque et al. 2008), may have registered patients rather than a defined population to serve and tend to be in the private rather than public sector, although their funding typically comes from the public purse. This reflects current arrangements for mainstream primary care, reinforcing the idea that integrated primary health care centres are an evolutionary development, with services adding a broader range of health professions and disciplines to a core team of GPs and nurses. Many of these Extended General Practice models are recent developments with much less evidence about their effectiveness, although in Kaiser Permanente centres improved integration was associated with sustained/improved patient satisfaction and quality of care.

While Extended General Practice services may include strong links with specialist and secondary care, their main focus is on integrated primary health care. Vertically Oriented Services by contrast have a main focus on specialist care, with some limited provision for general practice. This model was most common in Germany, where general practice has traditionally had a more limited role than in Australia and may not be strong enough to provide a basis for Extended General Practice services. Where English polyclinics took this form, this appeared to reflect a local need for a community base for specialist services.

The first two main types of integrated primary health care centres complement each other, with Broader Primary Health Care services typically addressing the needs of groups not well served by traditional or extended general practice. However the two types are not entirely separate: people served by Broader Primary Health Care services may also use general practice, and it might be thought better to support general practice to meet the particular needs of these groups rather than having dedicated services for them. However, this ignores the particular strengths of Broader Primary Health Care services, with their stronger links to the community

and their focus on advocacy and the social determinants of health. Australia's plural system allows the benefits of both types while giving individuals the choice about where they access their primary health care.

Staff in Broader Primary Health Care centres were predominantly co-located, while Extended General Practice services had both hub and spoke and co-located structures. There was no evidence about the relative effectiveness of these. However hub and spoke arrangements fit well with Australian general practice. They can provide specialised support services to existing practices without requiring them to move into new premises or adopt radically new business models. A critical mass of support services can be concentrated in one place, rather than spread across a large number of separate practices. They also avoid the dangers of reducing public access by co-locating practices in a few large centres and of creating unfair competition between practices based on their allocation of allied health staff. However, it remains a challenge to develop models of care and governance arrangements which allow the service to go beyond being a referral network and to provide genuinely integrated multidisciplinary care. This is particularly difficult where, as in Australia, the hub and spoke come from different sectors and parts of the health care system.

In co-located services, clinicians have the advantage of daily contact with each other, which may make it easier to integrate care. However, this cannot be taken for granted: integration can also be a significant problem in co-located centres, where clinical groups may continue to operate more or less independently. This is a particular danger in a system like Australia's where there is such variety across different parts of primary health care in professional leadership, mode of payment and approach to patient care. In the absence of evidence about comparative effectiveness, the choice of structure should perhaps reflect local circumstances, as is currently happening within the HealthOne NSW program.

The public response to integrated primary health care services appears to be concerned particularly about access, integration and continuity of care. There is support for the idea of more integrated and comprehensive services, but in England there has also been concern about loss of access, particularly for rural areas and about maintaining continuity of care in larger centres (Imison, Naylor et al. 2008). There is clearly a balance to be struck here, with services large enough to be comprehensive but remaining close to their community. In the US, there was appreciation of the regular and comprehensive care available through community health centres. While this may reflect the particular problems that un- or under-insured Americans face in accessing health care, it also highlights the opportunity for Broader Primary Health Care centres to address the particular needs of their constituency.

Clinicians' response to the idea of integrated primary health care services varies and seems to follow their professional background. In England, doctors have been concerned about loss of control in polyclinics (Dixon 2008; Higson 2008; Holmes and Holmes 2008), but nurses have been positive about the potential for role expansion and horizontal integration (Drake, Hehir et al. 2008; Robinson 2008; Young 2008). The move to more integrated primary health care can challenge existing professional roles, creating a need for skilled leadership and change management. However, there was also strong appreciation of the quality of facilities that came with purpose build health centres (Imison, Naylor et al. 2008).

Although this review has focused on integration within single centres or services, this is not the only way ahead. Integrated care depends upon coordination at many levels, from funding and service development through to service provision, and many individuals need their care coordinated across centres as well as within them. This requires integration between centres or

services and within the health care system as a whole. In Australia, Primary Care Organisations can play an important role. These are higher level organisations like English Primary Care Trusts or New Zealand Primary Health Organisations, with responsibility and authority for coordination across primary health care. They can integrate arrangements for care across networks of services, often through the use of contracts, funding agreements or direct service planning and providing shared systems to support communication and information sharing[9]. The lack of such organisations in Australia makes these tasks more difficult.

Finally, too strong a focus on the structures can distract attention from the processes such as teamwork and communication that produce integrated care[10], and for which integrated organisational structures may be neither necessary nor sufficient. The evidence is mixed here, with increased flexibility of roles in Personal Medical Services in England (Riley, Harding et al. 2003) but only limited interdisciplinary collaboration in Canadian community health centres (Sicotte, D'Amour et al. 2002). The experience of developing polyclinics in London suggests that process is particularly important (Imison, Naylor et al. 2008). Critical factors include the following

- **a bottom up, clinician led development process:** A lack of clinician engagement in shaping and developing service models that meet their local patient population needs as well as providing them with benefits, can undermine commitment and participation. (O'Dowd 2008)
- **balancing the range of professional interests**: Commentary on polyclinics is defined along professional lines. GP commentators stress the benefits of improved integration with their specialised medical colleagues (Dixon 2008), whereas nurses highlight the opportunities for improved integration across the range of primary health care providers afforded by the polyclinic model (Robinson 2008). This highlights the need for an inclusive approach to clinician leadership
- **investment in team development and change management:** Multidisciplinary team approaches require significant changes to work practices and relationships between differing professional groups (McDonald, Harris et al. 2008). Numerous evaluations of efforts to develop more collaborative practice have found that dedicated resources, effort and time are required for a team culture to develop and for integration to move beyond referral linkages amongst even co-located services, which is not a proxy for integration (Walsh, Andre et al. 2002; Shaw, de Lusignan et al. 2005; Beaulieu, Denis et al. 2006; Imison, Naylor et al. 2008)
- **ongoing support for service delivery partnerships:** Political support is required at all levels of the health system for the achievement of integration. This support is needed over time (Berridge 2008; Imison, Naylor et al. 2008)
- **effective community engagement:** Service users as well as local stakeholders make a vital contribution to the initial and ongoing development of locally responsive and appropriate integrated services (Imison, Naylor et al. 2008). Engagement with other local service providers is essential for ensuring new integrated services are not developed in isolation from other local primary and secondary care services (Sanders 2009).

[9] In England, the patient lists of general practices are sometimes used to define the target group of (independently operating) community health centres and so link the work of the two.

[10] In England, one criticism of Polyclinics has been that attention has been paid to the facilities and the organisations at the expense of teamwork and models of care – see Imison, C., C. Naylor, et al. (2008). "Under One Roof : Will polyclinics deliver integrated care?" London, UK, King's Fund.

IMPLICATIONS FOR AUSTRALIA

This section addresses the third and final question of the review.

Australia has been working to improve the integration of primary health care for a number of years. This is supported by evidence about the benefits of a strong primary health care sector and the importance of core components such as multidisciplinary care (World Health Organisation 2008). However, the evidence for existing models of integrated primary health care centres is still limited. It is therefore important to proceed cautiously and to evaluate services and their impacts on primary health care provision, without assuming that these are necessary or sufficient for achieving more integrated primary health care.

There will need to be a balance between the two main types of integrated primary health care centres. Some existing Broader Primary Health Care models are well established, especially GPs in community health services and Aboriginal Community Controlled Health Services, while current initiatives focus largely on Extended General Practice services. While these are appropriate for mainstream primary health care provision, it will be important to remember their limitations, in particular the lack of explicit focus on equity, health problems in the community and social determinants of health; the lack of community involvement in their governance; and, in Australia, the disadvantage of having no system of patient registration to identify the group of clients for whose care they are responsible. It should also be noted that current initiatives are not all the same: the state funded programs (HealthOne NSW and GP Plus) focus more on involving community health: this brings in a wider range of primary health care providers who have wider networks of relationships with other services, but also a more troubled history of integration with general practice than do private allied health providers, who play a larger role in GP Super Clinics.

