Regional health workforce planning in north Queensland: starting with the end in mind

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Primary care related solutions

- P1) Using integrated diabetes care plans (on-line accessed by all service stakeholders) for PHC oriented diabetes care.
- P2) Lack of integrated child and youth health programs.
- P3) Recruit, train and support Aboriginal and Torres Strait Islander Health Workers through possible establishment of a centre of training excellence for Aboriginal health workers.
- P4) Joint transition plan with clear milestones for delivery of joint model of care, human resource support services and innovative shared IT system planning.

Reinforcing and expanding secondary care

- S1) Locating renal dialysis services in Yarrabah through the implementation of a mixed funding “Kimberley model”.
- S2) Increase access to pharmacy services and increase revenue through take-up of Medicare funded medication review plans.
- S3) Expand the respite, palliative care and additional community support services that can be provided from Edmonton hub as opposed to Cairns.

Reducing demand on tertiary services

- T1) With expanded skill-sets and remote support of the primary care team, a range of services currently requiring specialist outpatient review at Cairns (or Yarrabah outreach services) could be provided in the community, utilising telehealth consultations where required.
- T2) Increased utilisation of telehealth would also reduce present volume of transfers with specialist services providing support to appropriately trained locally based GPs and nurses.
- T3) Strengthened primary care services reducing acute admission requirements.

Appendix C – Literature review on rural and regional health workforce planning and participatory approaches to health workforce planning

Introduction.

Methodology of the review.

Models of health workforce planning

- Health Workforce Australia.
- Australian Medical Workforce Advisory Committee.

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About Health Workforce Australia

Health Workforce Australia (HWA) is an initiative of the Council of Australian Governments (COAG), and has been established to address the challenges of proving a skilled, flexible and innovative health workforce that meets the needs of the Australian community, now and into the future.

HWA was established following the development of a $1.6Bn National Partnership Agreement (NPA) on Hospital and Health Workforce Reform by the Commonwealth and State and Territory Governments in November 2008.

HWA reports to Health Ministers and will operate across health and education sectors to devise solutions that integrate workforce planning, policy and reform with the necessary and complementary reforms to education and training.

HWA’s functions include

- The provision of comprehensive, authoritative national workforce planning, policy and research advice to Ministers, Governments and key decision makers in the health and education sectors.
- Improving and expanding access to quality clinical education placements for health professionals in training across the public, private and non-government sectors. This will be achieved through programs that expand capacity, improve quality and other diversity in learning opportunities. This also includes a national network of simulated learning environments (SLE’s) to enhance the quality, safety and efficiency of clinical training.
- Developing and implementing a national program of health workforce innovation and reform. This will encourage the development of new models of healthcare delivery, facilitate inter-professional practice and equip health professionals for current and emerging demands on the healthcare sector.
- Facilitating a nationally consistent approach to international recruitment of health professionals to Australia.
Executive Summary

Background

There are issues in the sustainability of the Australian health workforce that demand an urgent response. These issues are particularly acute in regional, rural and remote areas. Solutions to these issues require creativity and whole-of-systems thinking, transcending disciplinary silos and restrictions imposed by different funding streams and governance models. This demonstration project in far north Queensland was developed as an exemplar of participatory regional health workforce planning, as a complement to reactive planning assuming continuation of current patterns of healthcare utilisation into the future. It involves loco-regional health services and workforce planning, with healthcare providers from two rural communities of Mareeba and Yarrabah and their referral region of Cairns. The focus of this project is on using strongly participatory methodologies to create a flexible and sustainable rural health workforce plan that responds to community needs and considers all levels of health services.

Methods

This process involved a novel participatory action research approach informed by World Health Organisation systems thinking framework and exemplars of best practice in health service planning. Close working relationships were essential at all stages of the project. Key stakeholders included Cairns and Hinterland Hospital and Health Services, Far North Queensland Medicare Local, and clinical reference groups of providers from public, private and community-controlled sectors, across medicine, nursing, allied health and management fields, supplemented with project team and local council representatives.

The four stages in our participatory process (all conducted with clinical reference groups) were as follows:

- **Stage 1**: Rapid needs assessment and development of an essential health services plan (basket-of services).
- **Stage 2**: Remodel and build appropriate health service models which deliver the agreed upon priority health services.
- **Stage 3**: Assessment of the skills-sets required and configure the desired workforce needed to appropriately deliver these health service models.
- **Stage 4**: Development of a workforce and training plan for an appropriate health workforce to serve rural and remote population needs.

Process and scalability implications

Bringing stakeholders together in a collaborative, needs-based process of health workforce planning was viewed as extremely successful by all participants, in terms of both processes and outcomes. The process was effective in two extremely different communities in far north Queensland; one discrete Aboriginal community and one rural agricultural town, and has resulted in the development of a clear plan and set of steps for replicating the process elsewhere. Regionalisation of healthcare funding and planning nationally through Local Health and Hospital Networks (LHHNs) and Medicare Locals (MLs) adds to the strong case for this sort of planning to occur community-by-community at regional level. Community profiles and health needs assessments conducted under contractual agreements by Medicare Local will facilitate this process in other areas. The next step is replication of this process in a different region, with a different LHHN and ML and communities with varying characteristics, followed by the development of a generalisable tool-kit for regional needs-based health workforce planning that could potentially be rolled out nationwide.
Local outcomes delivered

The development and strengthening of a “fit-for-purpose” health workforce requires attention to workforce configuration (using available workforce working to their upper scope of practice), service redesign, education and training, and succession planning strategies to ensure sustainability. This workforce planning process (building upon the CHHHS health service plan 2012-26), has resulted in a gap analysis of the current model of service and associated health workforce. It also predicted demand for health workforce (accounting for community profiles), and devised solutions to health service delivery issues in the communities. Underlying successful health provision in the communities is the desire by the local health providers to strengthen the primary healthcare sector and its integration with secondary and tertiary care. Key features of the favoured models for healthcare delivery in these areas include:

- The provision of a “healthcare home” for those who are currently unable to access primary healthcare services through a regular GP.
- Better coordinated and integrated care of patients with chronic disease.
- Integrated health records.
- Further development of the secondary and ambulatory care available including local pharmacy services in the communities.
- Using telehealth/technological innovations to the maximum to reduce unnecessary patient travel and demand on the tertiary hospital in Cairns.

Multiple funding sources with separate agendas and accountabilities (and accompanying diverse organisational cultures) can and have resulted in a disjointed approach to health service workforce planning as well as duplication of tasks. Dominant small business models in primary care, and state government funding tied to activity rather than outcomes, can incentivise less efficient healthcare provision and minimise creativity in service delivery. However, locally these issues can be overcome by strong governance and an integrated joint stakeholder approach to health service and workforce planning.

Specific local solutions that are currently progressing well include:

- Public-private partnership in the provision of home-style renal dialysis at Yarrabah and at correctional centre in Mareeba.
- Development of a bulk-billing, multidisciplinary teaching clinic focussing on chronic disease in Mareeba.
- Expanded local surgical roster (by rural generalists) in Mareeba with strengthening of the surgical nursing workforce.
- Establishment of a cancer care coordinator role on the Atherton Tablelands.
- Targeted skills audit and training support towards Australian Health Practitioner Regulation Agency accreditation for Aboriginal Health Workers in north Queensland.
Table 1 below summarises the identified gaps in service provision for Mareeba and Yarrabah, as well as the proposed interventions/solutions and the issues that were experienced during the project.

Table 1: Identified gaps, proposed interventions and issues experienced, Mareeba and Yarrabah

<table>
<thead>
<tr>
<th>Sites:</th>
<th>Situation pre-project:</th>
<th>Interventions proposed:</th>
<th>Barriers/Issues:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mareeba</td>
<td>Lack of access to bulk-billed GP services</td>
<td>Bulkbilled chronic multidisciplinary teaching clinic</td>
<td>Combined support needed from the community and all health providers including private GPs</td>
</tr>
<tr>
<td></td>
<td>Insufficient coordination of palliative and cancer care services</td>
<td>Cancer care coordinator for the Tablelands</td>
<td>Recruitment and retention of skilled nursing and allied health staff very difficult in rural areas</td>
</tr>
<tr>
<td></td>
<td>Non-integrated health information systems</td>
<td>Patient held records (PCEHR)</td>
<td>Private gastroenterology</td>
</tr>
<tr>
<td></td>
<td>Poor response to the increasing prevalence of chronic disease</td>
<td>Tablelands aged care hub</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of appropriately trained hospital nursing and allied health staff</td>
<td>Public-private dialysis service</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Strengthen generalist model, new roles such as nurse endoscopists</td>
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<tr>
<td></td>
<td></td>
<td>Combined support needed from the community and all health providers including private GPs</td>
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<td></td>
<td></td>
<td>Recruitment and retention of skilled nursing and allied health staff very difficult in rural areas</td>
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<tr>
<td></td>
<td></td>
<td>Private gastroenterology</td>
<td></td>
</tr>
<tr>
<td>Yarrabah</td>
<td>Recognised need to expand management of chronic disease</td>
<td>Integrated diabetes care plans (online and open access)</td>
<td>Securing stable funding for long-term positions</td>
</tr>
<tr>
<td></td>
<td>Lack of integrated child and youth health programs</td>
<td>Maximise revenue through health check Medicare billing potential</td>
<td>Recruitment shortages of nurse practitioners</td>
</tr>
<tr>
<td></td>
<td>Health worker shortages</td>
<td>Centre of training access for aboriginal health workers</td>
<td>Local Aboriginal and Torres Strait Islander Health Worker training provider in early stages of development</td>
</tr>
<tr>
<td></td>
<td>Limited integration between service providers</td>
<td>Joint transition plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-coordinated approach to visiting allied health services</td>
<td>Increase utilisation of telehealth to reduce unnecessary transfers</td>
<td>Transition hampered by local health service restructure</td>
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</table>
Conclusions and next steps

1. Needs-based loco-regional health workforce planning is possible and highly acceptable, through participatory processes with all stakeholders involving systems thinking and creativity unbound by current funding or governance streams or disciplinary silos.

2. Real health systems and workforce and training solutions can be delivered by facilitating linkages and processes involving healthcare providers from all disciplines and health sectors in a planning process based on needs of community members. These include public-private partnerships in service provision models, telehealth solutions, task substitution and redistribution and increased use of delegated practice models, all aimed at meeting community needs.

3. High level management and governance support for the process from LHHNs and ML executives and boards and key local service provider champions are important facilitators of the process.

4. Although most healthcare providers are supportive of this process, some challenges remain in engaging private providers of primary care services in general practice and allied health in these collaborative processes. Creative thinking is necessary to tailor locally acceptable solutions in a non-competitive fashion.

5. Increasing regionalisation and decentralisation of health funding, planning and accountability strengthens the case for this kind of a process, which complements the large-scale aggregate health workforce planning done by HWA.

6. Workforce planners, educators and training providers need to think more in terms of competencies and skills-sets required to meet population health needs rather than qualifications. Planning must address current workforce needs, but also training and support to ensure sustainability of the health workforce into the future. Partnerships with universities and other providers of tertiary training of the health workforce are an essential part of this process.

7. Next steps involve replication of this process in another LHHN/ML region and with different communities. Through applying the model with different communities in another region we will be able to produce a generalisable Toolkit for Participatory Regional Needs-Based Health Workforce Planning, including guidance and a set of tools for working with communities, managers and healthcare providers. This could be used for conducting needs based health assessments, considering gaps in current services, reconfiguring health services and implementing health workforce and training plans to deliver those changes.
Background

Background to project

The recent HWA workforce reports' highlight that there are issues in sustainability of the health workforce that must be addressed with a degree of urgency. These issues with sustainability are particularly acute in regional, rural and remote areas, and for the nursing workforce.

Health workforce planning is often done reactively, assuming continuation of current patterns of healthcare utilisation into the future and adjusting for demographic projections. Whilst adjusting for growth and ageing in the population, this model assumes that health service utilisation is an accurate marker of health service need, rather than acknowledging the effect of access issues on healthcare utilisation (particularly marked in rural and regional areas). In this way, inefficiencies in workforce configuration and service models are perpetuated and gaps in services are maintained. Population level supply and demand modelling is not without problems – whilst it is usually possible to work out predicted supply of healthcare workers, demand is much more difficult to model, and in practice often health service utilisation is used as a proxy marker, occasionally combined with markers of health need).

Alternatively, small local community needs assessments are used to drive reform, whilst omitting consideration of the broader factors driving health workforce supply, service models and training). This small project attempts to combine these approaches – starting with real health service needs of the community at local level, then considering the health services required, the skillsets to deliver those services, novel ways to configure the workforce, and the education and training implications.

In parallel with HWA’s aggregate workforce planning methods this demonstration project is using a small area approach with a geographically bounded area including a regional centre (Cairns) and two small rural communities in north Queensland (Mareeba and Yarrabah) to develop a demonstration model of health workforce planning. The focus is on creating a flexible and sustainable rural health workforce plan that responds to community needs. We are considering all health professions and the intersection between primary care services and secondary and tertiary referral services. In this review, we are aiming to build on successful existing models of care at local level, and lessons learnt from other regions, and incorporate ways in which technological innovations in health service delivery can be used in a rural and remote context. This work builds on the existing partnerships between Cairns and Hinterland Hospital and Health Service (CHHHS), James Cook University (JCU), Queensland Aboriginal and Islander Health Council (QAIHC), Medicare Locals, private healthcare providers and community organisations.
Context – why north Queensland and Cairns and Hinterland region

In rural, regional and remote Australia, health service and workforce innovation is often more advanced when compared with more urban areas, as workforce shortages necessitate flexibility and a productive approach. In north Queensland a combination of progressive health service management and workforce shortages have led to a number of factors that facilitate the conduct of such a project in the area. Through testing and refining a process of collaborative health workforce planning at loco-regional level, the team felt that this process could be strengthened and trialled in other regions, with potential for national roll-out as a complement to large scale, demand based, health workforce projections. Cairns and Hinterland Hospital and Health Service (CHHHS; previously Cairns and Hinterland Health Service District) has been engaged in processes of regional needs assessments and health service planning in strong partnership with local rural communities and healthcare providers for some years. Healthcare reform processes have been incorporated in a very tangible way into this plan, with strong recognition of the importance of Queensland Health services collaborating with both general practitioners (and other private providers) and the Aboriginal and Islander Community Controlled Health sector in planning and service delivery. This work and collaborative approach to service planning and delivery is reflected in the CHHHS Health Services Plan 2012-2026 and accompanying workforce and training plans.

Furthermore, at local level in each of the two participating rural communities, significant efforts had been made to improve integration between different service provider sectors. A summary of the region and the two key communities are provided here in Appendices A and B.

Cairns and Hinterland Hospital and Health Service

This district covers an area of 142,900 kilometres from Tully in the south, Cow Bay in the north and Croydon in the west. There are 18 Statistical Local Areas within the Health Service, grouped into five planning regions (with proportion of the overall Health Service population).

- Cairns North and Douglas (22.6 per cent).
- Cairns City (24.8 per cent).
- Cairns South (20.7 per cent).
- Innisfail (12.6 per cent).
- Tablelands (19.4 per cent).
The secondary catchment for which Cairns Base Hospital is the primary referral centre includes the Districts of Cape York and Torres Strait and Northern Peninsula Area. The whole region (Far North Queensland) covers 16 per cent of the total Queensland land mass and Cairns itself is 1700 kilometres north of Brisbane.

Overall the population served by CHHHS is characterised by a large proportion of Aboriginal people and Torres Strait Islanders. In 2009, 23,162 people who identified as Aboriginal and/or Torres Strait Islander resided in the District’s catchment area, representing 14 per cent of all of Queensland’s Aboriginal and Torres Strait Islander population. Nine per cent of the district’s population is estimated to be Aboriginal or Torres Strait Islander, compared to 3.5 per cent for Queensland as a whole. This is significant due to the excess burden of disease and need for health services (together with barriers to health service utilisation) of the Aboriginal and Torres Strait Islander population.

Population growth is expected in the district overall, increasing to a total population of 297,716 people by 2026. Other changes expected include an ageing of the population with an increase by 112 per cent of the District population aged 65 years or older to 57,970 by 2026. This will be particularly evident in the Atherton Tablelands planning region (within which Mareeba is a major centre). This will lead to an increase in health service requirements for chronic disease and complex co-morbid disease services. Other challenges include the large proportion of the total resident population of the district living with the highest level of disadvantage, again most pronounced in the Tablelands region. In 2006, the highest level of disadvantage at a small local level were found in Yarrabah (100 per cent), Herberton on the Tablelands (79 per cent) and Central suburbs in Cairns City (75 per cent). High levels of social disadvantage and remoteness area are associated with lower health literacy and service accessibility and later presentations, resulting in higher rates of acute care admissions when compared to more advantaged city residents. Another planning challenge is the large transient population in the area, largely tourists.
Cairns Base Hospital provides community and specialist hospital services for Cairns and its immediate surroundings and is the major referral centre for tropical north Queensland. Services include all major health specialties (medicine, surgery, women’s health, paediatrics and mental health) and more than 30 sub-specialties. The hospital is also a major provider of outreach specialist services to remote and rural areas, including obstetrics and gynaecology, anaesthesiology, orthopaedics, general medicine, renal medicine, diabetes and thoracic medicine. The hospital has approximately 330 overnight beds (approximately 450 when bed alternatives are included). A major capital development is underway, to be completed by late 2014 and this will deliver another 168 beds. Some subspecialty and advanced care is not available at Cairns Base Hospital and the Townsville Hospital or major Brisbane hospitals are subsequent referral centres.

In 2010, the CBH provided 47,188 patient admissions, and 47,102 emergency presentations. The two communities partnering in this project are both within approximately one hour’s drive of Cairns.

Figure 2: Map of study areas
Mareeba

This is a rural community on the Atherton tablelands – the catchment area is around 22,000 people (7,000 in the town itself) and approximately 15 per cent of the population identifies as Aboriginal or Torres Strait Islander. It is largely a farming and mining community, with older population demographics (and aging), some socioeconomic disadvantage, and also the site of a large correctional facility.

The main service providers are QH (through a 45 bed hospital), 2 private general practices and a large Aboriginal and Islander Community Controlled Health Service (Mulungu Aboriginal Corporation). There is an existing agreement between QH, private GPs and the Chamber of Commerce for private GPs to provide services at QH facilities (including sharing after hour services) under a COAG Section 19.2 exemption around improving access to PHC in rural areas. The public hospital provides Accident and Emergency, Medical, Surgical, Theatre, and Maternity services (with an innovative midwife-led model). Specialist services provided through a variety of means include: Obstetrics and Gynaecology, Pharmacy, Radiology, Pathology, Mental Health, Oral Health, Palliative Care, ECG/CTG, Indigenous Health, cancer services (including some palliative care) and ATODS (Alcohol Tobacco and Other Drugs Service). Mareeba and Atherton Hospitals are the two major hubs for QH service provision on the Atherton Tablelands, and planning needs to consider how services can be shared between them, rather than duplicated. More detail will be provided in the Mareeba summary (Appendix A).

Yarrabah

Yarrabah is a discrete Aboriginal community, with a difficult history as an ex-mission community. The area has a population of approximately 2,500 people as at 2008. The Australian Bureau of Statistics note that official estimates of population may be undercounts due to both language barriers and the transient nature of residence of the outstations. This would be consistent with findings from other Indigenous communities. The median age of Yarrabah residents was 21, compared with 34 for the Cairns statistical district. There are high levels of unemployment and, using Census data, 100 per cent of residents are classed as having the highest level of socioeconomic disadvantage. Historically, there have been two main providers of health services in Yarrabah – Gurriny Yealamucka, an Aboriginal Community Controlled Health Services, and a Queensland Health PHC centre, with no inpatient care. Currently a planned staged transition of health services from QH to Community control is well underway. This will be further described in the Yarrabah summary (Appendix B).
Methodology and Process

This project uses an action research methodology, involving key stakeholders in four cyclical stages of health workforce planning, with continuous process evaluation. It draws significantly on the “Ten Steps to Systems Thinking” approach promoted by the World Health Organisation. They propose four steps in intervention design for health system strengthening: convene stakeholders; collectively brainstorm effects of interventions; conceptualise effects; adapt and redesign, and also six steps in evaluation design to follow on from this. This project also draws on exemplars of best practice in health workforce and service planning from abroad, for example the Canterbury Initiative from New Zealand, which is a clinician led model for reforming various sectors of the health system, and the Scottish Remote Service Futures project which involves community members and service providers explicitly in participatory health service planning, and includes progressive thinking around models of service delivery and configuration of health workforce roles. We have drawn on elements of each of these in developing our own participatory methodology that has potential to be replicated in a wide variety of different settings and environments.

The four stages in our process (all done in collaboration with local clinical reference groups) are as follows:

• Stage 1: Conduct a rapid needs assessment and develop and propose an essential health services plan (basket-of services) for each of the planning areas based on a health needs assessment process.
• Stage 2: Remodel and build appropriate health service models which deliver the agreed priority health services.
• Stage 3: Assess the skill-sets required and configure the desired workforce needed to appropriately deliver these health service models.
• Stage 4: Develop a workforce and training plan which details and costs the training of an appropriate health workforce to serve rural and remote population needs.

Each of these will be discussed in more detail below.

Choice of action research methodology

Action research is a useful methodology when the intent is to generate transformative change through the process of the research itself, by means of iterative stages of studying a problem or issue, using collaborative processes to generate a range of possible solutions to the problem, choosing and implementing one solution, and evaluating the outcomes. This is then followed by further cycles of research. It is very often combined with techniques for optimising participation of a range of stakeholders in the conduct of the research, and in this case is known as Participatory Action Research (PAR). PAR has been increasingly used in health systems research in recent years. In particular, processes involving the participation of key health service personnel (healthcare professionals, managers and funder) and other representatives from communities have been used in variety of ways in Scotland, New Zealand and Australia to contribute to the strengthening and redesign of health and other services. The intent is often to overcome the barriers to change that often arise in health service reform that is vertically imposed with minimal grass-roots input and participation.

Choice of regional groupings of communities and local referral services

Regionalisation of health funding and planning functions, through the Local Health and Hospital Networks (LHHNs; in Queensland referred to as Hospital and Health Services) and Medicare Locals (MLs) together with a consumer-focus based on healthcare homes and patient journeys, suggests that working at local community level in partnership with regional referral and support networks is likely to have the greatest effectiveness. The James Cook University project team have strong ongoing relationships with the Cairns and Hinterland Hospital and Health Service, a region that has been proactive and creative in its forward health planning. We purposefully chose two communities within this region with very different community characteristics and health service profiles, to assess the flexibility of our proposed process in responding to community needs. We consciously decided to build
on existing work in needs assessments, health service and workforce planning rather than duplicate efforts. Details about the communities and their existing health services are found in the community profiles included as Appendix H. Both of these communities were located just over one hour’s drive from Cairns. The Far North Queensland Medicare Local was established in the third and final tranche of Medicare Locals in July 2012, and thus was at a relatively early stage of development during this project.

Outline of phased approach

Ethics approval and site-specific approval for this project was gained from the Cairns and Hinterland Hospital and Health Service District Human Research Ethics Committee, and from James Cook University Human Research Ethics Committee (Appendix 1). The initial core project team included academics with medical, nursing population health/program management team and CHHS managers from allied health, nursing, medicine and Indigenous Health. Locally, resident project officers were appointed part-time in both of the participating communities.

Figure 3 outlines the approach schematically and each of these will be followed by a description.

Figure 3: Diagram of approach. Note: clinical reference group meetings inform each stage.
Stage 1: Clinical reference groups and needs assessment

Figure 4: Steps in stage 1 – Needs assessment

- Identify stakeholders at local/regional level and convene regional clinical reference groups
- Rapid appraisal needs assessment
- Determine essential "basket-of-services"
- Gap analysis

Establishment of local clinical reference groups

A first important step was to talk to key service providers at each site to gain agreement to participate in a process of joint health service planning. Clinical reference group members were selected with a view to maximising participation from healthcare providers in each of the two project sites, supplemented by healthcare professionals from Cairns with responsibility for service provision in those sites. Although participants were invited onto the clinical reference groups as individuals, we were careful to ensure that healthcare providers and managers from private providers, the community-controlled health sector and from all parts of Queensland Health were included. We also took care to ensure that representation included medical, nursing and allied health input across these service providers (Box 1).

Box 1: Key stakeholders for clinical reference groups

- Healthcare providers
  - medical, nursing, allied health, Aboriginal and Torres Strait Islander health worker
  - public, private, ACCHS
  - local, regional
- Health service managers (incl. ACCHS peak bodies)
- Local council
- Non-government organisations
- HHS and ML
- Consumers
Initial contact was made by telephone and email, and then initial face to face meetings with the core project team occurred in Mareeba on the 30th August (visits to Mulungu Aboriginal Corporation, two private general practices and Mareeba Hospital) and Cairns (with key Yarrabah stakeholders) on 31st August. There was a subsequent meeting at Yarrabah on 17th September (again with representatives from both Gurriny Yealamucka and QH). The process is summarised in the Project Timeline in the Appendices, as is a list of the members of the Clinical Reference Groups at each site (Appendix yy). The purpose of these initial meetings was to:

- Provide further background to the project and its purpose.
- Gain suggestions for membership of the local Clinical Reference Group (and a local Project Officer).
- Gain agreement about access to local service utilisation and workforce data.
- Initial discussion about local service provision and needs and gaps in health services and workforce.

In parallel with this process, a comprehensive literature review around regional health workforce planning was conducted and ethical approval processes were finalised.

**Rapid appraisal needs assessment**

The next phase of the process was to gather as much background information as possible on the two partner communities in terms of the population, health needs, current health service provision and utilisation, and local workforce and planning.

This involves triangulating data from a number of sources.

- Reference group meetings and individual meetings/interviews with health service providers and other stakeholders.
- Existing demographic data.
- Mapping of existing health services.
- Mapping of existing health workforce (and existing workforce plans).
- Service utilisation data – local primary care (population profile of patients, number of services provided, per cent bulkbilled), local hospital (OP and IP), referral hospital for local people.
- Health status indicators for communities – eg. Self-reported prevalence of diabetes and other chronic conditions. From National Health Survey at closest level possible.
- Demographic projections of population and age and from these projections of changes in chronic disease rates – eg. DM, Chronic renal failure/dialysis needs
- Existing community consultation reports.
Specific data collected and reviewed for both Mareeba and Yarrabah (in addition to reference group minutes and individual meetings and interviews) included:

- Demographic profiles from 2011 census – population profiles, socioeconomic data and population projections.
- Population Health Atlases prepared for both participating Community Controlled Health Services by Queensland Aboriginal and Islander Health Council (QAIHC).
- Audits of existing workforce (across all providers) and existing Queensland Health workforce plans.
- Health service utilisation data—admissions/hospital separations, ambulatory care sensitive admissions (QH systems); services provided and patient demographics for private providers; services provided and demographics for ACCHS sector.
- We offered to finance the production of Practice Health Atlases for the two private general practices in Mareeba, however this was not accepted by Practice Principals.
- Information from National Health survey on prevalence of long term health conditions.
- Geographically adjusted population health need (based on population health indicators).
- In addition, extensive community consultation around health services was conducted by Tablelands Regional Council in Mareeba (with input from QH) in late 2011/2012 and in Yarrabah by QH. This information about perceived community needs was used rather than repeating the process.

All available information for each community was compiled into a community background report, and used to inform a preliminary gap analysis. These background reports have been included in the next sections, and were provided to clinical reference group members to inform their discussions.

**Agreement on essential “basket of services”**

Based on initial discussions with all stakeholders, we developed a list of essential services (and some principles for service delivery) for meeting the needs of each community. A draft form of this was presented at the first Clinical Reference Group meeting at each site, and then refined with input from members. Although the relative weightings of these differed between sites, these key elements were all present in the services required by both communities. They are presented here in terms of the essential services required by each community, and a set of delivery requirements and principles within with the basket of services should sit.

Vital elements of the “basket of services” include:

- Provision of whole person, continuing, comprehensive primary healthcare (i.e. Including access to prevention and health promotion services, chronic disease management and acute care services). Most participants felt that encouraging the concept of a “medical home” or “healthcare home” for residents was important for managing and coordinating healthcare needs and access. Most felt that private General Practice and the AICCHS sector were the most important places for this to occur, although currently, for many patients, QH was the main provider of PHC services.
- Access to particular services: acute inpatient, maternity, surgical, medical, paediatrics, mental health, cancer/palliative care; community and allied health services.
- Access to After Hours emergency care (including emergency transfers when required, and appropriate pathology, radiology and pharmacy services).
- Access to specialist advice and services in a timely fashion when needed (including hospital admission and procedures as necessary). This could be provided directly, or through telemedicine support, or additionally from trained-up generalists with specialist skills in particular areas.
Service delivery requirements and principles to support the essential services include the following:

- Services should be accessible, culturally appropriate, high quality and affordable.
- Services need to be responsive to changing community needs. For example, developing programs in particular areas, responding to high rates of morbidity e.g. renal/dialysis programs, maternity services, oncology programs etc.
- Cradle to grave service provision, as close to home as possible.
- Focus on generalism and workforce flexibility to optimise use of available workforce.
- Multidisciplinary teams involved in service provision, with flexible allocation of roles.
- Integration of services to streamline the patient journey and optimise safety. Breaking down barriers between the provision of community and hospital services and communication between them, including the way the workforce is shared between them.
- Teaching and learning health systems. Linked up clinical supervision (undergraduate and postgraduate) and management, clinical leadership, good education, learning environment, good training programs will all assist with the quality of service provision and the sustainability of the health workforce.

**Gap analysis**

Through comparing existing health status and health services with the agreed “basket of services” and related principles a gap analysis process occurred. This was considered in terms of the current population but also in terms of projected population and health service demand. Priority gaps in service provision and areas of unmet need were identified in consultation with service providers through a process of providing information on current status and services and then brainstorming priorities. Gaps identified at each site have been described in the results section.
Stage 2. Remodel and design appropriate health service model to deliver priority health services

Figure 5: Steps in stage 2 – Remodel and design appropriate health service model to deliver priority health services

- Draw overall health service model (current and ideal/proposed to meet need)
- Discuss with clinical reference group
- Brainstorm effect of change in these directions and what it would take
- Prioritise elements for action (priority and achievability)

Modelling current and proposed health service

The next meetings with site-specific reference groups involved looking at remodelled integrated health service models which deliver the agreed upon priority health services. These considered both strengthening existing local and outreach models of service provision and balancing this with appropriate regional location of services. Possible innovations in rural health service delivery included consideration of a telehealth-supported healthcare future and innovations in the public-private interface in service delivery.

Findings from Stage 1 were used to produce visually appealing models of the current health service model in each community. Various iterations of these were made. Initially we attempted to draw patient centred models with concentric circles representing (in turn) primary, secondary and tertiary healthcare delivery systems, with changing diameters representing alterations in the focus of local healthcare services. The complexities of representing patient journeys between these three parts of the health system resulted in a reversion to a more linear representation to use as the basis for discussion and creative thinking with the clinical reference groups at each site.

One model was drawn of the existing state of health services, with another for the ideal proposed health service if it was to respond to current and project health needs. Examples of these for each site are presented in the results section.
Discuss with clinical reference groups – brainstorming effects of change and prioritise elements for action

The next round of clinical reference group meetings at each site had a suite of purposes:

- To present and discuss overall the health service models (current and proposed).
- Drawing strongly on WHO systems thinking approaches8 to brainstorm the effect of changes in the direction proposed (both intended and unintended) and what would be involved to implement/redesign system to facilitate these changes.
- To revise and improve the models based on stakeholder views.
- To prioritise a number of solutions proposed to meet needs gap that will help move the system towards the revised proposed/ideal model. The process of prioritisation of solutions involved putting them all on the wall of sheets of butcher’s paper and allowing clinical reference group members to allocate three votes (sticky paper) for priority/urgency of solution and three votes for achievability/feasibility of the solution.

This set of processes left us with a defined set of priority areas to focus on in terms of working up detailed solutions for identified gaps in health services.

Stage 3: Assess skills set required and configure desired workforce to meet need

Stage 3 of the project considered assessment of the skills-sets required to meet the needs of the population of the study sites and from there configuring the desired workforce needed to best deliver these health service models with an emphasis on future projections. The essential questions at this stage included: what workforce do we have?, where are the gaps?, Who could be used better?, and How can we pay for it? This stage of the project involved mapping the existing workforce (considered in terms of skills-sets provided rather than necessarily particular professions) against what is required under the revised model. The focus for this workforce planning is on doctors, nurses, midwives, allied health personnel and Aboriginal and Torres Strait Islander Health Workers and on training these rural health workers to have a wide range of general skills. Evidence shows that health professionals with more “generalist” skills provide better health outcomes at a lower cost in rural areas15.
Detailed design of workforce solutions in prioritised areas

Each of the solutions that had been prioritised in Stage 2 was then worked up, using local knowledge and ideas sourced from the clinical reference groups, supplemented by information from best-practice exemplars in other regions. Partnership with a university and health services researchers facilitates knowledge of, and access to, information about these exemplars. The solutions are numbered and categorised as primary, secondary or tertiary care solutions, and presented in terms of the issue, the proposed solution, the workforce implications and then the training implications for each. A few examples are presented in the results section and the complete list of solutions for each region is presented in Appendix A and B.

Overall discussion about extra skills-sets required under new model

Health needs planning and gap analysis for each community revealed a number of specific skills shortages, for example theatre nurses and allied health providers in Mareeba, and Aboriginal Health Workers and pharmacist in Yarrabah. In the current resource-tight financial environment, it is extremely important that each workforce solution is cost neutral at least. Thus, where possible, strategies for better use of existing health workforce were designed that involved more effective deployment or skills extension for members of the existing health workforce, or new workforce with plans to generate sufficient Medicare income to be cost neutral.

This planning considered the utilisation of new health worker roles involving more flexible task distribution such as Nurse Practitioners and Physician Assistants and an emphasis on multi-disciplinary teams in service and education. Ideas for these solutions were presented and refined with the informed input of the Clinical Reference Groups.

More detailed workforce calculations in key areas where models exist

One of the areas of deficiency in health workforce planning is empirical research linking the provision of best practice clinical care for a population of people with a particular condition with the number of person-hours in particular skills-sets required to provide it. The exception to this is work by Segal and colleagues in their WEB model for diabetes care (2, 16). This is a useful model for linking clinical guidelines around best practice in diabetes care with person-hours of particular competencies according to the underlying features of the population. We were able to adapt this model to the population of Mareeba, to do detailed workforce predictions in terms of diabetes care, both now, and projected forwards to 2021. This required workforce could then be compared to the existing workforce (across the whole community) possessing particular competencies, to allow some superficial consideration of workforce reconfiguration.