There is a choice between co-located or hub and spoke models. In the absence of convincing evidence for either, this is largely a matter of which best fits local circumstances. Hub and spoke models may be better for achieving a broad reach, particularly in urban areas, as the 'hub' can service a large number of 'spoke' general practices. The fact that both structures are currently being developed creates an opportunity for a comparative evaluation of the two.

The development of integrated primary health care centres may be seen as a logical 'next step', but overseas evidence and Australian experience shows that it will not be an entirely easy one, particularly given the long history of fragmentation in Australian primary health care. There will need to be a serious commitment to consultation, community engagement and service development, and each of the four areas identified at the beginning of this report will need strengthening.

More work will be needed for models of care. While the coordinated care trials have shown the value of designated care coordinators, a stepped approach is probably needed, ranging from simple referral and self-management support for those most able to manage their care to case management for those with the most complex needs. This requires a much better understanding of the needs of patients, and it will be important to measure the impact of these changes on patient outcomes. The development of collaborative protocols can be an effective way of developing practical teamwork and models of care (Beaulieu, Denis et al. 2006).

More work is also needed on how to ensure that the models of care have an appropriate focus on prevention and early intervention. This is likely to take a different form in Enhanced General

Practice Care and Broader Primary Health Care centres, as the former have broad reach to individuals in the general community and the latter greater scope to address health problems in their designated communities.

We do not yet have the organisational structures required for financial and clinical management and overall governance. These will have to accommodate the interests of professionals from different sectors and services, and also to ensure that the public interest is served and that there is a public voice in governance. This is likely to be contested territory: witness varying professional responses to the idea of polyclinics in England. This may be particularly acute in co-located models, but will also apply to hub and spoke models.

In terms of funding arrangements, existing services have shown that it is possible, with some ingenuity, to provide some types of multidisciplinary care under existing funding arrangements. However, much more flexible arrangements will be needed if integrated primary health care centres are to become the core of primary health care. These arrangements will need to direct services towards population needs and reward quality, and at the same time allow them the scope to decide how best to organise care and meet the needs of their client population[11]. This is likely to involve a mixed funding model with some capitation and some fee for service payments, although the lack of any system of patient registration in Australia makes this more difficult to achieve.

The movement towards more integrated primary health care will need a firm political base to allow reform across the entire system and to reassure clinicians that it is safe to invest their professional lives and, in some cases, their equity in this form of primary health care. It remains to be seen how far this is achieved through current health care reforms.

Finally, a move to integrated primary health care services will need ongoing monitoring and evaluation. This will be needed in all areas: the structures used to bring the different professions together, the models of care, teamwork and integration, access and reach, and the impact on quality of care and health outcomes.

[11] The English General Medical Services contract is a useful model of this combination of flexibility and accountability.

APPENDIX 1: SUMMARY DESCRIPTION OF MODELS BY COUNTRY

AUSTRALIA

Aboriginal Community Controlled Health Services (ACCHS)

In 2000–01, there were 107 Aboriginal Community Controlled Health Services across Australia governed by Aboriginal boards of directors elected by local Aboriginal communities. They comprise teams of Aboriginal health workers, nurses and sometimes GPs (180 FTEs in 2000–01), and allied health workers. Larger Aboriginal Community Controlled Health Services provide a range of clinical services and other health-related programs, and employ several doctors (generally from 3 to 8 or more FTEs) and a significant numbers of Aboriginal Health Workers (AHWs). In smaller Aboriginal Community Controlled Health Services, AHWs play a lead role and usually do not have access to on-site medical, dental or nursing care. In 2000–01, 43 per cent of all Aboriginal Community Controlled Health Services reported that specialists regularly consulted from their clinics and most services had preventive care and screening programs that formed the core of their activities (Hunter, Myers et al. 2004). Services receive multiple sources of funding in the form of direct funding or tied grants from the Commonwealth (Bartlett and Boffa 2005). Since the mid 1990s there has been considerable additional investment in Aboriginal health, including in Aboriginal Community Controlled Health Service.

Community health services (Victoria)

Victoria has a well established network of 100 community health services operating from over 300 sites providing services to local communities (Victorian Government 2009). Over 70 per cent are located in rural areas. They receive funding from a number of different government agencies and departments and fall into two organisational categories: independent, usually community governed centres (39), with the remaining 51 being mainly units or divisions of larger health services or hospitals.

A third (mainly metropolitan centres) have GPs operating from the same site, with some large centres employing up to 10 FTE GPs on a fee for service or salaried basis and there are a variety of working arrangements. These include income sharing agreements and co-location of private practices (Primary Health Branch 2007).

They provide a broad range of services aimed at improving and maintaining health, managing demand on acute services, particularly through prevention, respond to community needs, and strengthening communities. Common services include health promotion, counselling and support services, nursing, dental assistance and medical services and allied health services. Many CHCs have entered into management or co-location arrangements with other services, including more specialist community-based health services as well as welfare and support, legal and employment services (Burgell Consulting Pty Ltd, O'Leary & Associates et al. 2002). New governance and accountability arrangements were introduced in 2009 (the Health Services Legislation Amendment Act 2008) as the existing legislative framework was no longer considered to be appropriate for the current and future scope and role of community health centres, given their wider engagement across the range of human services (Victorian Department of Health 2009).

CANADA

Community health centres

Community health centres have been a significant part of the primary health care sector since the 1970s and were established as a key recommendation of a federal government taskforce established in 1971 to address problems in way existing health services were provided (Shah and Moloughney 2001). Community health centres generally serve local geographic communities of between 25,000 (rural) to 120,000 (urban) people (Canadian Alliance of Community Health Centre Associations 2004) or particular priority groups, for instance disadvantaged/vulnerable groups (the poor, remote, Indigenous). In some, but not all provinces, they have been established in areas of GP shortages (Albrecht 1998).

Until recently, Quebec has had the most coordinated and comprehensive approach, with 146 centres (known as CLSCs) covering the population and incorporating social services. More recently, the sector has undergone radical change with mergers, a loss of autonomy and government requirements that they provide a core range of services. While previously they were semi autonomous organisations and governed by community boards, the changes have bought them under a single governance model as part of hospitals and long term care.

Most community health centres consist of multidisciplinary teams of nurses, allied health care professionals, health workers and some employ GPs. Clinical services include primary medical care by GPs and nurses, dentistry, social work, mental health and other services, complemented by a range of preventive and health promotion services including 'well baby checks, social supports, advocacy, food and safety (Albrecht 1998).

There are two main models: non-government not for profit agencies governed by elected community boards of directors or centres which are part of a broader public health region network, overseen by an advisory committee. The type and degree of integration of community health centres with the rest of the health care system varies considerably. Partly this depends on the model type and also location. Community owned community health centres are generally least formally integrated, and while community health centres that are part of a regional structure are theoretically more formally integrated, there is considerable variation in the extent to which this includes integrated information and communication (ITC) systems, or mechanisms for integrated planning, service development or continuity of care.

Community health centres are funded under a variety of mechanisms including capitation or global budgets and most staff employed on a salaried or sessional basis. Most funding comes from the provincial government through the regional health authorities, and over time has been increasingly linked to the achievement of outcomes and evidence-based decision making. Government support has varied over time and by province, with consequent differences in their number, spread, funding and the extent to which they are an integral or more peripheral feature of recent primary health care reforms.

Family Health Teams

Family Health Teams in Ontario are capitation funded practices which bring together GPs, nurse practitioners and other nurses as the core team, and often other health care professionals including pharmacists, dieticians and mental health workers. Practices are required to be in existing GP networks (known as Family Health Networks) as a prerequisite for applying to become a Family Health Team. Additional money is provided by the government for lead GPs

and to support the employment of allied health professionals. This latter funding enhancement is one of the factors that distinguish Family Health Teams from earlier models which had a largely unfunded aim to encourage more interdisciplinary collaboration.