In particular, it is important to remember that in rural areas, every community cannot necessarily have one of each profession, thus it is important to consider multi-skilled health workers who can meet the needs of the population across several competencies. Examples of this include chronic disease Aboriginal and Torres Strait Islander Health Workers trained in retinal camera photography and foot assessment/footcare and allied health workers and assistants with skills across physiotherapy/OT and other rehabilitation skills (both with specialist allied health support from regional hubs). The roles of bringing in practice nurses or Nurse Practitioners with the capacity to bill Medicare for chronic disease care plans whilst meeting need is another attractive option.
Stage 4: Develop a workforce and training plan

Figure 7: Steps in stage 4 – Develop a workforce and training plan

- Identify additional sources of revenue and options for workforce configuration
- Identify existing and required training pathways
- Discuss with clinical reference group
- Implementing and evaluating solutions

The final stage (after another round of clinical reference group meetings) was the development of a workforce training and education plan which details and costs the training of an appropriate health workforce to serve population needs in these areas. This considered adequate support mechanisms (including professional development) for the rural health workforce, local training and providing alternative pathways that allow similar progression and development to their urban counterparts, in order to support recruitment and retention of local health workers and sustainability of the workforce into the future.

**Identify additional sources of revenue and options for workforce reconfiguration**

To deliver increased/reconfigured workforce in a cash-strapped system it was necessary to identify additional sources of revenue. Examples of this included the potential increased use of Medicare Extended Primary Care plans and health checks to generate Medicare income to employ more staff, and public-private partnerships to achieve increased efficiency. Optimal use of the COAG 19.2 exemption to allow Medicare billing in rural areas through Queensland Health services is also important, as is ensuring that every member of the healthcare team spends the majority of their time working at the upper limits of their scope-of-practice, with less complex tasks delegated to appropriately skilled mid-level providers.
Identify existing and required training pathways

One of the important steps in providing and maintaining an appropriately skilled health workforce in regional and rural areas is the provision of suitable training pathways for various health professionals. The next step of this process involved the identification and linkage of current training pathways. Initially, we focused on links with health professional training pathways (particularly those provided in the region by James Cook University) and their relationship to priority community needs and any gaps in these programs. All members of the Clinical Reference Groups at each site felt that development as a training hub would strengthen their workforce into the future. Thus, options for expanding clinical placement programs in nursing, medicine, dentistry, Physician Assistants and allied health were all considered. In addition, building a pipeline of postgraduate clinical training across disciplines in north Queensland was felt to be very important, so consideration of postgraduate training pathways (remotely or locally supervised) was included. Partnership with the Northern Clinical Training Network is important to facilitate this goal. A gap was identified in the provision of training for Aboriginal Health Workers with the collapse of the local regional training provider for health workers. A successful tender, led by JCU (with partners FNQ TAFE and QAIHC) and funded through HWA is potentially filling the need in this area, following the collapse a year ago of the only provider of Aboriginal Health Worker training in north Queensland.

Final clinical reference group meetings

Final clinical reference group meetings for each site considered the final workforce data from Stage 3, along with workforce and training plans. This facilitated local confirmation and modification of workforce and training plans (both with individual service providers and at whole clinical reference group level).

Implementation and evaluation of solutions

The project is now into the implementation and evaluation phase. Several of the solutions that have been developed through the course of this demonstration project are now underway, with several others under consideration by CHHHS Executive and others. Continued engagement with stakeholders to monitor the success of implementation and fully evaluate each of the solutions and workforce implications arising from this project will increase the transferability of the approach.
Barriers and enablers of project

This project has demonstrated that participatory health workforce planning is possible, based on strong and respectful partnerships between all stakeholders. Although complications can arise due to differences in funding models, employment conditions and inflexible information technology systems between service providers, these can all be overcome where there is a shared vision to innovate and a commitment to that process from all stakeholders.

Importantly, the motivation to engage in this process is common between all partners, and there is a desire to improve the health of rural populations through a strong, flexible, responsive and integrated healthcare system. Rigid silos of tasks within professions inhibit innovation, thus this project is considering required skill-sets and then configuring the healthcare workforce to deliver those combinations of skills. Emerging health workforce roles, including delegated practice models (Physician Assistants and expanded Indigenous Health Worker roles) and more flexible task allocation (for example utilising Nurse Practitioners, RIPERNs) are also likely to form an important part of a responsive health workforce. In addition, involvement from medical, nursing and allied health workers and strong mutually supportive links between primary care services and regional referral centres are vital, and all played a role in the success of this project.

Barriers encountered

Barriers we faced in the project included:

- Delays in obtaining final (Site Specific) Ethics approval through Queensland Health. This process took a total of 3 months, due to factors beyond our control including an unfilled research governance position within Queensland Health. The Human Research Ethics Committee approval was passed quickly, however the Site-Specific Assessment was quite slow, but is now finally all approved.
- Issues with gaining access to service utilisation and practice data for private providers. This is a problem common to much health services research. General practices and private allied health services are run as small businesses, and providers are understandably sensitive about allowing access to practice data (for a variety of confidentiality and commercial reasons). With practice consent we did obtain some service utilisation data (for general practice) through Medicare, however this is both expensive and time consuming. In the end we were able to negotiate access to service utilisation data from both private GP practices (but not yet from other private providers e.g. physiotherapists, psychologists etc). There were also initially a few issues in terms of access to potentially sensitive service utilisation data from Queensland Health, however high level engagement on the project team facilitated resolution of these issues.
- Part of working in a respectful and participatory way with communities entails working around community priorities in terms of the timing of project meetings. For example, due to an unexpected visit to Yarrabah by the QH Director General, we were forced to reschedule our planned first Clinical Reference Group meeting there. Flexibility in working with Aboriginal communities is required if there is “sorry business” or other cultural responsibilities within the community that we need to respect.
- Far North Queensland Medicare Local was still relatively new and evolving at the time of this project, resulting in difficulty in engaging them initially in this planning process and some uncertainty about their role in ongoing allied health service provision. In addition, they had done little population health planning at the time of the study.
- Some difficulties in getting prevalence data at local level.
- Absence of existing guidelines for health workforce required per population in terms of morbidity with the exception of diabetes mellitus.
• The period of this project coincided with a period of enormous instability and funding cuts within Cairns and Hinterland Hospital and Health Service with major job losses and reshuffles. This resulted in several changes in key personnel.

• Private GPs operate under a small business model, and had limited interest in any changes and difficulty in attending Clinical Reference Group meetings. Separate meetings scheduled at lunchtime overcame some of these issues, and ensured that the perspective of private practice providers were included in the planning.

• This is a small local project. Transferability and scaleability of the process seems likely, but this needs to be replicated in another region to ensure this.

• Both the timeline and budget for this project were insufficient for the work included. A significant co-contribution from JCU was required for successful completion.

**Enablers that facilitated successful completion**

Enablers to the project so far include:

• Close working relationship of all partners preceding the start of the project with an atmosphere of mutual respect.

• Good access overall to Queensland Health workforce, service utilisation and planning data.

• Engagement of local residents from both Mareeba and Yarrabah as project officers for this work to facilitate local engagement.

• Multidisciplinary central project team, with strong links and familiarity with project sites.

• Strong engagement of ACCHS sector representatives at both sites and high-level support from QAIHC.

• Broad participation in Clinical Reference Groups.

• Range of innovative solutions to real local problems, many of which are in the process of being implemented.

• Extremely high buy-in of senior stakeholders from CHHHS, each service and JCU, with a combined capacity to facilitate real change.

• Methodology that had enough structure for clarity, yet enough flexibility to adapt to local needs and context.

• Planning at regional level is entirely appropriate in terms of thinking about the healthcare system as a whole and the individual patient journey of people from the target communities when accessing healthcare from various parts of the health system. This level of planning will become increasingly important time with the increasing regionalisation of healthcare funding and planning mechanisms through HHs (LHHNs) and MLs.
Results from the project

Mareeba

The full community profile, health services map and needs assessment for Mareeba is presented at Appendix 1. Below a snapshot of findings from different stages is presented for Mareeba.

Needs assessment summary

- Growing population with high healthcare needs (low SES, high Indigenous population, correctional centre, high dependency ratio).
- High and increasing rates of chronic disease.
- Some difficulties in recruiting/retaining health workforce.
- Inefficiencies (and non-sustainability) in current service delivery eg. High preventable hospital admissions, both locally and at Cairns Base Hospital.
- Tight financial situation (especially QH).
- Largely good co-operation between different providers and willingness to work together for solutions.

Figure 8: Projected Number of Persons by Age with Diabetes: Mareeba 2011 and 2021

Prevalence of DM: 5.7 per cent of the population in 2011 (n=991) to 6.4 per cent in 2021 (n=1251) (based on NHS 2007 and 2011 data). After adjusting for Aboriginal and TSI population prevalence 7 per cent (n=1221) in 2011 and 7.7 per cent (n=1510) for 2021. In contrast there are 721 people on existing diabetes registers. Absolute number of people with End-Stage Kidney Disease (requiring dialysis) is predicted to increase from 29 in 2011 to 43 in 2021.
Local gaps identified

After presentation of all information and discussing this with the Clinical Reference Group in Mareeba, initial gaps in service delivery included:

- Overall lack of nursing (limited theatre usage) and allied health personnel (esp sonography and pharmacy) and specific workforce shortages at Mulungu (the local Aboriginal Community Controlled Health Service) and in private GP.
- Access to some specialist services and access to GP services (especially for non-Indigenous low income earners).
- Local dialysis services (patients need to travel to Atherton three times weekly).
- Growing demand for community palliative care and cancer services (need for a cancer care nurse coordinator).
- After hours mental health staffing (more presentations and transfers after 3 pm).
- On-site pathology services.
- Multiple poorly coordinated visits to Cairns for specialist services.
- Access to some specialist services and access to GP services.
Health service redesign

Figure 9: Health service redesign

Primary care elements not well integrated. Reliance on QH services for PHC as lack of options for low income earners.

Primary care | Secondary care/Mareeba Hospital | Tertiary care/CBH
---|---|---
GPs | Atherton Hospital | Multiple avoidable transfers for inpatient care
AICCHS | Mareeba Hospital | Avoidable outpatient and specialist visits.
NGOs | General led model of care. | Rising admission and cost for chronic disease management.
QH PHC | Staff Shortages limiting impact | Specialist outreach to Mareeba.
Hospital not always well coordinated.

Primary care | Secondary care/Mareeba Hospital | Tertiary care/CBH
---|---|---
ML | Atherton Hospital | CBH specialist support to Tablelands – outreach, Registrar post and telehealth
Private Allied Health | Mareeba Hospital | Reduced avoidable admissions and emergency transfers. Much specialist advice and follow-up provided through telehealth with some outreach visits.
General Practices | General led model of care. | GPs
AICCHS (home-style dialysis and oral health) | Increased local service provision with telehealth support | A/H mental Health.
NGOs | A/H mental Health. Nurse endoscopitis, efficient use of theatre. On site path | Nurse endoscopitis, efficient use of theatre. On site path
QH PHC | Streamlined communication b/n PC and CBH specialists - telemedicine support | Streamlined communication b/n PC and CBH specialists - telemedicine support

Expanded, Integrated PHC | Secondary care/Mareeba Hospital | Tertiary care/CBH
---|---|---
All residents have a medical home. Sharing services and records in care. Expanded community care provision - eg community cancer care coordinator, Consider vouchers for low income earners for GP/dental. | CBH specialist support to Tablelands – outreach, Registrar post and telehealth
General Practices | Reduced avoidable admissions and emergency transfers. Much specialist advice and follow-up provided through telehealth with some outreach visits. | General Practices
AICCHS (home-style dialysis and oral health) | Increased local service provision with telehealth support | A/H mental Health.
QH PHC | Streamlined communication b/n PC and CBH specialists - telemedicine support | Streamlined communication b/n PC and CBH specialists - telemedicine support

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Principles of health service redesign

- All residents have a clearly identified healthcare home (expanded role for GP in primary care).
- Better communication/integration between primary care providers (and between primary and secondary care – this may include patient held/shared records).
- More secondary services provided at Mareeba Hospital (as part of Mareeba/Atherton hub)
  - expanded surgical roster/nurse endoscopy.
  - onsite pathology.
  - A/H mental health support.
  - satellite dialysis (or at Mulungu or Lotus Glen correctional centre).
  - increased specialist support provided by telehealth.
- Expanded community care provision – eg. community cancer care coordinator role (for Tablelands).
- Expanded role of Medicare Local in community health promotion and filling gaps in allied health.
- Increased use of telehealth support to provide specialist services.
- Nurse-led chronic disease clinics to provide care to low income earners.
- Building on strengths in rural generalist and GP training in Mareeba, expand nursing, allied health and dentistry teaching in Mareeba.

Projected workforce competencies in particular areas

The table below applies Segal’s needs-driven evidence-based health workforce model for diabetes care to the current and projected Mareeba population with diabetes, adjusted for the number of Aboriginal and Torres Strait Islander residents. This model provides the number of full-time equivalent health workers (based on 40 hour week and 45 weeks per year) with competencies in a particular area required to provide care for the population of people with diabetes according to clinical best practice guidelines. It is assumed for this calculation that the characteristics and severity of diabetes/complications in the Mareeba population is similar to that of the overall Australian population with diabetes – this is likely to be an under-estimation of need. This required workforce can then be mapped against the current health workforce with particular competencies (whilst noting that this workforce must provide care for the entire Mareeba population – not just those people with diabetes).

Following this process suggests a number of options for workforce configuration – the most obvious skills shortages are in the area of nutrition care, lower limb care and diabetes education. Potential gains could be made through skilling up some Aboriginal Health Workers and/or community nurses to provide nutrition advice/support and foot assessment and advice under the supervision of specialist allied health providers in these areas. In many areas, particularly within the ACCHS sector, this is already occurring very successfully.
Table 2: Projected workforce competencies for managing care of Mareeba population with diabetes\textsuperscript{16}

<table>
<thead>
<tr>
<th>Competency</th>
<th>FTE/1000 Diabetics (Segal)</th>
<th>2011 Mareeba Adjusted FTE (Diabetics = 1221)</th>
<th>2021 Mareeba Adjusted FTE (Diabetics = 1510)</th>
<th>Current Workforce 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary advice and management</td>
<td>3.3</td>
<td>4.0</td>
<td>6.0</td>
<td>1.75</td>
</tr>
<tr>
<td>Home nursing</td>
<td>3.2</td>
<td>3.8</td>
<td>5.8</td>
<td>10+</td>
</tr>
<tr>
<td>Diabetes education</td>
<td>2.8</td>
<td>3.4</td>
<td>5.1</td>
<td>1.647</td>
</tr>
<tr>
<td>Preventative care and surveillance</td>
<td>2.0</td>
<td>2.5</td>
<td>3.7</td>
<td>1.75+</td>
</tr>
<tr>
<td>Exercise prescription and management</td>
<td>1.9</td>
<td>2.3</td>
<td>3.5</td>
<td>1</td>
</tr>
<tr>
<td>Psychological care</td>
<td>2.0</td>
<td>2.4</td>
<td>3.7</td>
<td>3.3+</td>
</tr>
<tr>
<td>Clinical medical care and case management</td>
<td>1.8</td>
<td>2.1</td>
<td>3.2</td>
<td>11.2+</td>
</tr>
<tr>
<td>Social support</td>
<td>1.6</td>
<td>1.9</td>
<td>2.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Lower limb care</td>
<td>1.3</td>
<td>1.5</td>
<td>2.3</td>
<td>0.194</td>
</tr>
<tr>
<td>Specialist pharmaceutical management</td>
<td>0.7</td>
<td>0.8</td>
<td>1.2</td>
<td>7</td>
</tr>
<tr>
<td>Ethnic/migrant cultural competence</td>
<td>0.5</td>
<td>0.5</td>
<td>0.8</td>
<td>12.6</td>
</tr>
<tr>
<td>Eye care</td>
<td>0.4</td>
<td>0.5</td>
<td>0.8</td>
<td>0</td>
</tr>
<tr>
<td>Dental care</td>
<td>0.4</td>
<td>0.4</td>
<td>0.7</td>
<td>2</td>
</tr>
<tr>
<td>Enabling functional independence</td>
<td>0.3</td>
<td>0.4</td>
<td>0.6</td>
<td>7</td>
</tr>
<tr>
<td>Orthotic support</td>
<td>0.2</td>
<td>0.2</td>
<td>0.3</td>
<td>3.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22.0</strong></td>
<td><strong>26.8</strong></td>
<td><strong>40.5</strong></td>
<td></td>
</tr>
</tbody>
</table>

This is the only specific needs-based health workforce model based on best practice clinical guidelines and applies only to one clinical condition. Whilst ideally this would be expanded to cover other areas of clinical need, this requires a time frame and resources far in excess of that available for this project. Through this project we believe that we have demonstrated the feasibility of a process of small area regional needs-based workforce planning that meets the needs of local communities and their health service districts, even in the absence of that level of quantitative detail across health conditions.