Family Health Teams are expected to provide extended hours of practice, link with community organisations and have an emphasis on chronic disease management and preventive care (Ontario Ministry of Health and Long Term Care 2009) and this focus will be supported by incentives. Family Health Teams have expanded rapidly, with 150 teams being approved, covering approximately 2.5 million registered patients across 112 communities. While most Family Health Teams are GP led, some are community-led and others are based on a mixed governance model. There are different models for collaborative care and inter-professional teamwork, but in most cases other professionals are integrated into the practices through use of a common health record In response to the need to assist practices with change management and team development, Quality Management Collaboratives have been funded to support implementation. Their initial focus has been on team development, training, and community partner linkages. Recently a five-year national evaluation has been commissioned to track their development and impact.

EUROPE

England: Personal medical services

There are two main types: those contracted to provide basic primary care services and those contracted to provide a broader range of services, such as community nursing and services for a particular population group. Legislation also allowed non-medical providers to establish Personal Medical Service contracts, with a number being nurse-led, though these proved to be short lived (McDonald J, Cumming J et al. 2006). In addition to be the first major model that funded practices rather than individual GPs, Personal Medical Services also aimed to address recruitment problems by providing GPs with a salaried employment option and were successful in attracting GPs and nurses to work in previously underserved and underprivileged areas (McDonald, Harris et al. 2008). A variety of governance models developed, with some co-located and integrated, while others involved the health professionals 'working together' closely or loosely (Walsh, Andre et al. 2002).

Polyclinics

Polyclinics are intended to combine primary, community and specialist health care services into a single setting for most routine healthcare for populations of approximately 50,000. They are also intended to provide infrastructure (such as diagnostics and consulting rooms for outpatients) to enable a shift of services out of hospital settings (NHS London 2007) . The policy outlines three polyclinic models

- networked group of practices which share referral protocols and care pathways into secondary care and a wide range of community based enhanced services
- same site polyclinics which bring together practices under one roof to share access to an extended range of services
- a hospital polyclinic (NHS London 2007).

The networked model is described as virtual hub and spoke arrangements, with a central centre/polyclinic of allied health, administrative (including IT/IM), diagnostic and minor surgery services and support functions available to a virtual network of GP practices (Higson 2008).

Prior to the policy announcement, a number of primary health care centres were already meeting the definition. One such centre is Litherland Town Hall Health Centre which opened in 2005 and operates as the hub of locally based health and social care services, serving a population of approximately 185,000. It comprises a GP practice, dental practice, nurse-led walk in clinic, after hours service for primary medical care, nursing, dentistry and pharmacy, community nursing, CDM programs, diagnostics and some secondary care services and a dedicated space for community activities (Imison, Naylor et al. 2008). Another model, the Hove Polyclinic is described as a hospital polyclinic that opened in 1998. It is similar to an outpatient unit of a small hospital, but as noted, there are no GPs involved (Finch 2008). Hence it does not meet the policy intention of strengthening primary health care.

Finland: Municipal health centres

Municipal health centres provide a wide variety of curative, preventative and public health services. Services can also include inpatient care (in larger cities these can be classified more as GP-run hospitals), and also radiological and laboratory services, facilities for minor surgery and endoscopic examinations in addition to consulting rooms for physicians and nurses. They are staffed by a wide range of health professionals including GPs, dentists, differing nursing disciplines and a variety of allied health professionals. In 2007 legislation was introduced requiring health centres to service populations of 20,000, with a 4-year transition period. Currently only one in four have achieved this target (Vuorenkoski L, Mladovsky P et al. 2008).

Germany: Polyclinics

Polyclinic numbers have grown rapidly since 2004 and by March 2007 their number had risen to 733, although the number of GPs working in them is still a small proportion (i.e. less than 5 per cent). GPs can now be employed by the polyclinics, which is a significant change from self employment (Hesse 2005) and perhaps not surprisingly, they are opposed by many self employed physicians (Blum 2007). It appears that despite the policy intention, polyclinics are still dominated by specialists and the majority of employees are doctors (Imison, Naylor et al. 2008). Not a great deal is written about them in English, but the Polikum model in Berlin, one of the largest polyclinics has been described. There are a mix of physicians (N=50), medical specialists (N=36) and GPs (N= 19) serving 10,000 patients. The facility also includes a pharmacy and imaging services and there has been considerable investment in the development of ITM systems, as well as in team working and quality improvement (Imison, Naylor et al. 2008).

NEW ZEALAND

Community controlled primary health care centres

NGO primary health care services have developed in three waves since the late 1970s. Initially they were set up as union health centres, but in the 1990s they expanded to include a strong focus on Maori and Pacific Islander communities, and more recently they have extended this to newly arrived refugee groups. There are approximately 65 services, the majority of whom are concentrated in the north island, where there are higher numbers of Maori and Pacific Islanders. Community governance is through the involvement of clients and local community members (e.g. representing trade unions, Maori, community organisations, other primary health care providers) on management committees. The services range in size, primary health care services and multidisciplinary staffing mix, which includes GPs, nurse practitioners, community workers and midwives (Crampton, Dowell et al. 2000). In some rural areas with high Maori populations, they include the provision of acute and inpatient care (McDonald J, Cumming J et

al. 2006). Most staff are salaried, although some GPs may be self employed (Crampton, Davis et al. 2005b).

UNITED STATES OF AMERICA

Community health centres

Across the US, there are about 1,200 community health centres[12] employing over 100,000 people and operating from 7,000 sites located in high-need areas. They are funded by the federal government specifically to provide a broad range of primary, community and support services for low income and uninsured groups. They include centres which serve a variety of underserved populations and communities (predominantly African Americans and Hispanics), migrant health centres for migrant and seasonal agricultural workers, and indigenous (ie tribal) health centres, Some centres are also funded to provide primary care and substance abuse programs for people experiencing homelessness and primary care programs for public housing residents. There is an annual reporting system (UDS) used by all centres to report on utilization, patient demographics, insurance status, managed care, prenatal care and birth outcomes, diagnoses, and financing (National Association of Community Health Centers 2008; National Association of Community Health Centers 2009).

Kaiser Permanente: Primary healthcare teams

These multidisciplinary teams were created in three regions (Georgia, Hawaii and Northern California) in the late 1990s. Teams comprised doctors, nurse practitioners, physician assistants, registered nurses and other staff (including medical specialists and other allied health professionals), with approximately 5 FTEs serving an enroled population of 10,000. Mid level practitioners took on an enhanced role, with registered nurses taking responsibility for routine chronic disease management. Doctors moved from working alone to being part of a team and training was provided to assist team development. Team consultants worked with the clinic physician-in-charge and the clinic manager to prepare for transition into teams (Roblin, Vogt et al. 2003)

[12] Also known as Federally Qualified Health Centers. This is a generic term covering public and private non-profit health centre who qualify to receive funding from the federal government.

APPENDIX 2: METHODS

(a) SEARCH TERMS FOR ELECTRONIC DATABASES

MEDLINE	1. exp Primary Health Care 2. exp Ambulatory Care Facilities/ or Ambulatory Care/ 3. exp Community Health Services/ 4. exp Family Practice/ or family practice.mp. 5. exp Health Care Reform/ or health care reform.mp. 6. exp Primary Health Care/ or primary healthcare.mp. 7. exp "Delivery of Health Care"/ or healthcare.mp. 8. primary.mp. 9. primary care.mp. 10. primary medical care.mp. 11. general practice.mp. 12. family medicine.mp. 13. family practice.mp. 14. Ambulatory care facilities.mp. 15. Community healthcare.mp. 16. Community health care.mp. 17. primary care model.mp. 18. primary health care model.mp. 19. community oriented primary care.mp. 20. exp Community Networks/td, 21. exp Primary Health Care/ or exp Community Health Services/ or exp Community Health Centers/ or exp Family Practice/ 22. polyclinics.mp. 23. community health centres.mp. 24. Comprehensive primary health care centres.mp. 25. Medical care centres,.mp. 26. family medicine groups.mp. 27. group medical practices.mp. 28. Co-location.mp. 29. virtual team.mp. 30. Virtual integration.mp. 31. Hub and spoke.mp.