**Specific solutions**

Specific workforce and training solutions generated in partnership with local stakeholders across the various levels of care are reported in some detail in the Appendices. A summary only of the solutions and workforce implications and a case study of one of the solutions that is progressing is presented here (Figures 4, 5 and 6).
### Table 3: Mareeba Health Workforce: Future needs and training implications

<table>
<thead>
<tr>
<th>Health professional</th>
<th>Current status</th>
<th>Future workforce needs</th>
<th>Training implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doctors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Under capacity at Mulungu Aboriginal Medical Services</td>
<td>GP for Mulungu Rural Generalist with advanced surgical skills (Mareeba Hospital) Physician trainee Specialist services via tealehealth delivery</td>
<td>Rural generalists need to maintain skills therefore the development of Mareeba Hospital will provide a training hub for rural generalist trainees, RACP rural pathway trainees and ACRRM registrars. Continue to strengthen GP Registrar training through private GP and Mulungu. Acquire STP funding to establish Mareeba as a physician trainee rotation Train specialists and registrars to use telehealth more effectively; allow adequate time in roster to factor in telehealth appointments</td>
</tr>
<tr>
<td></td>
<td>Some gaps in hospital rural generalist advanced skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Irregular non-prioritised specialist visiting services</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nurses</strong></td>
<td></td>
<td>Cancer care co-ordinator Nurse Practitioner to help manage chronic disease clinic Surgical/ Theatre Nurses Mental Health Nurses Nurse educator at chronic disease clinic Practice nurse to assist private GPs with chronic disease management plans Telehealth co-ordinator nurse</td>
<td>Develop Rural Nurse Internship program at Mareeba Increase student placements at the chronic disease multi-disciplinary teaching clinic Rotate nurses from Cairns Hospital to boost capacity Training nurses in endoscopy (needs support from local gastroenterologists) Train ED nurses in additional MH competencies Telemedicine training for local nurses</td>
</tr>
<tr>
<td></td>
<td>Difficult to recruit and retain nursing staff at hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of specialised skilled nurses: eg. Surgical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of aged care enrolled nurses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No renal nurses (Mulungu/Lotus Glenn)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health professional</td>
<td>Current status</td>
<td>Future workforce needs</td>
<td>Training implications</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Aboriginal and Torres Strait Islander Health Workers</td>
<td>Under capacity for Aboriginal and Torres Strait Islander Health Workers (Mulungu) and community health workers (Community health centre, Mareeba Hospital)</td>
<td>Need more health workers to expand PHC provision in Mulungu and community health centre.</td>
<td>Work with JCU/QAIHC/FNQ TAFE on Aboriginal and Torres Strait Islander Health Worker up-skilling and training program. Mulungu ideal as a training site. Train Aboriginal and Torres Strait Islander Health Workers/community health workers with additional skills in eye and foot checks and nutrition. Train Aboriginal and Torres Strait Islander Health Workers to work with renal nurses in supporting dialysis</td>
</tr>
<tr>
<td>Allied Health</td>
<td>Limited capacity at the hospital Some visiting services for certain programs funded through the ML Lack of pathology services</td>
<td>Nutritionists Dieticians Podiatrists Phlebotomist/Lab technician Sonographer</td>
<td>Increase student placements at the chronic disease multi-disciplinary teaching clinic Develop rural allied health pathways eg. Cunningham centre Allied Health Rural Development pathway</td>
</tr>
<tr>
<td>Administrative staff</td>
<td>Some gaps</td>
<td>Temporary staff needed to help with registering patients for PCEHR though out all health providers. Co-ordinator for integrated appointment/transport system to allow better transport options to Cairns</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Table 4: Solutions 1. Expanding an integrated primary and community healthcare service

<table>
<thead>
<tr>
<th>Issues</th>
<th>Solutions</th>
<th>Workforce Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>High dependence by some residents on QH as source of primary care.</td>
<td>All residents have a clearly identified healthcare home (GP or ACCHS). Need provision of bulk-billed clinical services for low-income people not currently serviced. Consider impact of COAG 19.2 exemption allowing bulk billing of non-referred clinical services.</td>
<td>Increase clinical workforce for Mulungu – 1 doctor/GP registrar, practice nurse, Aboriginal and Torres Strait Islander Health Worker. Private GPs unable to fill this gap at present. Nurse-practitioner led community clinic (see solution 2).</td>
</tr>
<tr>
<td>Lack of access to bulk billed GP services.</td>
<td>Development of bulk-billed chronic multidisciplinary teaching clinic for low-income non-indigenous people. Following Barwon Health Kardinia clinic model. Consider voucher system to subsidise private GP attendance by low income earners.</td>
<td>0.6 GP time from QH (already allocated QH chronic disease clinic) and 1 FTE nurse time. Remaining FTE from rotating GP registrar position and employment of a nurse educator. Funded through EPC payment item numbers. Students (across provisions) to contribute to care provision. Medicare Local to contribute allied health supervision.</td>
</tr>
<tr>
<td>Insufficient coordination of cancer and palliative care services.</td>
<td>Expanded community care provision eg. Cancer care coordinator for Tabelands. Coordinated palliative care model so that care is coordinated around the patients (ie combine required trips to Cairns). Telehealth oncology solutions.</td>
<td>1 cancer care co-ordinator nurse position. Cost covered by savings in unnecessary transport to Cairns through expanded use of telehealth and better coordination of appointments</td>
</tr>
<tr>
<td>Current health information systems are not integrated reducing communication between services.</td>
<td>Better communication/integration between services through patient held records as patients use multiple services. Patient record systems across primary and secondary care need to be compatible. Computerised automatic discharge letter/note from electronic medical records.</td>
<td>Temporary extra administrative support rotating through Mulungu, QH and possibly private practice helping with patient registration for PCEHR. FNQ ML to facilitate as per Apunipima model. Ongoing IT systems support (FNQ ML).</td>
</tr>
<tr>
<td>Need to respond to growing population with chronic disease. Recent decimation of public health/community health services.</td>
<td>Integrated chronic disease care through multidisciplinary clinic Role for Medicare Local in community health promotion Council exploring funding sources/land for community health services/programs. Programs and facilities that focus on low income earners, nutrition, exercise to address obesity. Partnerships with Tabelands health reference group. Mobile services from Tabelands hub</td>
<td>Particular skills shortages in dietician/nutrition skills, diabetes education and foot care. FNQ ML assist with filling gaps in these areas through allied health program, whilst increasing skills-sets of 2-3 Aboriginal and Torres Strait Islander Health Workers and 1-2 community health workers through specific training in these areas under supervision of specialist allied health professionals. Available practitioners to provide services across sectors. Expanding Aboriginal and Torres Strait Islander Health Workers training.</td>
</tr>
<tr>
<td>Issues</td>
<td>Solutions</td>
<td>Workforce Implications</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Need to plan for increasing aged population; aged care services and accommodation.</td>
<td><strong>Tablelands aged care hub</strong> – community care coordination and increased residential and home care options. Increased residential beds on the Tablelands have opened during this project.</td>
<td>Will be ongoing need for training of aged care workers through FNQ TAFE as population ages. ACAT services with central care coordination nurse role – partnership between TRC and FNQ ML.</td>
</tr>
<tr>
<td>Travel to Atherton for dialysis.</td>
<td><strong>Dialysis service at Mulungu or Lotus Glen Correctional Service funded through public/private partnerships.</strong> Buddy-style dialysis with support from Atherton.</td>
<td>Need for two additional dialysis nurses. Also Aboriginal and Torres Strait Islander Health Workers trained in dialysis support skills and utilise existing training for carers. Machine maintenance through private provider.</td>
</tr>
</tbody>
</table>
## Table 5: Solutions 2. Reinforcing and expanding secondary care

<table>
<thead>
<tr>
<th>Issues</th>
<th>Solutions</th>
<th>Workforce Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing demand for admissions and high level care on Tablelands</td>
<td>Continue to strengthen generalist model offering full suite of services across Tablelands Hub, supported by CBH specialists</td>
<td>Currently adequate well-skilled rural generalist workforce in Mareeba. Sustainability and succession plans need to be ensured by continued development of Mareeba as a training hub for rural generalist trainees as well as RACGP rural pathway and ACRRM registrars. Medical student placements going well. Consider development of Mareeba as physician trainee rotation under STP program with remote supervision.</td>
</tr>
<tr>
<td>Lack of hospital nursing staff (especially theatre nurses) and allied health staff (in particular radiography/sonography, pharmacy, OT)</td>
<td>Develop comprehensive recruitment and retention plan for nursing workforce. Include further development as a teaching health system to build future workforce. Rotation/relieving system for nursing and allied health staff.</td>
<td>Expansion of Mareeba as a nursing training hub. Employment of nurse educator through chronic disease clinic. Rotation of CBH nurses through Mareeba whilst growing local capacity. Need to increase student numbers in nursing, allied health (esp dietician, OT, podiatry, dentistry) and Aboriginal Health Workers Recruitment for specific workforce gaps in sonography and pharmacy (through HWQ recruitment program).</td>
</tr>
<tr>
<td>Difficulties recruiting/retaining health workforce</td>
<td>Successful services offer good clinical management and supervision, clinical leadership, education and learning focus and research opportunities. New public/private partnerships to be explored for funding incentives to attract clinical staff eg scholarships or bursaries. Incentives for families of staff to help recruitment Need to develop nursing and medical leadership in the ED</td>
<td>Succession planning and development of Mareeba as centre of training excellence. This has been successful with medical workforce and needs replication with nursing and allied health workforce. Importance of clinical champions. Overall shortages are greatest in nursing and allied health workforce.</td>
</tr>
<tr>
<td>Clinical backlogs in particular areas</td>
<td>Develop and introduce new roles targeted at high demand. For example, implementation of nurse endoscopist role supported by local generalists and CBH gastroenterologists.</td>
<td>Training of 1-2 nurses in endoscopy. Currently requires travel to Logan or Melbourne for training. Support from local rural generalists or nurse anaesthetists in terms of sedation. Specialist support from CBH gastroenterologists.</td>
</tr>
<tr>
<td>Lack of on-site pathology services (only 9am–3pm service)</td>
<td>Onsite pathology service possibly through public/private partnership agreement</td>
<td>Phlebotomist and lab technician required.</td>
</tr>
</tbody>
</table>
### Table 6: Solutions 3. Reducing demand on tertiary services

<table>
<thead>
<tr>
<th>Issues</th>
<th>Solutions</th>
<th>Workforce Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaps in after-hours emergency mental healthcare (current service 9am-3pm)</td>
<td>Increase local mental health capacity through employment of skilled mental health nurses to avoid transfers</td>
<td>Need extra Mental Health Nurse Capacity in QH. MHN employed through FNQ ML to provide some after hour sessions. Amend rostering. ED nurses to be trained in additional MH competencies.</td>
</tr>
<tr>
<td>Access to specialist services inconsistent</td>
<td>Increased range of services provided through Mareeba Hospital via rural generalist training and advanced nursing. Coordinated access to specialist support provided through telehealth and outreach visits. Explore local physician trainee rotation.</td>
<td>More consistent visiting outreach services for general medicine and paediatrics and other specialties. Mareeba as location for STP physician trainee rotation with specialist supervision from CBH. Telemedicine clinics on a regular basis from Mareeba Hospital and private practice/Mulungu with specialists. One telehealth coordinator nurse required. Telemedicine training for local providers.</td>
</tr>
<tr>
<td>Visiting surgical list could be shared with Mareeba staff</td>
<td>Expanded local surgical roster to use available surgical and procedural skills more efficiently.</td>
<td>Limitation to doing this is theatre nurse workforce. Recruit 2-3 theatre nurses with incentives and rotate others from CBH. Surgical and anaesthetic skills available in local workforce. Plan complementary lists with Atherton Hospital.</td>
</tr>
<tr>
<td>No fracture clinic locally</td>
<td>Set up fracture clinic with telehealth support from CBH surgeons. This has been successfully implemented during the course of this project.</td>
<td>Nil – uses existing workforce entirely. Skills-set appropriate. Support in clinical decision-making from CBH orthopaedic surgeons.</td>
</tr>
<tr>
<td>Large numbers of CBH outpatient appointments</td>
<td>Provide pre-operative or follow-up care through share care model at Mareeba, or in General Practice Coordinated appointment system for Tablelands patients to allow improved transport options to Cairns.</td>
<td>1 administrator (ideally with clinical background) to coordinate appointments and transport with CBH and Mareeba providers.</td>
</tr>
</tbody>
</table>
Sample solution: Development of interdisciplinary teaching clinic for provision of chronic disease care for low income clients without a healthcare home

There are a group of people in Mareeba who attend the hospital for acute care and have no usual healthcare home. These people tend to be low income earners who are neither Aboriginal nor Torres Strait Islander and are unwilling or unable to pay gap fees to see GPs in the district. The only bulk billing practice in the community is the Aboriginal and Torres Strait Islander Community Controlled Health Service. The result is that these people are getting very much sicker and are eventually costing the system a lot more. A combined solution to this issue and the issue of expanding Mareeba as a clinical teaching site across disciplines (as a strategy for building current and future workforce) is the idea of a bulk-billing multidisciplinary teaching clinic. The proposal is to expand the chronic disease clinic using the services of health professional students in the latter stages of training (nursing, medical, physiotherapy, occupational therapy, pharmacy and physicians assistant), with the dual goals of expanding services to patients and increasing access to interdisciplinary training for JCU health profession students. The business model will be informed by that of Kardinia Healthcare – with discussions ongoing with Medical Director, Dr Lou Sanderson (http://www.kardiniahealth.com.au/).

The vision is for the creation of a clinical learning centre providing chronic disease management to low-income earners of Mareeba and surrounding districts who do not currently attend General Practices in the region. It is an active partnership between Mareeba Hospital, JCU, Tablelands Council, Mulungu, FNQ Medicare Local and private practices, that may operate out of the previous Mulungu premises, and use some QH nurse and doctor time with private GP Registrar time and a coordinating nurse practitioner. An action research process will be established to evaluate and develop the clinic to improve clinical effectiveness and the student experience.

Yarrabah

The full community profile, health services map and needs assessment for Yarrabah is presented at Appendix 2. Below a snapshot of findings from different stages is presented for Yarrabah.

Needs assessment summary

- Extremely disadvantaged community on all indicators.
- Transition process (from Queensland Health provided services to Aboriginal community-controlled health services) still lacks clarity and timeline.
- High and increasing rates of chronic disease (especially CKD).
- Large numbers of children and young people with prevention/health promotion needs.
- Difficulties in recruiting/retaining health workforce (especially Aboriginal Health Workers).
- Lack of health promotion services and attention to social determinants of health.
- Inefficiencies in current service delivery, particularly integration of visiting services.
- Financial limitations. Gurriny Yealamucka needs more health workers to optimise Medicare billing capacity.
- Largely good co-operation between different providers and willingness to work together for solutions.
Local gaps identified

After presentation of all information and discussing this with the Clinical Reference Group in Yarrabah, initial gaps in service delivery included:

- Clarity and finalisation of transition process to reduce uncertainty for staff and allow integrated planning.
- Integrated responses to rising rates of chronic disease, with a focus on health promotion and prevention, and excellent, systematised primary and secondary disease care. Strengthening the use of electronic clinical records and evaluating progress is considered an important part of this.
- Local dialysis services to reduce load on transport.
- Comprehensive child and youth services with a focus on intersectoral programs focussing on prevention and health promotion (and early intervention where problems are detected).
- Local pharmacy services.
- Consistency of workforce. In particular a need was identified for training and support for Aboriginal Health Workers to support their professional development and improve retention.
- Cancer and palliative care services needed to be strengthened.
- Allied health. Availability of visiting allied health services was poorly coordinated and insufficient to meet growing needs.
- Local clinicians and local residents seem to agree in terms of priority issues.
Health service redesign

Figure 11: Health service redesign

Primary care elements not well integrated.
Partial transition to community control

Multiple avoidable transfers for inpatient care
Avoidable outpatient and specialist visits.
Rising admission and cost for chronic disease management.
Specialist outreach to Yarrabah not always well coordinated.

Avoidable emergency transfers

Dialysis

Some specialist outreach and OP referrals

Primary care
Secondary care – QH/Edmonton
Tertiary care/CBH

Expanded, Integrated PHC
Secondary care – QH/Edmonton
Tertiary care/CBH/QH

Avoidable transfers for inpatient care

Support for aged and disability services, palliative care, allied health.
Dialysis support

Reduced avoidable transfers for inpatient care and specialist visits.
Controlled admissions.
Coordinated specialist support to Yarrabah through outreach clinics supplemented with telehealth care.

Reduced avoidable emergency transfers

Some specialist outreach and OP referrals
Principles for health service redesign

Features of proposed model for Yarrabah include the following vital components:

- Integrated comprehensive primary healthcare service with transition to community control complete.
- Strong intersectoral links between primary healthcare and school, community services and housing.
- Expansion and strengthening of chronic disease and child health teams - quality, systematised multidisciplinary care provision.
- Increased use of care plans and Indigenous health checks to finance more positions and programs.
- On-site dialysis using Kimberley model (mixed funding model – trained buddy support and/or nurse or Aboriginal and Torres Strait Islander Health Worker trained in dialysis support, supported from Edmonton).
- Increased use of QH services located in Edmonton and Gordonvale for secondary care and support.
- Increased local pharmacy support.
- Expansion of aged care/disability support.
- Expansion as centre of training excellence for Aboriginal and Torres Strait Islander Health Workers – training, support and career pathways.

Specific solutions

Specific workforce and training solutions generated in partnership with local stakeholders across the various levels of care are reported in some detail in the Appendices. A summary only of the health service and workforce solutions and a case study of one of the solutions that is progressing is presented here.
<table>
<thead>
<tr>
<th>Health professional</th>
<th>Current status</th>
<th>Future workforce needs</th>
<th>Training implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctors</td>
<td>Sufficient at present, but still split between Gurriny and QH</td>
<td>Fragile workforce Needs succession planning to ensure workforce sustainability post transition.</td>
<td>Increase GP registrars and academic registrars. Possible expanded role in medical student training. Need doctors with public health/PHC skills and also with emergency skills to cover after hours.</td>
</tr>
<tr>
<td>Nurses</td>
<td>Limited at Gurriny. Sufficient working from QH. One dialysis trained nurse on site.</td>
<td>Ideally would have at least two NPs – one for chronic disease and one for child and youth health. Possible re-allocation of existing QH nurses.</td>
<td>Role for nurse educator to expand Yarrabah as a training site (role in teaching nursing students and Aboriginal and Torres Strait Islander Health Workers).</td>
</tr>
<tr>
<td>Aboriginal and Torres Strait Islander Health Workers</td>
<td>Insufficient Aboriginal and Torres Strait Islander Health Workers at present. Difficulty in attracting and retaining them in the workforce.</td>
<td>Need at least 6-8 more health workers to expand PHC provision. Need career progression and training pathways for Aboriginal and Torres Strait Islander Health Workers</td>
<td>Work with JCU/QAIHC/FNQ TAFE on Aboriginal and Torres Strait Islander Health Worker up-skilling and training program. Yarrabah as site. Train Aboriginal and Torres Strait Islander Health Workers with additional skills in eye and foot checks and nutrition. Train Aboriginal and Torres Strait Islander Health Workers as Ambulance assistants.</td>
</tr>
<tr>
<td>Allied Health</td>
<td>None on site. Visiting services limited. Lacks pharmacy.</td>
<td>Need local pharmacist. Coordinated visiting services.</td>
<td>Train Aboriginal and Torres Strait Islander Health Workers as allied health assistants.</td>
</tr>
</tbody>
</table>
Table 8: Solutions 1: Expanding an integrated primary and community healthcare service

<table>
<thead>
<tr>
<th>Issues</th>
<th>Solutions</th>
<th>Workforce Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for expanded and systematised management of chronic disease to keep up with growing demand</td>
<td>Using integrated diabetes care plans (on-line and accessed by all service stakeholders) for PHC oriented diabetes care. Aboriginal and Torres Strait Islander Health Workers with skills in eye and foot checks. Telehealth specialist advice from Cairns diabetes centre available. Create NP or Practice Nurse role to manage diabetes care plans Better utilisation of Close the Gap program through ML. Community empowerment and health promotion programs.</td>
<td>Medical workforce adequate. Needs employment of 1 practice nurse or nurse practitioner as chronic disease coordinator. Financed through EPC care plans. Need additional 1-2 Aboriginal and Torres Strait Islander Health Workers for chronic disease team. Train in extended chronic disease competencies – foot care, nutrition, retinal camera photography. Coordinated chronic disease clinics with visiting allied health services. Coordination of FNQ ML Close the Gap Program for filling skills gaps.</td>
</tr>
<tr>
<td>Lack of integrated child and youth health programs</td>
<td>Maximise revenue through health check Medicare billing potential. Support Aboriginal and Torres Strait Islander Health Worker roles located in schools and strong intersectoral links. Create NP role to manage healthcare checks in tandem with GP.</td>
<td>Additional Aboriginal and Torres Strait Islander Health Workers employed to work in school. Child health nurse to coordinate child and youth health checks in coordination with GPs (on existing work plan – billings will fund additional Aboriginal and Torres Strait Islander Health Workers). Closer work with psychology services provided through Q Ed.</td>
</tr>
<tr>
<td>Staff shortages/ issues with recruitment and retention (particularly acute for Aboriginal and Torres Strait Islander Health Workers)</td>
<td>Recruit, train and support Aboriginal and Torres Strait Islander Health Workers through establishment of a centre of training excellence for Aboriginal health workers. Link to existing JCU training pathways in other disciplines. Role for Medicare Local in filling known gaps, especially Allied Health.</td>
<td>Recruitment of nurse educator for Yarrabah to provide support and education for current and potential Aboriginal and Torres Strait Islander Health Workers and training for rotating nursing students. Expansion of Yarrabah as a site for GP Registrar and medical student placements to assist with workforce and medical workforce sustainability. Link in with JCU/FNQ partnership centre for upskilling of Aboriginal and Torres Strait Islander Health Workers towards national registration. Cohort training to be provided at Yarrabah. Provide career pathways and support for Aboriginal and Torres Strait Islander Health Workers.</td>
</tr>
</tbody>
</table>
### Table 9: Solutions 2: reinforcing and expanding secondary care

<table>
<thead>
<tr>
<th>Issues</th>
<th>Solutions</th>
<th>Workforce Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited integration between the two service providers. Partial transition to community control creates uncertainty about processes and timeframes</td>
<td><strong>Joint transition plan with clear milestones for delivery of joint model of care, co-ordination of human resource support services and innovative shared IT system planning</strong></td>
<td>Transition coordinator in place and fulfilling an important role in progressing.</td>
</tr>
<tr>
<td>High cost of transferring patients to Cairns for renal dialysis, also dominates available transport resources for Gurriny Yuelamucka</td>
<td><strong>Locating renal dialysis services in Yarrabah through the implementation of a public-private funded “Kimberley model”.</strong> Training locally based community and/or family members to become trained support “buddies” Trained specialist dialysis support could also be provided through the Edmonton secondary care facility instead of Cairns.</td>
<td>One existing dialysis–trained nurse already works at Yarrabah. Need to train one further nurse and 2 Aboriginal and Torres Strait Islander Health Workers in dialysis support. Also provide training through Cairns renal centre for family members of those on dialysis or other community members to be dialysis support “buddies”. Renal physician backup from CBH. Machine maintenance provided by private company.</td>
</tr>
<tr>
<td>Limited pharmacy services</td>
<td><strong>Sublease rental agreement for Yarrabah. Increased revenue through take-up of Medicare funded medication review plans</strong></td>
<td>Pharmacist needed in Yarrabah to staff new pharmacy. Provided on rotation basis from Edmonton.</td>
</tr>
<tr>
<td>Lack of local high-level aged care places. Lack of disability/respite support services</td>
<td><strong>Expand the respite, palliative care and additional community support services that can be provided from Edmonton and Gordonvale services as opposed to Cairns. Train Aboriginal and Torres Strait Islander Health Workers with advanced skills in these areas. More allied health service provision through FNQ Medicare Local</strong></td>
<td>Adequate staffing currently at Aged Care service but needs to grow in future. Train Aboriginal and Torres Strait Islander Health Workers with special skills in palliative care/respite care to work with support from Gordonvale QH providers. Allied health assistant role to be developed through training Aboriginal and Torres Strait Islander Health Workers. Use NDIS to fund additional disability services.</td>
</tr>
</tbody>
</table>
Table 10: Solutions 3: Reducing demand on tertiary services

<table>
<thead>
<tr>
<th>Issues</th>
<th>Solutions</th>
<th>Workforce Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>High volume of costly ambulance transfers and lack of paramedical staff</td>
<td><strong>With expanded skill-sets and remote support</strong> of the primary care team, a range of services currently requiring specialist outpatient review at Cairns (or Yarrabah outreach services) could be provided in the community. <strong>Telehealth consultations</strong> to minimise unnecessary follow-up visits and support staff in managing emergencies. Consideration of Aboriginal and Torres Strait Islander Health Worker ambulance assistant role to assist with transport.</td>
<td>1 Aboriginal and Torres Strait Islander Health Worker trained as an ambulance assistant to accompany paramedic with transfers. Could be funded through cost savings in nurse time previously accompanying transfers. Increased provision of telehealth support for routine consultations or postoperative reviews. May need employment of 1 administrator to streamline appointments between CBH and local providers. Telehealth coordinator from Cairns Diabetes Centre to provide training and support.</td>
</tr>
<tr>
<td>High volume of poorly coordinated visiting allied health and specialist services</td>
<td><strong>Increased utilisation of telehealth</strong> would also reduce present volume of transfers with specialist services providing support to appropriately trained locally based GPs and nurses. Allied health visits coordinated with chronic disease/child health/rehabilitation clinics</td>
<td>As above. Coordination of visiting clinics between QH, Gurriny and FNQ Medicare Local for optimum efficiency. Visiting allied health providers to support local Aboriginal and Torres Strait Islander Health Workers/allied health assistants in care provision. Routine pre and postoperative visits or medical review visits could be conducted by planned telehealth consultation in conjunction with local health workers.</td>
</tr>
<tr>
<td>Growing ambulatory care sensitive admissions</td>
<td><strong>Strengthened primary care services</strong> reducing acute admission requirements</td>
<td>Adequate medical workforce currently. Need to ensure sustainability (especially for after hours services) through expanded role as a clinical training site. Additional Aboriginal and Torres Strait Islander Health Workers and community nurses/NPs would enable more efficient primary care delivery, through strengthened care coordination and outreach care provision.</td>
</tr>
</tbody>
</table>
Transporting renal dialysis patients to Cairns 3 times per week per patient is problematic on several levels. The GYHSAC minibus only has places for maximum of 11 people, there are currently 13/14 requiring dialysis treatment. Due to the length and frequency of the treatment this monopolises the transport resources available to Gurriny on at least 3 days per week. Patient health is also compromised by spending lengthy amounts of time in transit and a treatment that is hospital based and provided entirely by non-indigenous heath personnel. In addition, there are limited renal dialysis chairs available in Cairns: 23 in total between the private and public hospitals combined. By 2014, 18 patients could require 3 treatments per week. Demand is predicted to rise at a rate of 2 – 4 patients per year over the next 10 years.

Locating renal services locally in the Yarrabah health facility with a private company (such as Fresinious http://fmc-au.com/) providing and maintaining the equipment and staffed by a mix of renal nurses and renal trained Aboriginal and Torres Strait Islander Health Workers/Buddies would improve patient care, reduce transport costs, reduce on-going costs ($67,000 per patient per year in contrast to $100,000 per year in Cairns renal unit) and release much needed renal dialysis places back to the Cairns community. This model could be developed based on the Kimberley model (http://www.kamsc.org.au/research/Completed_Projects/HD_Study.html) with proven safety and efficacy.

Rather than employing only renal nurses to administer the treatment it would be preferable to train people locally; either Aboriginal Health Workers or family members willing to be paid buddies. They could work in tandem with the renal nurses. Full budgeting for this process is included in the appendices. Cairns Hospital already provides some training for dialysis buddies. Skills in this area could also be incorporated into ABORIGINAL AND TORRES STRAIT ISLANDER HEALTH WORKER upskilling and training to be provided through a partnership between JCU, FNQ TAFE, QAIHC and funded by JCU. After having been presented with this evidence and a potential solution, service providers at Yarrabah, together with CHHHS executive team are working to implement this model at Yarrabah. This is potentially the first of many communities where such an approach may be appropriate.
Implementation and further work

This demonstration model of regional health workforce planning has provided a description of a process of participatory health service and health workforce planning for local healthcare providers in conjunction with their regional referral centre, in addition to comprehensive workforce and training plans for the participating communities. This process, building upon the CHHHS health service plan 2012-26 has resulted in a gap analysis of the current model of service and associated health workforce, predicted demand for health workforce taking into account community profiles and needs assessment, current and projected and devised solutions to a comprehensive list of issues regarding health service delivery in the communities. Underlying successful health provision in the communities is the desire by the local health providers to strengthen the primary healthcare sector and its integration with secondary and tertiary care.

This process is now ready for replication in other jurisdictions, with appropriate adjustments for local needs. The focus of the research on how significant Indigenous health services within the chosen communities can successfully interact with other local service providers has produced evidence based best-practice service models for other similar rural communities where the imminent integration of health services is high on the agenda. It is of great interest to Medicare Locals as part of their core business to engage in community based health needs assessment to inform population health planning.

Although unforeseen at the outset of this project, the structure of how health services are delivered to the community has undergone rapid change over the last 12 months. Since the beginning of financial year 2012/13 a new Cairns and Hinterland Health and Hospital Service (CHHHS) Board was appointed and a Medicare Local established. Extensive cuts to health spending have since taken place. In turn, many primary healthcare services, such as community and public health formerly under the auspice of the CHHHS, have been closed with the loss and restructure of many jobs. Functions such as health planning and strategic management, formerly undertaken in Brisbane, have also been lost. The emphasis on financial constraints has resulted in an “accountant driven” model. The resulting changing landscape in the field of health provision has been a challenge to the project in terms of continuity of stakeholders and demanding attention from the CHHHS and ML. Despite these challenges we have been able to successfully bring together all the stakeholders and service providers in both project sites and work through a process of health needs assessment, service gap analysis, developing and designing potential solutions. Lessons from the process of doing this will be of use more broadly. Many of the health service and workforce solutions suggested throughout the consultation process of the project are underway. For example, the fracture clinic in Mareeba hospital is already operational, and the funding proposal to deliver dialysis through a public-private partnership (as already happens in the Kimberley) is being implemented in Yarrabah. The work has been presented to the CHHHS Executive Team and the Mackay Hospital and Health Service Board, as well as stakeholders and clinical reference groups.

The team has been asked by several of the health providers involved to be a part of their ongoing planning process and provide research expertise into developing further funding proposals and implementation plans. The team has also been approached by other health service planners locally to form a local governance structure for the region. This will provide an integrated approach to health workforce planning in the area and a forum where ideas and research can be shared. Multiple funding sources with separate agendas and accountabilities (and accompanying diverse organisational cultures) can and have resulted in a disjointed approach to health service workforce planning. It has also resulted in the duplication of tasks. However, locally this can be overcome by strong governance and an integrated joint stakeholder approach to health service and workforce planning. The proposed blueprint from the state government expresses a desire to enter into more public/private partnerships in health provision which may provide opportunities to deliver healthcare more efficiently. The team believes that the work and partnerships formed during this project has provided a strong basis to be an integral part of implementing such an initiative, whilst adding considerable value to the investment made thus far. Implementation and evaluation of the solutions provided are a logical next step at a regional and local level.
Develop model into an integrated regional workforce planning toolkit

Building upon this pilot project the same model can be used in other regional communities throughout Australia to inform health workforce planning. This will allow stronger conclusions to be drawn in terms of the generalisability of the process, through testing it in range of different rural communities and settings. The traditional approach of central health service planners (capital city based) is very much present in another local HHS in Mackay, north Queensland. Plans are currently under discussion to close some of the smaller rural hospitals and transfer resources to the regional tertiary hospital in Mackay, despite the fact that some of the communities have rapidly growing populations due to the mining boom. Lack of integration between privately provided services to support the mining industry and government supported services is a particular problem in this region. Some of the communities under threat face a 4.5 hour round trip to Mackay to access other health services. The consultation in the pilot project has proven that this is not beneficial to the community and will result in poorer health outcomes. The pilot project has also suggested workforce solutions that can overcome the difficulties of recruiting health workers to rural communities.

Despite the success of the project in Cairns HHS, two limitations of the this project were the dramatic changes occurring within Queensland Health at the time and the extremely early developmental stage of the local Medicare Local, limiting contact at governance level. Integration and solid governance have been proved key to successfully planning health services and health workforce; a more ambitious analysis could therefore examine the relationship between Mackay and 4 communities with satellite hospitals and a range of other health services all located within 1-2 hours drive of Mackay. These represent a range of diverse communities, thus allowing us to adapt our methodology to a range of settings, and refine the process to a generalisable set of processes that can be implemented in a range of settings around the country.

The Townsville Mackay Medicare Local (TMML) has been in operation for two years already and is functioning at an advanced level with more than 100 employees across the region. TMML has already undertaken population needs assessments in these communities and mapped resulting gaps in health workforce. This would allow the process of regional health workforce planning to begin at the workforce solutions stage and look at drafting implementation strategies from the outset – including liaising with decision makers about financial implications and development of funding applications. With direct representatives on both the HHS and ML boards project recommendations could be fast-tracked to the decision-makers and emphasis put upon forming an integrated regional workforce planning group – encompassing representatives of all health service providers involved – developed from the outset. In addition, the Northern Clinical Training Network is also more active in Mackay with several staff members located in this region.

So, in summary the local next steps for this process are:

1. Replication and verification of the processes.

2. Developing a needs-based regional level health workforce planning tool-kit.

Replicating and verifying the processes used for collaborative regional health workforce planning in the demonstration project in another region and with different types of communities is the next sensible step. There are some advantages in working with Mackay region in terms of a more developed Medicare Local and population health profiles in existence. This would enable generalisation of the process and plan for use more widely in other contexts around the country.
Through applying the model with different communities in another region we will also be able to produce a deliverable of a toolkit for working with communities, managers and healthcare providers to conduct needs based health assessments, consider gaps in current services, reconfigure health services and implement health workforce and training plans to deliver those changes.

This project builds on Australian primary healthcare reform and work undertaken in the United States of America about medical homes and general appreciation of need to move towards a more generalist-focused approach to providing health services, with an approach based on skills-sets rather than occupational silos. This kind of needs-based regionally led health workforce planning (with local flexibility to implement solutions) is becoming increasingly relevant with increasing regionalisation of health planning and funding at both primary and tertiary levels. We believe that this work complements the large scale aggregate workforce projection models currently used by HWA.
Conclusion and next steps

1. Needs-based loco-regional health workforce planning is possible and highly acceptable, through participatory processes with all stakeholders involving systems thinking and creativity unbound by current funding or governance streams or disciplinary silos.