	32. family health teams.mp. 33. GP-led.mp. 34. nurse-led clinics.mp. 35. Primary care trusts.mp. 36. Integrated model.mp. 37. Community network.mp. 38. Clinical networks.mp. 39. Patient care team.mp. 40. Multidisciplinary care teams.mp. 41. Multi disciplinary.mp. 42. interdisciplinary.mp. 43. inter disciplinary.mp. 44. transdisciplinary.mp. 45. trans disciplinary.mp. 46. Interprofessional.mp. 47. interprofessional relations.mp. 48. collaboration.mp. 49. Team based care.mp. 50. skill mix.mp. 51. team care.mp. 52. allied health.mp. 53. exp Decision Making/ or exp Patient Care Planning/ 54. exp "Delivery of Health Care"/og, sd, td [Organization & Administration, Supply & Distribution, Trends] 55. exp Comprehensive Health Care/ or exp "Delivery of Health Care, Integrated"/ or exp "Delivery of Health Care"/ or exp Family Practice/ 56. Organisation and Administration.mp. 57. Models, Organizational/ 58. Referral and Consultation.mp. 59. 65. Care pathway.mp 60. Chains of care.mp. 61. Planned care.mp. 62. Managed care.mp. 63. (Integrated care or services).mp. 64. Integrative medicine.mp.

	65. (care or service integration).mp. 66. (Coordinated care or services).mp. 67. Care coordination.mp. 68. coordination of care.mp. 69. Care sharing.mp. 70. Shared services.mp. 71. Service planning.mp. 72. Service provision.mp. 73. collaborative practice.mp. 74. Collaborative links.mp. 75. integrative medicine.mp. 76. Clinical integration.mp. 77. Financial integration.mp. 78. funding models.mp. 79. reimbursement mechanisms.mp. 80. Continuity of care.mp. care continuity.mp. 81. Horizontal integration.mp. 82. (Single governance or management).mp. 83. Integrated service network.mp. 84. Service network.mp. 85. Evaluation Studies/ 86. exp Program Evaluation/mt, 87. (Benefits and costs).mp. 88. efficiency.mp.
EMBASE	1. exp Primary Health Care/ 2. exp Ambulatory Care/ 3. exp Community Care/ 4. exp General Practice/ 5. exp Health Care Policy/ 6. primary healthcare.mp. 7. healthcare.mp. 8. primary.mp. 9. primary care.mp. 10. primary medical care.mp. 11. general practice.mp.

	12. family medicine.mp. 13. family practice.mp. 14. ambulatory care facilities.mp. 15. community healthcare.mp. 16. community health care.mp. 17. primary care model.mp. 18. primary heal;th care model.mp. 19. community oriented primary care.mp. 20. community health networks.mp. 21. community health centres.mp. 22. polyclinics.mp. 23. community health centres.mp. 24. comprehensive primary health care centres.mp. 25. medical care centres.mp. 26. family medicine groups.mp. 27. group medical practices.mp. 28. co-location.mp. 29. virtual team.mp. 30. virtual integration.mp. 31. network.mp. 32. (hub and spoke).mp. 33. family health teams.mp. 34. GP-led.mp. 35. nurse-led clinics.mp. 36. NP-led clinics.mp. 37. primary care trusts.mp. 38. integrated model.mp. 39. community network.mp. 40. clinical networks.mp. 41. patient care team.mp. 42. multidisciplinary care teams.mp. 43. multi disciplinary.mp. 44. interdisciplinary.mp. 45. inter disciplinary.mp. 46. transdisciplinary.mp. 47. trans disciplinary.mp. 48. interprofessional.mp.

	49. interprofessional relations.mp. 50. collaboration.mp. 51. team based care.mp. 52. skill mix.mp. 53. team care.mp. 54. allied health.mp. 55. exp Patient Care/ 56. exp Primary Medical Care/ or exp Community Care/ 57. exp Community Care/ or exp Health Center/ or exp Primary Medical Care/ or exp Primary Health Care/ 58. exp Treatment Planning/ or exp Health Care Planning/ or exp Patient Care/ 59. exp Health Care Delivery/ 60. exp Health Care Delivery/ or exp Health Care/ or exp Health Care System/ or exp Health Care Organization/ or exp Integrated Health Care System/ 61. (organisation and administration).mp. 62. exp Health Care Organization/ 63. (referral and consultation).mp. 64. exp Evaluation/ 65. exp Health Care Quality/ 66. care pathway.mp. 67. chains of care.mp. 68. planned care.mp. 69. managed care.mp. 70. (integrated care or services).mp. 71. integrative medicine.mp. 72. (care or service integration).mp. 73. (coordinated coordinated care or services).mp. 74. care coordination.mp. 75. coordination of care.mp. 76. care sharing.mp. 77. shared services.mp. 78. service planning.mp. 79. service provision.mp. 80. collaborative practice.mp. 81. collaborative links.mp. 82. integrative medicine.mp. 83. clinical integration.mp.

	84. financial integration.mp. 85. funding models.mp. 86. reimbursement mechanisms.mp. 87. continuity of care.mp. 88. care continuity.mp. 89. horizontal integration.mp. 90. (single governance or management).mp. 91. integrated service network.mp. 92. service network.mp. 93. (benefits and costs).mp. 94. efficiency.mp.
CINAHL	S1. TI primary health care S2. TI primary health care and community health centers and primary care organizations S3. Primary health care or healthcare or primary or primary care or primary medical care or general practice or family medicine or family practice S4. Ambulatory care facilities or Community healthcare or Community health care, or primary care model or primary health care model, or community oriented primary care S5. Community health centres S6. Community health centres or Community health networks S7. Polyclinics S8. Polyclinics or community health centres or Comprehensive primary health care centres, or Medical care centres or family medicine groups or group medical practices S9. Co-location or virtual team or Virtual integration or Network or (Hub and spoke) or family health teams or GP-led or nurse-led clinics, or NP- led clinics or Primary care trusts or Integrated model S10. Community network or Clinical networks S11. Patient care team S12. Patient care team or Multidisciplinary care teams or Multi disciplinary or interdisciplinary or inter disciplinary or transdisciplinary or trans disciplinary S13. Team based care or skill mix or team care or allied health S14. Care planning or Delivery of Health Care or Integrated health care or Organisation and Administration or Organizational models or Referral and Consultation S15. Care pathway or Chains of care or Planned care or Managed care or Integrated care or services or Integrative medicine S16. Care pathway or Chains of care or Planned care or Managed care or Integrated care or services or Integrative medicine S17. Care or service integration or Coordinated care or services or Care coordination and

	coordination of care or Care sharing or Shared services S18. Care pathway or Chains of care or Planned care or Managed care or Integrated care or services or Integrative medicine or care or service integration or Coordinated care or services or Care coordination and coordination of care or Care sharing or Shared services S19. Service planning or Service provision or collaborative practice or Collaborative links or integrative medicine or Clinical integration S20. Integrative medicine or Clinical integration S21. Financial integration or funding models or reimbursement mechanisms or Continuity of care or care continuity or Horizontal integration or Single governance or management S22. Integrated service network or Service network S32. Evaluation studies or Program Evaluation S33. Benefits and costs or efficiency

B) WEBSITES SEARCHED

Country	Organisation	Web page address
CANADA	CT Lamont Centre	www.bruyere.org/bins/content_page.asp?cid=12-128&lang=1
	Ontario ministry of Health	www.health.gov.on.ca/transformation/fht/fht_mn.html
	British Columbia, Ministry of Health	www.gov.bc.ca/health/
	The Institut national de santé publique du Québec (INSPQ)	www.inspq.qc.ca/english/publications/default.asp?NumPublication=911
	Primary Health Transition Fund the College of Family Physicians of Canada	www.hc-sc.gc.ca/hcs-sss/pubs/prim/2007-initiatives/2007-initiatives-eng.php Actively Building Capacity in Primary Health Care Research www.cfpc.ca/local/files/Research/ABC/OVERALL%20ABC.pdf www.cfpc.ca/local/files/Research/ABC/ABC%_20Lexicon-Feb%_2020-06.pdf
	Health Integration Initiative	www.hc-sc.gc.ca/fniah-spnia/services/acces/pan-initiative-eng.php
	Canadian Collaborative Mental Health Initiative	www.ccmhi.ca/en/products/series_of_papers.html