2. Real health systems and workforce and training solutions can be delivered by facilitating linkages and processes involving healthcare providers from all disciplines and health sectors in a planning process based on needs of community members. These include public-private partnerships in service provision models, telehealth solutions, task substitution and redistribution and increased use of delegated practice models, all aimed at meeting community needs.

3. High level management and governance support for the process from LHHNs and ML executives and boards and key local service provider champions are important facilitators of the process.

4. Although most healthcare providers are supportive of this process, some challenges remain in engaging private providers of primary care services in general practice and allied health in these collaborative processes. Creative thinking is necessary to tailor locally acceptable solutions in a non-competitive fashion.

5. Increasing regionalisation and decentralisation of health funding, planning and accountability strengthens the case for this kind of a process, which complements the large-scale aggregate health workforce planning done by HWA.

6. Workforce planners, educators and training providers need to think more in terms of competencies and skills-sets required to meet population health needs rather than qualifications. Planning must address current workforce needs, but also training and support to ensure sustainability of the health workforce into the future. Partnerships with universities and other providers of tertiary training of the health workforce are an essential part of this process.

7. Next steps involve replication of this process in another LHHN/ML region and with different communities. Through applying the model with different communities in another region we will be able to produce a generalisable Toolkit for Participatory Regional Needs-Based Health Workforce Planning, including guidance and a set of tools for working with communities, managers and healthcare providers. This could be used for conducting needs based health assessments, considering gaps in current services, reconfiguring health services and implementing health workforce and training plans to deliver those changes.
Appendix A – Mareeba Solutions

Expanding an integrated primary and community healthcare service

P1: Integration of chronic disease care through General Practice Clinics and the Aboriginal Community Controlled Health Service (ACCHS)

Issues

One of the largest issues in the community is the high prevalence of chronic disease coupled with an ageing population. The provision of services to address rising levels of chronic disease has been flagged as an area for action in the TRC Tablelands Community Plan 2021. Discussion with all health service providers in the community has led to the following issues being identified:

- Variable use of Enhanced Primary Care (EPC) Chronic Disease management item numbers.
- Limited local access to allied health professionals.
- Infrastructure limitations on expansion of private primary care and in particular chronic disease services. More chronic disease activity may be possible if space issues resolved.
- State Government recent reduction of public and community health workforce e.g. community nutrition position has been made redundant.
- Tablelands Regional Council recent loss of Community Development Officer and current de-amalgamation may threaten further planning and community development positions and ability to respond to public health issues.

Chronic medical conditions are responsible for over 80 per cent of the overall burden of disease and injury in Australia. Chronic disease, particularly diabetes, contributes to two thirds of premature deaths amongst Aboriginal and Torres Strait islander people. Whilst social, cultural and environmental issues are significant contributors to health outcomes, improvements in health can be impeded by system and service limitations. Chronic diseases have common risk factors: smoking, poor nutrition, and lack of exercise however much of this risk can be prevented and managed with better access to health services, education and lifestyle support. Recommended best practice in chronic disease management involves coordinated care by multidisciplinary teams.

Supporting data

Medicare statistics indicate that overall uptake by GPs of GP Management Plans and Team Care Arrangement items (required precursors for subsidised allied health referrals), is low. The annual, average number of GP Management Plans prepared by each GP nationally was 22 in one year.
Table 11: Estimated Medicare Billing

<table>
<thead>
<tr>
<th></th>
<th>Practice 1</th>
<th>Practice 2</th>
<th>AMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>701, 703, 705, 707</td>
<td>Brief, Standard, Long and Prolonged Health Assessment by a medical practitioner</td>
<td>160</td>
<td>96</td>
</tr>
<tr>
<td>715</td>
<td>Aboriginal and Torres Strait Islander Peoples Health Assessment</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>721</td>
<td>GP Management Plan (Chronic Disease)</td>
<td>127 (23.5/GP/Yr)</td>
<td>96 (53.3/GP/Yr)</td>
</tr>
<tr>
<td>723</td>
<td>Coordination of team care arrangement by general practitioner</td>
<td>119 (22.0/GP/Yr)</td>
<td>84 (46.7/GP/Yr)</td>
</tr>
<tr>
<td>Total Patients</td>
<td></td>
<td>13376</td>
<td>3590</td>
</tr>
<tr>
<td>Total GPs</td>
<td></td>
<td>5.4 FTE</td>
<td>1.8 FTE</td>
</tr>
</tbody>
</table>

In 2009-10 the Cairns and Hinterland Hospital and Health Service reported that chronic diseases and their complications accounted for a significant number of potentially preventable hospitalisations (PPHs) (Queensland Health 2012). The three largest causes of PPHs in the District were: complications of diabetes; chronic obstructive pulmonary disease; and dental conditions (Queensland Health 2012).

Table 12: ACCHS Chronic Disease Profile

<table>
<thead>
<tr>
<th>Total patient population with chronic disease (N=2170)</th>
<th>National Prevalence (2007-08)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>259 (11.9%)</td>
</tr>
<tr>
<td>COPD</td>
<td>94 (4.3%)</td>
</tr>
<tr>
<td>CHD</td>
<td>119 (5.5%)</td>
</tr>
<tr>
<td>Stroke</td>
<td>34 (1.6%)</td>
</tr>
<tr>
<td>Renal Impairment</td>
<td>65 (3.0%)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>340 (15.7%)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>255 (11.8%)</td>
</tr>
<tr>
<td>Mental Health</td>
<td>174 (8.0%)</td>
</tr>
<tr>
<td>Bone and Joint Disease</td>
<td>120 (5.5%)</td>
</tr>
</tbody>
</table>

Diabetes prevalence estimates and projections for Mareeba estimate the prevalence increasing from 5.7 per cent of the population in 2011 (n=991) to 6.4 per cent in 2021 (n=1251). Adjusting for the higher Indigenous population in Mareeba results in a prevalence estimate of 7 per cent (n=1221) in 2011 and 7.7 per cent (n=1510) for 2021. Estimates from local health service registers (AMS and Practice 1) indicate approximately 631 people with diabetes with an additional 120 residents on the Hospital chronic disease register in 2011.

Primary care workforce modelling using Segal et al. Diabetes modelling methodology\textsuperscript{17} for best practice diabetes care has been applied to the Mareeba current and projected population with diabetes. The current total health workforce in Mareeba is provided for a comparison (although it needs to be remembered that this workforce provides care for the entire population of Mareeba, not just those with diabetes. All competencies which may be involved in the care of people with chronic disease were included however it was not possible to provide an estimate of the percentage of time each position spends specifically on diabetes care.

Figure 13: Projected number of persons with diabetes: Mareeba 2011 and 2021
Table 13: Projected workforce competencies for managing care of Mareeba population with diabetes\textsuperscript{16}

<table>
<thead>
<tr>
<th>Competency</th>
<th>FTE/1000 Diabetics (Segal)</th>
<th>2011 Mareeba Adjusted FTE (Diabetics = 1221)</th>
<th>2021 Mareeba Adjusted FTE (Diabetics = 1510)</th>
<th>Current Workforce 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary advice and management</td>
<td>3.3</td>
<td>4.0</td>
<td>6.0</td>
<td>1.75</td>
</tr>
<tr>
<td>Home nursing</td>
<td>3.2</td>
<td>3.8</td>
<td>5.8</td>
<td>10+</td>
</tr>
<tr>
<td>Diabetes education</td>
<td>2.8</td>
<td>3.4</td>
<td>5.1</td>
<td>1.647</td>
</tr>
<tr>
<td>Preventative care and surveillance</td>
<td>2.0</td>
<td>2.5</td>
<td>3.7</td>
<td>1.75+</td>
</tr>
<tr>
<td>Exercise prescription and management</td>
<td>1.9</td>
<td>2.3</td>
<td>3.5</td>
<td>1</td>
</tr>
<tr>
<td>Psychological care</td>
<td>2.0</td>
<td>2.4</td>
<td>3.7</td>
<td>3.3+</td>
</tr>
<tr>
<td>Clinical medical care and case management</td>
<td>1.8</td>
<td>2.1</td>
<td>3.2</td>
<td>11.2+</td>
</tr>
<tr>
<td>Social support</td>
<td>1.6</td>
<td>1.9</td>
<td>2.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Lower limb care</td>
<td>1.3</td>
<td>1.5</td>
<td>2.3</td>
<td>0.194</td>
</tr>
<tr>
<td>Specialist pharmaceutical management</td>
<td>0.7</td>
<td>0.8</td>
<td>1.2</td>
<td>7</td>
</tr>
<tr>
<td>Ethnic/migrant cultural competence</td>
<td>0.5</td>
<td>0.5</td>
<td>0.8</td>
<td>12.6</td>
</tr>
<tr>
<td>Eye care</td>
<td>0.4</td>
<td>0.5</td>
<td>0.8</td>
<td>0</td>
</tr>
<tr>
<td>Dental care</td>
<td>0.4</td>
<td>0.4</td>
<td>0.7</td>
<td>2</td>
</tr>
<tr>
<td>Enabling functional independence</td>
<td>0.3</td>
<td>0.4</td>
<td>0.6</td>
<td>7</td>
</tr>
<tr>
<td>Orthotic support</td>
<td>0.2</td>
<td>0.2</td>
<td>0.3</td>
<td>3.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22.0</strong></td>
<td><strong>26.8</strong></td>
<td><strong>40.5</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Solution**

There is great potential for the Medicare Local to play a pivotal role in community health promotion, provision of allied health services and support for GPs in chronic disease care by facilitating the Allied Health services required to manage the growing burden of chronic disease. This could be in addition to the programs already being managed/implemented by the ML (see P5 for more details). In addition, other solutions that could be looked into include:

- Explore shared facility / space options for chronic disease care and education with Mulungu and Tablelands Regional Council (see workforce and training).
- Explore funding through Government Initiatives eg Closing the Gap, Indigenous Chronic Disease Package – funding to support prevention, improve identification, and management of chronic disease among Indigenous Australians, including practice incentive payments, reducing the cost of medicines and establish a workforce to tackle tobacco use and obesity.
- Better integration of chronic disease registers.
- Look at mobile models and how they work elsewhere.
Workforce and recruitment implication

A Student learning multi-disciplinary Chronic Disease Clinic (CDC)

A teaching multi-disciplinary CDC would offer the opportunity for students from multiple health disciplines to learn and work together to manage chronic disease conditions in a team environment. The vision is for the creation of a clinical learning centre providing chronic disease management to low-income earners of Mareeba and surrounding districts who do not currently attend General Practices in the region.

There are educational and professional arguments for creating interdisciplinary learning experiences for students in the health professions. In 2003 in the USA the Committee on the Health Professions Education Summit, which was tasked with identifying ways to reform health professional education for the enhancement of quality of healthcare, made the point that “All health professionals should be educated to deliver patient-centred care as members of an interdisciplinary team, emphasising evidence-based practice, quality improvement approaches, and informatics.”

The proposal is to expand the chronic disease clinic using the services of health professional students in the latter stages of training (nursing, medical, physiotherapy, occupational therapy, pharmacy and physicians assistant), with the dual goals of expanding services to patients and increasing access to interdisciplinary training for JCU health profession students.

Community nurses currently run the clinic. The learning centre model would place the community nurse in the position of supervisor for students who would have a profession specific preceptor providing supervision off-site. Students would work within set guidelines under direct supervision. The students would run a case conference for each patient and contribute to the discussion according to their role. Students participate in the clinic either on a once-off or recurrent basis, depending on the requirements and commitments of their curriculum/ placement schedule.

Table 14: Type of student and examples of proposed activity in the clinic

<table>
<thead>
<tr>
<th>Type of student</th>
<th>Examples of proposed activity in the clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td>Taking history and performing physical examinations, plans for identified health issues. Providing health education</td>
</tr>
<tr>
<td>Nursing</td>
<td>Making vital observations and taking blood, performing falls risk assessment, doing dressings etc.</td>
</tr>
<tr>
<td>Occupational therapy</td>
<td>Performing assessment of activities of daily living capacity</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Performing medication reviews and patient medication education</td>
</tr>
<tr>
<td>Physicians assistant</td>
<td>Eg. Performing Doppler USS of peripheral arterial supply</td>
</tr>
<tr>
<td></td>
<td>Eg. Performing spirometry/ peak flow assessment</td>
</tr>
<tr>
<td></td>
<td>doing ECGs, BSLs,</td>
</tr>
<tr>
<td>Physiotherapy/Exercise physiology</td>
<td>Assessing exercise capacity and developing exercise plans</td>
</tr>
<tr>
<td>All students</td>
<td>Conducting group patient health education sessions</td>
</tr>
</tbody>
</table>

An action research process would be established to evaluate and develop the clinic to improve clinical effectiveness and the student experience.
Other training implications

Poor understanding of EPC Medicare items and their appropriate use, shortage of appropriately trained nurses to contribute to EPC plans and limited awareness of specific software for EPC plans have been identified as reasons for low use of EPC items\textsuperscript{23}. Interventions including skill development in software use, information on health outcomes and appropriate use of EPC items and promotion of the key role of practice nurses in the provision of EPC plans have been successful elsewhere in increasing use by 20 per cent\textsuperscript{23}.

Implementation plan

Arrangements have been made for the Clinical Director of Kardinia Health, Victoria to visit Mareeba and talk about a similar clinic where she is Medical Director in Barwon. Meetings have been scheduled with all local stakeholders including the local hospital directors, executive QH representatives from the HHS, the CEO and other pivotal staff from the ML, university representatives from Medicine, Nursing and Allied Health, local GP clinics and Mulungu (local ACCHS). These meetings will take place in August. The previous site and buildings occupied by Mulungu have been identified as a potential site, and fractions have been committed of QH medical and nursing staff to provide a supervisory workforce. Further workforce could possibly arise from an NP role funded by Medicare billings, and GP registrar rotating from private general practice. The Mareeba Hospital Medical Superintendent is taking the lead in implementing this initiative.

P2: Creating a clearly identified Primary Healthcare Home (PHC) for all residents and improving access to bulk-billed GP services

Issues

Anecdotal reports from healthcare providers indicate high dependence by some residents on Mareeba Hospital Emergency Department as their main source of primary care. The low income, non-Indigenous population and Indigenous patients who prefer not to use the ACCHS, have been identified as potentially high users of hospital services. There is also reliance on hospital services for ‘same day’ or acute primary medical care across the community, although this is difficult to quantify.

Confounding this issue is the utilisation by Mareeba Hospital of the COAG 19\textsuperscript{2} exemption to the Health Insurance Act, allowing bulk billing of non-admitted and non-referred patient services. This has short term benefits of relieving workforce shortage by generating revenue for employment of additional medical, nursing and administrative staff. However, it can be seen as disincentive to the expansion of general practice within the community. It also acts as an incentive to encourage patients to attend for conditions that may be better managed in the primary care setting. The TRC Tablelands Community Plan 2021 identified the need for transparency in decision making in relation to the use of revenue generated through the exemption.

Supporting data

Mareeba is serviced by one ACCHS with 4 FTE medical practitioners and two private general practices (primarily fee for service) employing a total of 7.2 FTE medical practitioners. This relates to a GP population ratio of 54 FTE GPs / 100,000 population which is lower than National (103.1 FTE GPs/100,000) and Queensland figures (79.2 FTE / 100,000) reported for Outer Regional Areas (AIHW 2012, DHA 2008).

A study of Tablelands residents attending the neighbouring Atherton ED (for conditions triaged as cat 4 or 5) found that only 63.4 per cent (n=151) had a local GP. The most common reasons for not having a GP included: recently moved to the area; not needing a regular GP; not being able to afford to visit the GP and not being able to find one accepting new patients.
Table 15: ACCHS and Private GP Coverage of Mareeba Residents

<table>
<thead>
<tr>
<th>Practice</th>
<th>Active Patients</th>
<th>% Mareeba SLA</th>
<th>Mareeba Adjusted Patients</th>
<th>% Indigenous</th>
<th>Adjusted Indigenous Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCHS</td>
<td>2170</td>
<td>91.8%</td>
<td>1992</td>
<td>89.6%</td>
<td>1785</td>
</tr>
<tr>
<td>GP 1</td>
<td>13376</td>
<td>98.8%</td>
<td>13215</td>
<td>0.1%</td>
<td>13</td>
</tr>
<tr>
<td>GP 2</td>
<td>3590</td>
<td>96.1%</td>
<td>3450</td>
<td>0.1%</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19136</strong></td>
<td><strong>18658</strong></td>
<td></td>
<td></td>
<td><strong>1802</strong></td>
</tr>
<tr>
<td>% Mareeba Residents 1</td>
<td>95.6%</td>
<td>93.2%</td>
<td></td>
<td></td>
<td>67.3%</td>
</tr>
</tbody>
</table>

1 Mareeba SLA population 20,020 and Indigenous residents 2,677 (ABS Census 2011)

In 2011-12, the proportion of patients triaged as category 4 or 5 and subsequently discharged accounted for approximately 72 per cent of all ED activity at Mareeba Hospital. In comparison, the proportion in the neighbouring town of Atherton is 67 per cent and for Queensland 45.7 per cent (AIHW 2012). This may reflect lack of access to general practice in Mareeba and historical use of hospital services for primary care.

Table 16: Comparison Average Monthly ED Activity Mareeba and Atherton Hospitals

<table>
<thead>
<tr>
<th>GP FTE/100,000 Population</th>
<th>Discharged Triage 4 and 5 n and (% of Total ED Activity*) 2010-2011</th>
<th>Discharged Triage 4 and 5 n and (% of Total ED Activity*) 2011-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mareeba Hospital</td>
<td>54</td>
<td>1578 (78.6%)</td>
</tr>
<tr>
<td>Atherton Hospital</td>
<td>76</td>
<td>1040 (67.8%)</td>
</tr>
</tbody>
</table>

*All other ED Activity includes: admitted/transferred triage 1-5, dead on arrival, did not wait, died, discharged triage 1-3.

Data from other states suggests an association between ED use, reduced GP accessibility and financial issues (McGaw et al 2006). However studies have shown that increasing bulk-billing services does not necessarily result in decreased ED attendance (Hanson 2004). This indicates a complex relationship between supply and demand (Knox 2004). Added to this is a significant cultural history in Queensland with respect to the use of public hospitals as an alternative to general practice (Veitch, Wallace, Doolan, 1999).

The concept of a primary healthcare or medical “home” was first described in the 1960’s in relation to care for children with chronic disease (Veitch 1962). Recent discussions of the medical home focus on ensuring access to comprehensive, integrated care for patients with a focus on: access, patient-centred, management of patient information, and continuity (Veitch 1999). Sustained continuity of care is associated with patient satisfaction, decreased hospitalisation and ED visits for chronic conditions and improved provision of preventive services (Knox 2004). A survey in seven countries found that between 45 per cent - 61 per cent (Australia 59 per cent) of adults report having a medical home and within each country those with a medical home reported better communication with their providers and easier access to care (Veitch 1999).
Solution

The best solution is that all residents have a clearly defined primary healthcare “home” and affordable access to quality primary healthcare. To achieve this multiple strategies could be implemented:

1. Revenue generated from the COAG 19 exemption should be targeted at community need and ensure sustainability of existing and new general practices.

2. Expansion of current chronic disease clinic to Primary Care Clinic targeting residents without a regular GP. This could potentially have similar continuity benefits as private general practice for those otherwise not accessing such services. This could be considered if other options to improve access to private general practice are not successful, but would require monitoring to ensure does not undermine sustainability of existing practices.

3. Trial bulk-billed GP clinic run by private GPs and ACCHS at shared and existing facility.

4. Voucher system to improve access to general practice services amongst low income earners and those with complex problems. Patients could potentially be identified by the hospital. Need to consider GPs ability (including physical space and workforce) to take on more patients. Possibly coordinated through Medicare Local rather than through Queensland Health.

5. Trialling of voluntary registration of patients with general practices is currently being considered by the federal government as part of the Primary Health Care reforms (Powell Davies, Perkins, McDonald, Williams 2009). The RACGP is advocating for voluntary patient registration to formalise and strengthen the relationship between patients and GPs and to underpin a possible model for funding GP care outside the consult (AMA 25.2.13 online).

6. Continuation of GP practices calling hospital to inform of any free appointments.

P3: Making sure patient records across primary and secondary care are compatible

Issues

Lack of integrated health systems between health service providers mean that patient information cannot be shared between the private GP clinics, ACCHS and Queensland Health. This inhibits continuity of care and can also have safety implications in terms of medication changes and investigation results.

Solution

The Patient Controlled Electronic Health Record (PCEHR) allows patients and doctors, hospitals and other healthcare providers to view and share health information.

Apunipima Cape York Health Council have been trialling the system with great success in the Cape and patients really like the idea and are empowered by it. Very few patients have tried to hide their information (which has been raised as a concern by some clinicians) and in any case doctors in an ED would have a “break glass” option to enable access to hidden information if required.

Registration for the system is quite tricky and the project is looking into funding options from the Commonwealth to help patients in the community register. Medicare Local are also helping to implement the PCEHR and are also doing some work around the Integrated eHealth Program. Elsewhere Medicare Locals are playing a lead role in assisting community members (and practitioners) with the signing up process.
P4: Cancer care coordinator and utilisation of tele-oncology

Issues

The cancer patient’s journey may involve many health professionals in different treatment facilities in distant locations. In Mareeba, this may mean a schedule of multiple appointments in Cairns (an hours’ drive away) or perhaps Atherton (20 minutes by car) and there is no system to co-ordinate these appointments. Many patients may not have access to their own transport and the public transport service is irregular and infrequent. The Tablelands Regional Council does what it can to help those in need of transport without family support but underline that this is a major issue for them in service provision. Projected population ageing and relatively high rates of smoking and other risk factors for cancer indicate that this will be a growing problem for the community over time.

Solution

Patients and carers need an experienced clinician to coordinate their care, to help them navigate health services, and to provide a single point of contact for information and support. In addition, GPs need a single point of reference to coordinate a newly diagnosed cancer patients’ care, with attention to streamlining the patient journey and any resulting distress.

The role of the cancer care coordinator to help fulfil this need. An example of where this model has been implemented is the Cancer Institute NSW (Cancer Institute) which has provided temporary demonstration funding for cancer care coordinator positions in Area Health Services (AHS) in NSW since 2004–2005. They were funded as cancer nurse coordinators, but are referred to as cancer care coordinators.

The cancer care coordinator’s key roles and responsibilities are to:

- Foster an area-wide approach to optimising cancer care.
- Provide patient-centred care.
- Coordinate patient care and provide access to appropriate services.
- Support multidisciplinary care.
- Demonstrate a commitment to continuing professional development.
- Act as an information and education resource.

The cancer care coordinator positions vary according to the area in which they are employed, the tumour type (or types) of their patients, and the complexity of their patients’ care needs. Rural cancer care coordinators may be community-based and tend not to be restricted to disease or treatment silos.

The cancer care coordinator positions have been evaluated and shown to improve the quality and capacity of cancer services in NSW. In particular, the evaluation found that the cancer care coordinator role has had a strong positive impact on three key areas:

- Providing patient-centred care.
- Improving care coordination.
- Supporting multidisciplinary care.
Workforce, training and recruitment implications

The same role could easily be implemented in Mareeba and the Cancer Council Queensland could be approached to fund a pilot as the Cancer Institute NSW has done.

Tele-oncology

A large funding proposal to the Hospital Innovation Fund (HIF) to develop tele-oncology in the CHHHS has been approved in tandem with Townsville HHS. This will be rolled out over the coming year and more details will be available shortly. This will help solve the problem of co-ordinating multiple visits and transport to Cairns for patients with cancer.

Major benefits for patients include less travel for patients, complex services are available locally, including chemotherapy delivery, less disturbance to family life, convenience, saves money for system and patients, patients appreciate it and expect it and community cannot afford not to embrace this technology. There are also benefits for doctors, nurses and allied health workers in the form of continuing education, ready support by specialists and access to a medical oncologist in their own setting. A pilot trial of delivering tele oncology to Mount Isa from Townsville Hospital has shown that patients and health workers approve of this model of care due to its many benefits to rural and remote patients. Videoconferencing allows oncology patients to be cared for closer to home without costly long distance travel.

P5: Filling gaps in allied health

Issues

There is a shortage of allied health services in rural Australia and Mareeba is no exception. Since the inception of the FNQ ML at the beginning of 2012/13 financial year the ML has been very active in trying to fill these gaps, although the service is still at an early stage of development. Limited services currently available include:

- A psychologist visit one afternoon per week and podiatrist once a month.
- At Mulungu, a podiatrist, psychologist, diabetes educator and dietitian all come approximately once a month. Mostly for Mulungu patients but sometimes they also see patients from general community. There is no physiotherapist currently but there used to be.
Solution

1. Medicare Local filling known gaps

There are three allied health programs that the ML are currently delivering on behalf of the Commonwealth government, however ATAPS is still at the conception stage of how to deliver this program to the community. Consultation feedback also suggested that the ML could look into bulkbilling allied health services and pursue co-locating allied health services as this may be more socially acceptable. For example, community members preferred visiting a psychologist within the general practice facility. Discussions have also been held about the possibility of locating ML brokered allied health services on ACCHS premises.

i. The Access to Allied Psychological Services (ATAPS)

This initiative is an Australian Government program which provides access to effective, low cost treatment for people with a mental illness who may not otherwise be able to access services. ATAPS funds the provision of short term mental health services for people with mental disorders through fund-holding arrangements administered by Divisions of General Practice (Divisions) and established Medicare Locals. The fund-holding arrangements will transition to other Medicare Locals as they are established and as they demonstrate capacity to provide mental health services.

ATAPS is a component of the Better Outcomes in Mental Healthcare (BOiMHC) Program which was introduced in July 2001. The objectives of ATAPS are to:

- Produce better outcomes for individuals with common mental disorders through offering evidence based short-term psychological interventions within a primary care setting.
- Target services to those individuals requiring primary mental healthcare who are not likely to be able to have their needs met through Medicare subsidised mental health services
- Complement other fee-for-service programs and address service gaps for people in particular geographical areas and population groups:
  - offer referral pathways for General Practitioners (GPs) to support their role in primary mental healthcare;
  - offer non-pharmacological approaches to the management of common mental disorders; and
  - promote a team approach to the management of mental disorders.

ATAPS is a targeted program designed to increase the capacity of Divisions and Medicare Locals to give priority to hard to reach groups who continue to miss out on Medicare subsidised services under Better Access. These include: people who are less able to pay fees; culturally and linguistically diverse communities; people who are homeless or at risk of homelessness and people in rural and remote locations.

ii. Aged Care Access Initiative

HGGW-Activity-2A needs assessment is underway to engage with stakeholders in the aged care area. This assessment will identify aged care needs, map out service delivery and highlight the gaps in services.

This involves consultation with patients, carers, residential aged care facilities, local general practitioners and allied health professionals regarding health service needs for residential aged care facility residents.

Alternative workforce models of care using professionals such as nurse practitioners and aged care specialists also are being investigated.

While this is underway, allied health services including group programs, general practice, dental hygiene, podiatry, physiotherapy, dietitian, occupational therapy and speech pathology will be provided for individuals or groups of residential aged care facility residents.
The Rural Primary Health Services program gives community-based allied healthcare services greater flexibility in the range of services they can offer, including health promotion and preventative health activities.

iii. Rural Primary Healthcare Service

The Rural Primary Health Services (RPHS) program aims to improve access to a range of primary and allied healthcare services and activities for rural and remote communities. The RPHS program gives community-based primary healthcare services greater flexibility in the range of services they can offer, including health promotion and preventative health activities.

Primary healthcare services encompass active treatment, screening programs, health education on individual health risks, and more broadly, efforts to address health concerns for the entire community through preventative health activities.

Service providers are expected to undertake regular community needs assessments and evaluate their performance to deliver primary healthcare in a way that best meets the identified needs of rural communities. Service delivery models that they use must be responsive to community needs, use the available workforce, and are practical, acknowledging the individual characteristics e.g. geography, demography, isolation, etc. of their community. The service must also take into account the aim and objectives of the RPHS program.

The FNQ Medicare Local provides the following allied health services to general practices through a referral process to eligible communities including Innisfail, Tully, Tableland, Yarrabah, Mossman, Port Douglas and Cooktown:

- Diabetes Education.
- Physiotherapy.
- Podiatry.
- Psychology.
- Dietician.

2. Development of allied health assistant roles and skilling-up existing health professionals

Another solution for dealing with specific shortages in allied health workforce includes the skilling up of existing health workers (including Aboriginal Health Workers and community nurses) with the competencies to provide some allied health services (under the supervision of visiting allied health specialists). Competencies with the most obvious and immediate shortages include nutrition/dietetics and foot/lower limb care, as well as eye care. Precedents exist for training Aboriginal and Torres Strait Islander Health Workers in these skills within the ACCHS sector, and evidence reveals high quality acceptable service provision under these arrangements.
P6: Travel to Atherton for Dialysis/Lotus Glen inmates to Mossman

**Issues**

Haemodialysis services are currently located at Atherton Hospital (30km from Mareeba) which has eight chairs. At the time of study 6 out of 15 patients accessing haemodialysis at Atherton Hospital were from Mareeba or towns to the west of Mareeba. Four of these patients are Aboriginal and or Torres Strait islander. There are a few patients (at least 1) on home based dialysis managed through Cairns and supported from Mareeba. There are also 5 Indigenous patients within the nearby Lotus Glenn correctional facility requiring dialysis who also need to be accompanied by security guards travelling to Mossman three times each per week for dialysis treatment. This is extremely costly for the facility and the health service, not to mention disruptive for the patients involved.

**Supporting data**

The national prevalence of end stage kidney disease for 2001 and 2008 have been used to estimate prevalence projections for Mareeba 2011 and 2021. The estimate is adjusted for change in overall prevalence over time but unadjusted for age. This resulted in a prevalence of 0.14 per cent (n=29) in 2011 and 0.18 per cent (n=43) in 2021.

Figure 14: Projected Number of Persons with ESKD: Mareeba 2011 and 2021

![Chart showing projected number of persons with ESKD in Mareeba 2011 and 2021](image)

National guidelines recommend that dialysis should be provided as close to home as possible (Australian Department of Health and Ageing, 2011). Satellite dialysis centres provide local dialysis treatment for patients near their place of residence with minimal staff supervision whilst comprehensive renal services (including medical care, education, training, home visits for community based patients) are coordinated by a renal unit located in a major or regional centre. Satellite services are accessed by patients with the assistance of a carer or “buddy”, or nurse who has undergone training. Mobile or transportable dialysis facilities have also been utilised or considered to improve access in areas where there is minimal infrastructure and in very remote or island communities. However there is limited evidence regarding the costs associated with this option.
Solution

Establishing a Mareeba satellite dialysis service under a public-private partnership with support from Atherton Hospital is one solution that could improve patient care, reduce transport and ongoing costs. Dialysis chairs could be located at either Mulungu or Lotus Glen Correctional Centre.

Workforce and recruitment implication

Training and paid employment for “buddies” can improve the sustainability of community-based haemodialysis because of the high level of commitment and expectation on the buddy (Kneipp et al, 2004). There is also the possibility of tapping into existing nursing workforce with dialysis experience.

Training implications

A national survey of the learning needs of nurses working in satellite dialysis found: they wanted support in form of regular study days, local access to dialysis expertise, short courses in dialysis care in satellites and a specific liaison person at the parent unit. Partnerships need to be developed between parent units, satellite nurses and tertiary institutions to pioneer innovative curricula to meet the local needs of nurses (Wellard S, Bethune E. 2000).

Telemedicine has been used for rural dialysis patients in Australia, Norway and USA to reduce the need for patient travel and to provide educational events and administrative support31.

CHHHS home dialysis training centre – training patients to do their own haemodialysis – 12 week course. This could be expanded to include family members/buddies or Aboriginal Health Workers with additional skills in

The University potentially has a role in provision of training for dialysis nurses.

Implementation plan

Locating dialysis treatment locally is currently under consideration by the HHS and a private provider of dialysis chairs and equipment (Fresenious Medical Care Australia Pty Ltd. (Queensland) has been approached to provide a quote. The cost of dialysis provision elsewhere of $70 per treatment suggests a substantial cost-saving for QH under this model, as well as substantial benefits for the individuals concerned. The university (JCU) is assisting the HHS in developing a training plan to enable a renal dialysis and aboriginal health worker combined team to administer the treatment. This could be similar to the courses provided by Notre Dame University at the Broome campus in Western Australia.
Reinforcing and expanding secondary care in Mareeba

S1: Continue to strengthen generalist model

Issues

There is a growing demand for admissions and inpatient and procedural healthcare on the Tablelands. Mareeba Hospital has attempted to do some costing on transfers to Cairns however it requires a complex model to account for the acuity of patients and skills of referring doctor. During 2012, approximately 10 patients per week were transferred to Cairns Emergency Department.

In order to maintain credentialing for rural generalists a full case load needs to be maintained especially in regard to GP obstetrician skills.

Solution

Mareeba Hospital needs to continue to strengthen generalist model. This requires discussions with specialists in Cairns about ability/opportunities to operate within credentialing scope. Mareeba rural generalists all have advanced skills training in Emergency Medicine, Obstetrics and Anaesthetics. Mareeba doctors could also work in Cairns on rotation to fill trainee registrar positions and maintain skills. Better coordination of registrars could also help develop skills.

Workforce and recruitment implications

Mareeba hospital currently has a strong team of rural generalist doctors with specific skills in anaesthetics, obstetrics and emergency medicine. Recruiting rural generalists to Mareeba has improved probably due to the success of the Queensland Health Rural Generalist Pathway and the development of the JCU rural medical program, mirrored by the expansion of Mareeba as a training hub. This program has addressed the lack of career paths for Queensland rural hospitals and rural medical careers and minimises the amounts of moving locations that trainees and their families have to make.

Of the five advanced skills identified (Emergency medicine, OandG, Anaesthetics, Surgery and Paediatrics); OandG and Anaesthetics are best represented in Mareeba. Development of rural surgical skills has been identified as the next priority. Continuing the strengthening and development of Mareeba as an excellent training hub for medical students and junior doctors is essential for succession planning and maintenance of a strong workforce into the future.