Country	Organisation	Web page address
	Ontario Health Quality Council	www.ohqc.ca/en/yearlyreport.php
EUROPE	European Observatory	www.euro.who.int/observatory
	Health Policy Monitor	
FINLAND	Ministry of Social Affairs and Health	www.stm.fi/en/social_and_health_services/health_services/primary_healthcare
NEW ZEALAND	Ministry of Health New Zealand	www.moh.govt.nz/
	The Royal New Zealand College of General Practitioners	www.rnzcgp.org.nz/apollo-medical
UNITED KINGDOM	Kings Fund	www.kingsfund.org.uk/research/projects/assessing_the_evidence_on_polyclinics/
	Nuffield Trust	www.nuffieldtrust.org.uk/
	NHS web sites	www.london.nhs.uk
	University of Birmingham Health Services management Centre	www.hsmc.bham.ac.uk/publications/Current.shtml www.hsmc.bham.ac.uk/news/pdfs/Altogether_Now_Report.pdf
UNITED STATES OF AMERICA	The Commonwealth Fund	www.commonwealthfund.org/
	The Robert Wood Johnson Foundation	www.rwjf.org/
	Robert Graham Centre	www.graham-center.org/online/graham/home.html
	TransforMED	www.transformed.com/ndp.cfm
	Guided Care	www.guidedcare.org/
	Medical Home Summit	www.medicalhomesummitportal.com/browse_category.php?cid=13
	National Association of Community Health Centers	www.nachc.org/
	Health Resources and Services Administration	http://bphc.hrsa.gov/
	Integrated Primary care	www.IntegratedPrimaryCare.com

(C) KEY INFORMANTS

Country	Informant
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Canada	Dr Grant Russell, University of Ottawa
England	Professor Martin Roland, University of Cambridge Helen Parker, Health Services Management Centre, Birmingham Helen Dickinson, as above. Dr Candace Imison, Kings Fund
Finland	Gun Eklund, Director of Development, Samfundet Folkhälsan
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United States of America	Dr Julie Will, Centers for Disease Control

PENDIX 3: OUTCOME ARTICLES BY MODEL TYPE

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
l tin .	Australia	Interviews with CHC managers and senior management teams (n=30 CHCs). The Integration Index survey completed by the GP; field interviews with CHS GPs; other measures (follow-up telephone requests for data or data clarification; with CHSs, group discussions with GPs in specific CHSs, a small field trial with GPs in one CHS and supplementary visits to relevant sites or organisations); and literature review.	GP service delivery demonstrated a capacity to meet complex primary care needs of socially disadvantaged groups in conjunction with other CHS health professionals. GPs more likely to service greater numbers of non English speaking background clients and clients who are health card holders. GPs more likely to see complex mental health, drug and alcohol problems, female clients from socially disadvantaged backgrounds who present with sexual and reproductive health needs, more likely to refer their clients to allied health professionals, more likely to use client diagnostic and assessment approaches. Working in collaboration with CHS allied health professionals and other community services, GPs often respond to domestic violence, homelessness, the impact of unemployment, loss of income and other social problems experienced by presenting clients. Enhanced Primary Care MBS items are at a beginning stage of usage by CHS GPs.	Broader Primary Health Care Centres (BPHCC)	Victorian Generalist Community Health Services (CHSs)
et 09,	Canada (Ontario)	Cross-sectional survey with nested qualitative	Health promotion was significantly higher in CHCs (CHCs put more emphasis on health promotion than other models).	CHC – BPHCC FHN –	Community Health

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
ss)		case studies (Same study groups as Russell 2009) A 7-item questionnaire, evaluating health promotion aspects across four models.	Primary care delivery model did not independently predict health promotion activity. Factors positively associated with health promotion: the number of nurses in a practice (but NPs were not associated with better health promotion), longer booking intervals for regular visits, practices with larger proportions of female FPs, smaller FP panel sizes, practices with smaller caseload, and patients with their own provider, general check-up or patients with CDM. Interviews: providers perceiving health promotion being seen as an integral part of primary care while others saying the important role of relational continuity in effective health promotion.	Extended General Practice (EGP) HSO - EGP	Centre, Family Health Network, Health Service Organisation
ell et 09, ss)	Canada (Ontario)	Cross-sectional survey of 35 practices of each model (except for HSOs n=32), with a concurrent nested qualitative case study (2 practices per model, interviews). Instruments: A provider survey, Practice survey, Chart abstraction tool - CDM Score for each patient	No differences between models were detected for the clinical intermediate outcomes except for diastolic BP, which was significantly lower in HSO patients. The presence of a NP associated with a 10 per cent absolute increase in CDM scores across all and better performance across FFS, FHN & HSO (the presence of other clinical disciplines didn't have positive association with CDM). Compared to smaller practices, larger practices (> 4 FTE FP) had an 7 per cent lower CDM score, lower performance in all models (in particular FFS) except for CHCs, and lower levels of care in all (in particular in CHC) except for FHNs. Higher patient load per physician associated with lower CDM	CHC – BPHCC FHN – EGP HSO - EGP	Community Health Centre (CHC), Family Health Network (FHN), Health Service Organisation (HSO)

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		constituting the study primary and secondary outcome measures.	scores. No evidence that the use of EMR influencing CDM scores. Qualitative data: longer consultations translate into better care; CHC FPs and NPs feel less challenged by time constraints; participation in collaborative teams means more comprehensive care and accurate documenting.		
e et 02)	Canada (Quebec)	A postal survey of the Quebec Community Health Care Centres (CHCC) consisting of 4 main programmes: the Elderly Home Care Programme (n=117), the Youth and Family Care Programme (n=90), the Ambulatory Walk-in Clinic Programme (n=90), and the Specialised Adult Care Programme (n=46). The response rate was 62 per cent.	Modest results in achieving interdisciplinary collaboration. The main factors associated with interdisciplinary collaboration: work group internal dynamics (contextual factors have a far less important impact); the presence of conflicting stimuli seriously undermined the strength of the CHCC work group's shared beliefs and strongly limited interdisciplinary collaboration; and administrative formalisation initiatives to enhance collaboration among different professions. The intensity of interdisciplinary collaboration depended on the nature of the task defined in terms of the type of clientele (eg the Elderly Home Care Programme being a favourable working environment which furthers interdisciplinary collaboration while the Ambulatory Walk-in Clinic Programme naturally leading less interdisciplinary collaboration)	BPHCC	The Quebec CHCC collaborative model
pto .	New Zealand	Observational study using a representative	Compared with patients at for-profit practices, community-governed not-for-profit practices served a younger, a poorer	BPHCC	Primary care teams:

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		survey of visits to GPs using National Primary Medical Care Survey (NatMedCa) did 2001-02.	(nearly three-quarters of whom had a means-tested benefit card; the majority of whom lived in the 20 per cent of areas ranked as the most deprived), largely non-European population who present with somewhat different rates of various problems (higher rates of asthma, diabetes and skin infections, but lower rates of chest infections). The overall morbidity burden did not differ between the two types of practice. Referral rates were higher in for-profit practices. The duration of visits was also significantly longer. No differences were observed in the average number of laboratory tests ordered. The odds of specialist referral were higher in for-profit patients when confounding variables were controlled for.		Community -governed non-profit practices
pbe	UK	Controlled before/after quantitative observational study in a sample of 23 PMS and 23 GMS practices. Case studies in all PMS pilots (interviews with key stakeholders, document review, and analysis of site-specific data).	Small but steady improvements both in PMS and GMS practices. PMS contracts facilitated quality improvements in specific areas (angina and elderly care) over and above these broad improvements, but costed more. Key facilitating factors to success: effective leadership and management, team work and shared culture, clear objectives and flexible professional relationships within practices, context specific design.	Combination of EGP and BPHCC	PMS pilots compared with GMS practices
ton	NZ	Face-to-face interviews with managers and other key informants,	The term third sector being non-government and non-profit, and usually employ salaried GPs. Overall the populations served were young: only 4 per cent of patients were aged 65	BPHCC	The third sector primary

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		and downloading practice computer information systems Data were collected from 15 third sector primary care organisations that were members of the Health Care Aotearoa (HCA) network.	years or older, and the ethnicity profile was highly atypical, with 21.8 per cent European, 36 per cent Maori, 22.7 per cent Pacific Island, 12 per cent other, and 7.5 per cent not stated. Community services card holding rates were higher than recorded in other studies, and registered patients tended to live in highly deprived areas. HCA organisations had high patient to doctor ratios, in general over 2000:1, and there were significant differences in management structures between HCA practices and more traditional general practice.		care organisations
bto . p)	NZ	National Primary Medical Care Survey (NatMedCa) done 2001-02 of nationally representative, multistage, probability sample of GPs and patient visits. 26 community-governed non-profit and 166 for-profit practices included.	Compared with for-profits, community-governed nonprofits: charged lower patient fees per visit; employed more Maori and Pacific Island staff, thus reducing financial and cultural barriers to access compared with for-profits; were less likely to have specific items of equipment; were more likely to have written policies on quality management, complaints, and critical events, and to carry out locality service planning and community needs assessments; and were more likely to have a separate board of governance, and the majority of these had patient representation on the board.	BPHCC	Primary care teams: Community -governed non-profit practices
r et 02)	UK	Telephone interviews with the 'lead professionals' at the 41	Under these selected PMS sites there has been improved access and enhanced availability of services for vulnerable client groups, for example:	BPHCC	PMS pilots targeting to improve access to

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		PMS sites. A maximum variety sample of 13 of the 41 sites selected for in depth studies (face to face interviews and collecting information on the quantity and costs of capital and recurrent resources used--the amount of resources given to the project, and apportioning this to key expenditure categories). Three local case studies.	Enhanced intra and inter-professional collaboration; Movement toward a dynamic social/public health model of health care, transforming primary care to primary healthcare; Partnership across health and social care sectors; Better access for the deprived to primary care; A growth and consolidation of the primary care team; and Prescribing has been clinically and cost effective. Recruitment of salaried GPs in deprived areas has remained a problem.		health care for vulnerable patient groups and reduce health inequalities
an ed)	UK	Qualitative study using interviews with primary care professionals (practice nurse, manager and GP) in the 33 practices (n=81).	PMS positively perceived as a quality orientated, locally sensitive contract. Three critical success factors: additional clinical staff, preferably GPs to free up time; professional leadership; a cohesive primary care team.	EGP	Second wave of PMS pilots

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
n et 08)	UK	Literature review on polyclinics. Examination of 12 NHS LIFT schemes which matched the polyclinic model most closely: structured interviews with 28 key stakeholders as well as representatives from acute trusts linked to the selected sites; site visits to 3 of the 12 schemes (informal dialogues with a broader range of staff regarding how the facilities were being used in practice and. feedback on patients' views).	For some health communities polyclinic-type facilities could offer real opportunities to establish more integrated, patient-focused care, but only if considerable investment of time, effort and resources is put into their planning and development. A major centralisation of primary care is unlikely to be beneficial for patients, particularly in rural areas. To maximise accessibility, choice of location is critical – polyclinics should ideally be developed in natural transport hubs. Substantial cost savings are unlikely to be made.	EGP	Polyclinics - The NHS LIFT (Local Improvement Finance Trust) scheme
& ey	UK	Postal Survey Of 53, 46 health authorities deemed eligible, 36 returned completed	Health authority (HA) perspectives of the achievements of PMS pilots: a reasonable level of success; good working relationships with PMS; modest benefits to recruitment and retention and working conditions, and reduced administration; and contribution to the local health economy (skill mix, service integration, flexibility, new services, new staff roles, better	Combination of EGP and BPHCC	PMS pilots

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		questionnaires (78 per cent response rate).	access). Facilitators: support, commitment and enthusiasm from within and outside the pilots, and the ability to be flexible Barriers: financial difficulties and a lack of understanding of PMS.		
	UK	Qualitative study – focus groups (n=9 nurse leaders of 9 PMS pilots), and a questionnaire (n=9 PMS sites).	Proved popular with vulnerable populations, often poorly served by general practice—raising ethical concerns regarding potential development of a two-tier service–with the disadvantaged receiving their care from nurses and the mainstream population from doctors. Initial conflicts with doctors but, the pilots have managed to negotiate a new doctor–nurse relationship within primary care and with hospital colleagues. Obstacles: Current NHS and welfare regulation are not sufficiently sensitive to the new role of nurses and need review; lack of clarity over the competencies, training and quality assurance of nurse practitioner services; lack of support from nursing professional bodies.	Combination of Extended General Practice (EGP) BPHCC	Nurse-led personal medical service (PMS) pilots
t 03)	UK	Qualitative study using in-depth interviews (via telephone) with 13 key informants from 41 PMS sites targeting inequities in access to primary care for	PMS increased collaboration between GPs, nurses and practice staff, but not necessarily leading to equal partnerships within primary care teams. Evidence of new intra and inter-professional partnerships being forged, providing the basis for further improved inter-sectoral collaboration; moving towards a community oriented/public health model with emphasis on	BPHCC	PMS pilots targeting inequities in access to primary care for vulnerable

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		vulnerable populations.	health maintenance for the vulnerable.		populations
ld	UK	Postal questionnaire from all PMS sites before and after. Twelve pilots selected for in-depth study (semi-structured interviews with key stakeholders).	The impact of salaried GP contracts: successfully addressing lack of GPs in deprived areas; a better match between workers and their jobs; modest but positive effect on recruitment, retention, work effort, and quality of care. Due to problems with obtaining accurate budgetary information, impossible to draw conclusions about the value-for-money of salaried contracts within PMS pilots (as salaried GPs take little responsibility for practice administration, more non-GP management resources may be needed in salaried PMS practices than standard GMS practices).	Combination of EGP and BPHCC	PMS pilots
ner	UK	Quality of care evaluation. Controlled before/after quantitative observational study in a sample of 23 PMS and matching 23 GMS practices. Data collected at several time points using a series of surveys, interviews with stakeholders from	Both PMS pilots and conventional GMS practices have made quality improvements in the areas of basic provision, chronic disease management, mental health care and, to a lesser degree, the primary care of older people. Leadership and management are critical to success of the pilots and other factors include the resources, freedom, and special status associated with PMS, all of which allowed them to focus on quality. PMS improves quality of care to a certain extents, but there is no single 'PMS effect': PMS is not a unitary phenomenon but a broad collection of diverse approaches to the organisation and delivery of care.	Combination of EGP and BPHCC	PMS pilots compared with GMS practices

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		pilots and HAs, and focus groups with elderly patients.			
n	UK	A case study design with 14 PMS pilots (interviews with all stakeholders, a questionnaire to all GPs used in year 3 to assess the benefits and problems of PMS in comparison with GMS, and focus groups with clients, document reviews, and additional telephone interviews).	(PMS sites selected based on organisational form; location; population size; and whether the site had a focus on older people and/or people with mental health problems). Accountability: accountability between the commissioner and the provider organisation is at an early stage, but 'conversations' have begun. No evidence indicating greater accountability to service users or the local population. Integration: some changes between and within professional groups; but largely unsuccessful with developing closer relationships with Social Services; the degree of integration between 14 PMS sites and other organisations within and outside of the NHS has been limited. Responsiveness: improved responsiveness in different ways among different sites (e.g. better access; better primary-secondary care interface; introducing a new primary care emergency unit).	Combination of EGP and BPHCC	PMS pilots
et 04)	US	Population data source: 1995-6. National Health Interview Survey (NHIS), restricted to lower income adults	The effects of community-level variables on access to ambulatory care for low income adults in 54 urban areas. Low-income residents, regardless of insurance status, are more likely to have visited a physician if living in an area with a greater number of health centres per low-income resident.	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		aged between 19 and 64, in 54 urban areas.			
n et 01)	US	Data sources: two population-based surveys: the 1994 National Health Interview Survey (NHIS) and the 1995 Community Health Center (CHC) User Survey.	Compares uninsured CHC users with uninsured nationwide. Uninsured CHC users are more likely to have a usual source of care than other uninsured (98 per cent vs. 75 per cent) and significantly more likely to receive health promotion counselling on smoking, drugs, and STIs.	BPHCC	Community Health Centres
et 07)	US	A survey of medical directors of all federally qualified CHCs in the United States in 2004 (N=800 54 per cent response rate). Additional data on each CHCs from the 2004 Uniform Data System (UDS).	Relationship between insurance status of CHC patients and access to off-site specialty services. Uninsured and Medicaid patients referred to medical specialists & treatment facilities have the most difficulty finding a provider compared to those with Medicare/private insurance. Patients from CHCs who were affiliated with a medical school or hospital had less difficulty than those with no affiliations.	BPHCC	Community Health Centres
et 08)	US	Audits of 4,795 randomly selected records across 10 sites of a Denver CHC	Whether CHCs (an urban safety-net system) eliminate or improve racial and ethnic disparities. No significant difference between racial and ethnic groups for	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		network from July 1999 to December 2000.	cancer screening, blood pressure control, and diabetes management. The quality of care provided met or exceeded national benchmarks.		
n	US	Multiple linear regression. Sources of data: elderly and low-income discharges from 1995-97 Virginia hospital discharge data; the 1990 Census, the 1998 Area Resource File, the 1996 American Hospital Association Survey, the Virginia Department of Health, the Virginia Primary Care Association, and the Bureau of Primary Health Care.	The relationship between ambulatory clinic availability and preventable hospitalization (PH) rates, controlling for population and other provider characteristics in a cross-section of zip code clusters. Patients in underserved areas served by CHCs had significantly lower PH rates than did other underserved populations (5.8 fewer preventable hospitalizations per 1,000 people over three years than those in underserved areas not served by a health centre). The presence of a free clinic had a marginally significant association with lower PH rates. The availability of public ambulatory clinics is associated with better access to primary care among low-income and elderly populations.	BPHCC	Community Health Centres
t al.	US	Analysis of claims data from 1.6 million Medicaid beneficiaries in 4 states (Alabama, California, Georgia,	Comparative effectiveness of Health Centres as regular source of care. Medicaid beneficiaries using health centres had one third fewer ACS events compared to other providers (5.7 vs. 8.2 ACS	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		and Pennsylvania) by type of provider.	hospitalizations and 26.1 vs. 37.7 ACS emergency department visits, respectively, per 100 persons). Medicaid beneficiaries relying on health centres for usual care were 19 per cent less likely to use the ED for an ACS condition and 11 per cent less likely to be hospitalized for an ACS condition than Medicaid beneficiaries using other primary/community physicians for usual care, even after controlling for case mix and other factors. ACS admissions were more likely in the groups who had mixed use (25 per cent or more of their care at multiple provider types) or low use (0 to 1 primary care visits).		
t al.	US	A study of Medicaid beneficiaries in 5 states in 2001.	Medicaid beneficiaries who receive care at health centres were significantly less likely to be hospitalised or to visit hospital emergency rooms for ambulatory care sensitive conditions (ACSCs) than beneficiaries who receive care from other providers.	BPHCC	Community Health Centres
t & n	US	Comparative analyses of 3 national surveys of primary care visits in 1994: for data on physician's office visits, the National Ambulatory Medical Care Survey (NAMCS); the National Hospital Ambulatory Medical	Established CHC patients were twice as likely to present new problems as established patients of hospital outpatient departments, and were also significantly more likely to do so than established patients of physician offices – indicating their continuity of care is better. Visits to CHCs were more likely to be made by ethnic minorities, patients with Medicaid or no insurance, and rural dwellers than visits made to the other delivery sites. Visits at hospital outpatient departments were made by sicker	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		Care Survey (NHAMCS); and the Bureau of Primary Health Care's 1994 Survey of Visits to Community Health Centres. A time trend analysis also was conducted using the 1998 NAMCS and NHAMCS.	populations and were characterised by less continuity than the other delivery sites. Controlling for patient mix, visits made to hospital outpatient departments were more commonly associated with imaging studies, minor surgery, and specialty referrals than those made to physicians' offices.		
&	US	1,175 individuals ages 18 and older from a 1995 survey of community health centre users.	Minority/lower SES status users of CHCs were not less likely to receive secondary preventive screening services than other adults, and that these screenings were more likely to be conducted at a CHC. CHCs provide preventive services to vulnerable populations that would otherwise not have access to certain services.	BPHCC	Community Health Centres
y & ugh	US	The 1998–1999 Community Tracking Study household survey, administered primarily by telephone survey to households in 60 randomly selected communities, linked to data on	To determine whether proximity to a safety net provider affects access to care by uninsured individuals. Uninsured people living within close proximity to an FQHC are less likely to have an unmet medical need, less likely to have postponed or delayed seeking needed care, more likely to have had a general medical visit, significantly less likely to have had an ED visit, and less likely to have a hospital stay compared to other uninsured.	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		community health centres, other free clinics, and safety net hospitals.			
	US	Comparison of prenatal care by provider type in New Jersey. Data collected in 2005. Various national and state data sources.	Babies born under care of CHC providers had lower incidences of very low-low birth weight compared to other providers (1.3 per cent vs. 1.6 per cent, & 5 per cent vs. 7 per cent). CHC rate of low birth weight among births by FQHC provider was 5.06 per cent vs. 6 per cent, and 1.28 per cent vs. 1.0 per cent for very low birth weights.	BPHCC	Community Health Centres
et 06)	US	Using data from medical records of nationally representative sample of health centre patients as well as patient & health centre characteristics associated with health outcomes between 1999 and 2000. 48 CHCs as intervention sites and 22 CHCs that had not	Health centre quality of care was comparable to or better than care delivered elsewhere, as measured by reduced hospitalisations and ED visits, and higher screening vaccination rates. Racial & ethnic disparities in quality of care were eliminated after adjusting for insurance. Health centres with computerised decision support tended to provide better care than those without.	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		participated in collaborative as controlled sites.			
et 07)	US	A societal cost-effectiveness analysis, incorporating data from QI program evaluation into a Monte Carlo simulation model of diabetes. Data regarding the impact of the Diabetes Health Disparities Collaborative (HDC) program came from a serial cross-sectional follow-up study (1998, 2000,2002) of the program in 17 Midwestern HCs. Data inputs for the simulation model of diabetes came from the latest clinical trials and epidemiological studies.	Between 1998 and 2002, multiple process measures of care improved, including glycosylated haemoglobin testing (71 to 92 per cent), lipid testing (52 to 70 per cent), and ACE inhibitor prescribing (33 to 55 per cent). Mean cholesterol levels also improved, decreasing significantly (mean difference -13.5). The HDCs also reduced expected lifetime incidence of diabetes complications, reducing the lifetime incidence of blindness (17 to 15 per cent), end-stage renal disease (18 to 15 per cent), and coronary artery disease (28 to 24 per cent). Average annual program cost per patient also declined over four years. Overall, the authors found that the HDC is cost effective, while reiterating that the costs of the HDCs are still borne by health centres.	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
& fly	US	Evaluation of the cost effectiveness of FQHCs in Michigan based on 2003-2004 Medicaid FFS claims data.	FQHCs patients incur lower total pre-member per-month Medicaid costs than non-FQHC users, even controlling for age and disability status. The study found that health centres save the State of Michigan $44.87 per member per month in Medicaid spending – totalling $17.8 million for the study period.	BPHCC	Community Health Centres
r et 01)	US	Analysis of recent data: the Uniform Data System (UDS); the Centre for Disease Control and Prevention's National Health Interview Survey (NHIS); health centre medical records and other databases (such as the Health Care Financing Administration's State Medicaid Research Files)	When compared to uninsured patients who do not receive care at health centres, health centre uninsured patients are much less likely to delay seeking care because of costs, go without needed care, or fail to fill prescriptions. Disadvantaged women using CHCs are more likely to receive mammograms, clinical breast examinations, and pap smears than comparable women not using health centres. The safety net health centre network has reduced racial/ethnic, income, and insurance status disparities in access to primary care and important preventive screening procedures. In addition, the network has reduced low birth weight disparities for African American infants.	BPHCC	Community Health Centres
et 99)	US	A survey study on the utilisation of cancer-screening services, including pap smear testing,	A higher proportion of health centre Hispanic and African-American women as well as women below poverty level are up to date on cancer screening than comparable women not using health centres.	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		mammography, and clinical breast examination. Comparative data for cancer screening are derived from the data for the general population from the 1992 NHIS.			
et 03)	US	Case study. Description three models of Kaiser Permanente primary health care teams (HCTs) (Northern California, Hawaii and Georgia) providing PHC to the MCO registered population.	The multidisciplinary teams vary in size and mix including physicians, nurses, medical assistants, pharmacists; +/- specialists). Major characteristics of the new PHC teams included structural integration (i.e. roles) and functional integration (i.e. team development). Core features involve expanded roles of mid level practitioners, redistributed tasks and development of teamwork culture. Evaluation data, albeit limited, suggests where similar levels of structural and functional integration have been achieved, the models have sustained/improved patient satisfaction, quality of care and staff morale. Negotiation around changed roles, team development and training was considered very important. The need for clear and unambiguous governance structures and processes—both internal to the PHCTs and between them	EGP	Kaiser Permanente

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
			and the central administration—was also identified.		
et 03)	US	The "2001 Patient Experience Evaluation Report System" (PEERS) surveys of health center patients. The data was compared with 1993 survey data.	High quality care as measured by patient experiences with health care, a consistent rate of improvement in critical measures such as equity, appropriateness, effectiveness and timeliness, and the patient-centered nature of the care. Positive outcomes were also noted when measured against with comparable studies of patient experiences in other care settings.	BPHCC	Community Health Centres
t al.	US	Analysis of data from 100 per cent of ED visits occurring in 117 rural counties in Georgia from 2003 to 2005.	Counties with a CHC had 25 per cent fewer uninsured ED visits per 10,000 uninsured populations than those counties without a CHC. CHC counties also had fewer ED visits for ambulatory ACS visits. These findings remained statistically significant even after controlling for poverty, percentage of African American population, and number of hospitals. No significant differences for the insured population. Simple primary care provider to population ratios do not affect uninsured ED visit rates, suggesting that expanding access to care for the uninsured requires adequate capacity to serve them.	BPHCC	Community Health Centres
al.	US	Data from two sources: the 1994 CHC User Survey (User Survey, randomly selected, representative sample of 48 CHCs; 1,932	While there are significant racial and ethnic health disparities among general population after controlling for socio-demographic factors, these disparities do not exist among CHC users. Non-white Hispanic CHC users experience healthier life than both white and African American users and no significant differences were found between white and African-American users. Among non CHC users, whites experienced significantly	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		randomly selected CHC patients interviewed). The 1994 National Health Interview Survey (NHIS) data was used as a comparison (general population).	healthier life than both African American Americans and Hispanics.		
al.	US	Analysis of data from Uniform Data System that collects information about 700 Community Health Centres each year (1996-2001).	To examine whether community health centres (CHCs) reduce racial/ ethnic disparities in peri natal care and birth outcomes. Across all years, about 60 per cent of CHC mothers received first-trimester prenatal care and more than 70 per cent received postpartum and newborn care. The disparity in rates of low birth weight (LBW) babies for blacks and whites was smaller in CHCs (3.3 percentage points) when compared to national disparities for low-socioeconomic stares mothers (5.8 percentage points) and the total population (6.2 percentage points). Within CHCs, increasing first-trimester prenatal care use through perinatal care capacity was associated with a lower LBW rate for the disadvantaged.	BPHCC	Community Health Centres
ns	US	Cross-sectional analyses of the 2002 CHC User Survey with comparison data from the 1998 and 2002 National Health	Health centre uninsured patients reported better primary care experiences in terms of access, having a regular source of care, and comprehensiveness than the uninsured nationally, and health centre Medicaid patients reported better care than Medicaid patients nationally. Health centre Medicaid and uninsured patients were more	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		Interview surveys. To compare the primary care experience of CHC uninsured and Medicaid patients to similar patients nationally.	likely to receive preventive screening such as, pap test, breast examination, mammogram, and colonoscopy, than Medicaid and uninsured patients nationally. For example, health centre Medicaid women aged 40 years and older were significantly more likely to have had a mammogram in the past 2 years than Medicaid women nationally (82 per cent vs. 56 per cent). Furthermore, health centres were considerably higher than the Healthy People 2010 national goal for three of the four preventive screenings. Additionally, health centre uninsured patients were much more likely to have had 4 or more visits to a general physician than uninsured patients (58 per cent vs. 40 per cent).		
al.	US	Analysis of data from the 2002 CHC User Survey and the 2002 National Health Interview Survey Comparison of access to care for health centre uninsured and Medicaid patients vs. uninsured and Medicaid-enroled people nationally.	A positive association between seeking care in community health centres and self-reported access to care for both uninsured and Medicaid patients. Health centre patients tend to have poorer health than non-health centre patients, yet access to care for health centre uninsured and Medicaid-enroled patients is as good as or better compared to their national counterparts, regardless of race/ethnicity, education level, and income level. Health centre uninsured patients were15.8 times more likely and health centre Medicaid patients were 13.4 times more likely to have a regular source of care than their counterparts nationally. When looking specifically at health centre populations by race, education level, and income, care was found to be better for	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
			these groups at health centres.		
t al.	US	Compiling measures of health status available by state and race, as well as state and income level (restricted primarily to those data sources for which data already were compiled for all states and the District of Columbia). Telephone interviews conducted during the first half of 2003 with the staff of five health centres.	The relationship between health centre penetration into medically underserved communities and the reduction of state level health disparities. As proportion of a state's low income population served by health centres increases, significant and positive reductions in minority health disparities; the non-white/ white gap declined in total death rate and prenatal care; and Hispanic/white disparities decreased significantly in the case of the tuberculosis case rate and prenatal care. Health centre penetration had the least impact reducing health disparities linked to diabetes and cardiovascular death rates.	BPHCC	Community Health Centres
et 00)	US	Evaluated the results of medical records reviews assessing the quality of care at CHCs for acute otitis media, diabetes, asthma, and hypertension. 20 centres located in each of 10 states selected.	Of the 31 care elements CHCs meet or exceeded prevailing practices across other health care settings (though some variation existed among sites). But CHCs fell significantly below the literature norms in terms of: eye exams for diabetes by the primary care provider or by eye specialists, baseline electrocardiograms and urinalyses for hypertension diagnosis, and follow-up scheduling with asthma.	BPHCC	Community Health Centres

or/s)	Country	Study design / methods	Relevant findings/results	Forms of Integrated PHC Centres	Models of Integrated PHC
		(Approximately 900–1,000 records abstracted for each condition, with a target of 50 cases for each condition at each centre)			

vidual chapters of the “National evaluation of first wave NHS Personal Medical Services pilots” report (2002)

ved from the same study

ved from a larger study entitled COMP-PC (Comparison of Models of Primary Health Care in Ontario) designed to describe and compare the ocess of care within 4 PHC delivery models in Ontario.

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nformed opinion articles. Includes editorials and letters without original data. Often cite information from other published data. Includes nor ws without rigorous methodology. These articles contain the least valid evidence.

escriptive studies. These are original works but do not compare interventions. Includes surveys and case studies.

uasi-comparative studies. Original studies comparing outcomes of different interventions but without controlling for the interventions in the

omparative studies. The study controls the interventions as with a controlled trial. Includes cross-sectional, case-control, cohort, pre/post-t and systematic reviews.

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