Implementation plan

The medical superintendent of Mareeba Hospital is advertising for a rural generalist with advanced surgical skills (see T3 for more information).
S2: Develop comprehensive recruitment and retention plan for nursing workforce

Issues

In order to support the rural generalist medical officers strengthening the services provided locally in Mareeba the hospital nursing workforce also needs to be developed. In particular, generalist and surgical (extended practice) nurses are in short supply. Sustainability for the nursing workforce also has to be ensured by providing quality training, physical space and resources.

Despite the relatively strong medical workforce, strengthening the nursing workforce is a high priority here. Suggestions from the Clinical reference group focused on developing a 2 year rural nurse internship similar to programmes delivered in the U.S and Canada. The benefits of having nurses that have a wide array of skills (generalists) and who are able to be flexible is another priority for managers of nurses in a regional hospital. It was also suggested that separating nursing and midwifery may not be practical at this level hospital. The training of nurses in both midwifery and nursing, as happens in New Zealand was also suggested as an example of a more generalist approach. Provision of surgical training for nurses was another priority.

More specific local strategies to recruit nurses to the region with dedicated orientation and mentoring was also thought to be important, along with strategies to support families and encourage retention.

Solution

Rural Nurse Internships

The Rural Nurse Internship program is a distance education-based nurse residency designed to meet the needs of rural hospitals across the country. Nurses learn to perform the generalist role by practicing crisis assessment and management in six subnursing specialties. The collaborative year-long residency provides preceptors, mentors, monthly seminars, and just-in-time information to novice nurses in their own hospitals using instructional technologies. Expert rural nurses teach novice employees using a standardised curriculum. Hospitals individualise the program to meet employee and hospital needs. The program is a collaborative education program built on four underlying principles: (1) new employees learn best in their own facilities from expert rural nurses, (2) distance education technologies can bring instruction to the geographically bound, (3) just-in-time support improves practice and reduces errors, and (4) hospitals need control of employee education. Hospitals in towns with fewer than 50,000 residents select services from a menu to design a program based on the employee's job description. Interns are enrolled throughout the year to meet the needs of the individual. The hospital also supplies computer support, time to complete the education, and a preceptor. The university (Idaho State University) provides the curriculum, program administration, and mentors’ and preceptors’ training.

Hospitals enrol new graduates, returning-to-practice nurses, and those transferring from urban centers with less than a year of rural employment. Graduates receive up to 203 continuing education contact hours, a certificate, and a letter for their personnel file. Preceptors and mentors also earn continuing education credit.

Targeted recruitment programs for nursing (and allied health)

In Rural South Australia, a program ‘Work in Rural SA’ is underway (funded through HWA).

There are two options for allied health and nursing – a two year placement in a rural practice or health service, or a permanent relocation to a rural town.
Features of the recruitment drive include:

- Bringing the nurse and partner for a visit prior to making that final decision.
- Granting independent financial and legal advice before signing the contract.
- Assisting with all registration and visa requirements.
- Assisting with relocation expenses for nurse and family.
- Provision of a minimum of two-weeks fully funded orientation program prior to commencing work.
- Provision of an orientation and assistance to family to help them settle.
- Assisting partner in finding employment.
- Invitations to weekend events to make sure of transition into the Australian system.
- Connection with other health professionals for peer support and guidance.

Implementation plan

The Director of Nursing at Mareeba hospital will work with on-going workforce planning project team (in particular the School of Nursing) to move suggested solutions ahead.

S3: New public/private partnerships to be explored for funding incentives to attract clinical staff

Issues

It has over recent years proved impossible to attract a much-needed sonographer to work at Mareeba hospital. This has led to the resident radiographer billing extensive over-time and an impossible workload.

Solution

Recruit a sonographer through Health Workforce Queensland’s Rural Health Professionals program

The recruitment of a sonographer through Health Workforce Queensland is underway and due to workforce shortages in Australia this is likely to be an overseas trained candidate and so sponsorship through the Rural Health Professionals Program is being discussed.

The Rural Health Professionals Program (RHPP) aims to increase the allied health and nursing workforce in rural and remote Australia to improve the delivery of primary healthcare services in these locations.

This new Australian Government program is designed to attract, recruit and retain allied health and nursing professionals to work in rural and remote Australia. Health Workforce Queensland will be funded to undertake recruitment of and support for these professionals in Queensland.

Under the program employers can enjoy the benefits of Health Workforce Queensland’s experienced comprehensive recruitment service free of charge. Meanwhile successful recruits can expect to receive a comprehensive service to assist in their successful placement.

A limited number of individually tailored settlement and support packages, each lasting up to two years, are available to assist employees to remain in their positions and to assist employers in terms of staff retention.
Integrating Physicians Assistants (PAs) into the hospital

The role of PAs was also thought to be of interest to Mareeba hospital and JCU will pass on this information to the JCU PA course co-ordinators as a placement might be able to be arranged. The first cohort of PAs from JCU are due to graduate at the end of 2013.

The Physician Assistant (PA) profession is hugely popular in the United States with over 80,000 PAs in practice. The Physician Assistant concept has been adopted by many other countries including; Canada, UK, The Netherlands, and South Africa. The Bachelor of Health Science (Physician Assistant) course is offered through the School of Medicine, James Cook University (Townsville Campus) and provides individuals with previous healthcare experience the knowledge and skills necessary to deliver clinical medical services under the supervision of a doctor or physician.

The interdependent relationship between the Physician Assistant and their medical supervisor and the resulting delegated practice model is considered a defining feature of the profession, and distinguishes it from other healthcare roles. Physician’s Assistants are trained to perform many of the tasks previously done solely by medical practitioners, including history taking, physical examination, diagnosis, and treatment. This course particularly focuses on educating healthcare professionals who will provide medical services within a team based practice model in rural and remote locations in Australia.

Designed specifically for individuals with previous healthcare experience, this course is offered using a variety of educational methods including a combination of coursework and clinical exposures.

The first two years of the course are delivered via distance education; however, students are required to attend a number of on-campus residential blocks at the Townsville campus throughout this time. The final year of this course is a full year of clinical placement (with limited residential blocks). The clinical year of the course can be undertaken either full time (1 year) or on a part time basis (over 2 years). Through this method of course delivery, it is possible for practitioners to continue in their current work setting while developing new skills.

In addition to topics in rural and remote medicine, the curriculum includes techniques in patient interviewing and record documentation; diagnostic skill development including physical examination, clinical investigation interpretation, and patient management. Topics in adult medicine, health promotion and disease prevention across the age spectrum will also be addressed. Learning to access evidence based medical information and incorporate it as a clinical tool will be a recurrent theme throughout the course.
S4: Develop and introduce new roles targeted at high demand e.g. Nurse Endoscopists

Issues

Currently, there is no regular physician service available at Mareeba Hospital and very limited visiting specialists. The National Bowel Cancer Screening Program (NBCSP) roll-out – where up to 4.8 million people will be eligible for screening now until the end of 2015 has generated an enormous need for endoscopies for follow-up of positive screening tests. There are considerable waiting lists in rural areas if patients need to travel to Cairns for endoscopies.

Solution

For example, implementation of nurse endoscopist role supported by local generalists and CBH gastroenterologists.

The role of a nurse endoscopist was welcomed by the Mareeba Hospital CRG but it was also noted that there was very little support from this from local gastroenterologists. The pilot programme at Logan hospital however proves that this is already being adopted in Qld and will be pursued as an option in the near future. There is currently an HWA program currently in its early stages in Austin Health, Southern Health, Alfred Health and Western Health in Victoria and Logan Hospital in Queensland where nurses are trained to deliver endoscopy services.

Under the model, nurses will develop and enhance their scope of practice to safely undertake endoscopic procedures on patients.

Nurse endoscopists have been working in the UK and US since the 1990s. Advance practice nurse endoscopists will also help address other key issues highlighted in the Health Workforce 2025 report by:

• Working in conjunction with gastroenterologists in communities that have trouble attracting enough specialists to perform these services.
• Providing an attractive career option for nurses who may be considering leaving the profession due to their skills being wasted.
• Delivering safe, quality services at less cost, while freeing up doctors to work on more complex cases.

The project aims to implement a model suitable for national roll out, establish a national training program for nurse endoscopists and devise toolkits and implementation guides for the nurse endoscopist model.

Workforce and training implications

If the Logan initiative proves successful it is likely that QH will roll this out to other sites throughout Queensland. This will require the services of a local gastroenterologist to supervise the nurse through training. It is also provides an attractive career path for nurses wishing to upskill.
Issues

Pathology is couriered twice a day and as needed after hours and at weekends to QH Cairns. Executive had been told previously that public/private partnership not possible. Mareeba has prepared a business case. The process is easy, it should be achievable as no current local service and 19.2 exemption improves sustainability.

The State Government is currently looking at private / public arrangements for providing pathology services and report is six months away. It still needs to be sustainable in a business sense and outcome would involve shared service with Atherton.

Need onsite blood (donor facilities) for emergencies.

Solution

Public-private partnerships

It was noted the Pathology Qld have no incentive to provide a better service to Mareeba and so private pathology companies should be approached. Sullivan Nicolaides is already present in Mareeba and could well be interested in providing a service to the hospital.
Reducing demand on tertiary services in Cairns

T1: Increase local mental health capacity through employment of skilled mental health nurses to minimise transfers

Issues

There are gaps in after-hours emergency mental healthcare (current service only 9am-3pm) however there is a need to expand mental health nurse service during the day as well as after hours. There is a need for a comprehensive mental health service which would reduce the need for crisis intervention. Due to a lack of resources (including staff) priority is to make sure people get their medication but there is no case management and continuum of care. With a primary healthcare centre/model you could have extended hours mental healthcare.

Supporting data

Cairns Emergency Department data show an increase in mental health transfers from Mareeba in late afternoon.

Solution

Mental health community nurses will now be present at triage to increase capacity to treat MH patients locally before the 3pm end of MH service. It is suggested that the ML could provide a MH nurse from 3pm to 11pm for example in the ED to lengthen locally provided MH services.

The use of telehealth and Cairns based psychologists is a priority. A meeting with the Clinical Director of MH at Cairns Hospital is being scheduled to discuss telehealth solutions to the community from Cairns-based psychologists and Mental Health Nurses.

Workforce implications

Recruitment of additional mental-health trained nurses or up-skilling local nurses. Training of Cairns-based psychologists to incorporate delivering telehealth clinical advice to the community into their current scope of practice.

T2: Increased range of services provided through Mareeba hospital

Issues

A specialist role is to help maintain quality, training and skills locally available to the community. Currently specialist visits to Mareeba from Cairns are determined by staffing level at tertiary level (Cairns Base) hospital; and consequently staff often cancel their visits at short notice. This results in appointments continually being cancelled causing inconvenience for both local staff (having to remake the appointments) and patients wasting their time in coming to the hospital and then being told to come back at another time.

A visiting ophthalmologist is also required

Solution

A business case needs to be created for the CHHHS which takes into account the cost of transfers as well as activity-based funding for the procedure (both borne by the service and the council). It’s more cost efficient for a specialist to come up to Mareeba and see multiple patients rather than sending them all to Cairns. This would also be more patient centred and family friendly. Specialists could also run clinics at the new super clinic at Mulungu which has new consulting rooms precisely designed for this. This would increase their lists and efficacy of spending a day away from the tertiary facility. Visiting services to outreach areas – Mt Garnet, Herberton, Dimbulah, Chillagoe could also be better co-ordinated and prevent unnecessary trips to Cairns.
**Workforce Implications**

More Cairns based specialists providing outreach services in a well-coordinated manner. Consider establishing a rotation for physician trainees in Mareeba with remote supervision, using Specialist Training Post scheme.

Well-coordinated and supported telehealth services for consultations and support between outreach visits (with both hospital staff and private providers). This will require both teleconference coordination and training/IT support (provided in partnership between QH and FNG ML).

**T3: Expanded local surgical roster**

**Issues**

In the past GP referrals have often been made directly to the Cairns surgeons and not to the Mareeba Hospital. This has led to fragmented care for local residents when they have multiple points of contacts within the healthcare system. As the awareness of local more specialised skills increases at Mareeba Hospitals o does GP communicating with their local hospital.

**Solution**

*Creating a local surgical roster*

A local surgical roster list would prevent many patients from Mareeba still having to go to Cairns for relatively simple procedures (it was mentioned that this figure was approximately 300 on the waiting list at present). The Med Super and Executive Director of Medical Services agreed that surgeons in Cairns needed to be made aware of this and assist Mareeba hospital in extending the surgical services available. This would best be done in partnership with the Atherton hospital and surgical skills built at each centre for different procedures. There are also many unnecessary reviews being performed in Cairns which could easily be done in the Tablelands if surgeons in Cairns can be persuaded to collaborate with the tablelands hospitals. This is work in progress.

**Workforce Implications**

Ideally recruitment of a rural generalist with advanced surgical skills would facilitate the local surgical roster and use existing skills. Expanding the workforce of theatre nurses is also necessary to progress this solution.

**T4: Creating a fracture clinic with the telehealth support of Cairns Surgeons**

**Issues**

There are many patients that need to go to fracture clinic. At the beginning of this project, local patients were taken to Atherton or Cairns but that causes longer waiting times for patients and extra workloads for those hospitals. Support from orthopaedic registrars at Cairns is required to try to look after their fractures here otherwise the patients get transferred and cannot be followed up locally.

**Solution**

*Setting up a Fracture clinic at Mareeba Hospital*

The fracture clinic is now up and running and so far a great success. Capacity is being built gradually and resources are still scarce as doctors are still serving the large primary healthcare element in the ED however moving in the right direction.
T5: Provide pre-operative or follow-up care through share care model at Mareeba

Issues

Patients are not referred back to Mareeba when they could be treated and cared for locally. This results in unnecessary trips up and down the range for Mareeba residents, with consequent costs, family disruption and loss of productivity. It is also important for local staff to retain their patients in order for staff to keep skills up. A commitment to streamlining CBH visits needs to come from department heads in Cairns – medicine, surgery, anaesthetics.

When patients are transferred from Mareeba Hospital to Cairns Base Hospital they are sent via the ED which means they are “triaged” twice, this is a waste of health resources and extremely inconvenient for the patients.

Mareeba Information and Support Centre have received funding for a bus for transporting people to medical appointments but they have no funding for a bus driver.

Solution

Pre-operative share care arrangements – Anaesthetic checks could be done in Mareeba, with tele-transmission of ECG and other important investigations to anaesthetists in Cairns. This requires an allocation of space at Mareeba.

Better coordination of specialist appointments for Mareeba residents seeing multiple specialists is needed. Cairns specialists need to do their best to accommodate Tablelands patients for multiple appointments on same day. This will allow implementation of efficient transport options for Tablelands clients.

The private company Transit Care are interested in medical appointment transport / online software for bookings.

Providing pre-op and follow up through share care will need a funding arrangement whereby funds for usual postoperative care are transferred to Mareeba. This will generate overall cost savings for health service.

Mulungu has a “hands up” approach to transporting patients to medical appointments in Cairns by charging $20 for return trip. They supported 5500 patient trips to Cairns Jan-Dec 2012, this service could be expanded in partnership with the Mareeba Information and Support Centre by pooling resources.

Workforce Implications

Training needs to be given to hospital administrative and their counterparts at other local health services to use electronic booking software for health-related transport bookings.
Appendix B Yarrabah Solutions

Primary care related solutions

P1) Using integrated diabetes care plans (on-line accessed by all service stakeholders) for PHC oriented diabetes care.

Issues

There is a need for expanded and systematised management of chronic disease to keep up with growing demand.

Indigenous Australians are 3 times more likely to have type 2 diabetes compared to non-Indigenous Australians. This number of people with diabetes is even higher for those Indigenous Australians living in remote areas. Indigenous Australians are also at greater risk of complications than non-Indigenous Australians, with a 10-fold higher risk of kidney failure and up to 8-fold higher risk of high blood pressure\(^6\).

The latest data held by Gurriny Yealamucka Health Service (June 2013) show that over 280 patients are currently diagnosed with diabetes. Projections based upon calculations and projected rate of increase used in The Australian Diabetes, Obesity and Lifestyle Study, 2008 and ABS demographic data show that this could rise to almost 800 patients in 2026 (see chart below).

Figure 15: Projecting Prevalence of Diabetes in Yarrabah
Solutions

Systemising the use of integrated diabetes care plans (on-line accessed by all service stakeholders) for Primary Healthcare oriented diabetes care (eg. Chronic Disease Management Network - cdmNet).

Increase capacity for a regular coordinated adult health check. This could be implemented through a mixture of permanent and temporary staff employed for a short period to undertake a comprehensive adult health check of all eligible patients.

Telehealth specialist advice from Cairns diabetes centre is already available however needs formal training sessions to be fully operational.

Create a Nurse Practitioner or Practice Nurse role to manage diabetes care plans. This position will provide clinical expertise in the Chronic Disease Team that assists in the prevention, early detection and management of chronic health problems. The role would require strong collaboration with allied health services and other community, government and non-government agencies as part of a multi-disciplinary team. The position would contribute to clinical resource management, education and research accountabilities of nursing within the unit, and ensuring the provision of best practice and quality client care. The position will work in a highly complex environment requiring strong collaborative, negotiating and interpersonal skills. Increased use of EPC item numbers can generate more Medicare billings for the health service.

Improved utilisation of “Close the Gap” program through the Medicare Local for provision of ancillary allied health services.

Workforce Implications

Employing an additional GP registrar would not only increase capacity of the medical staff and ability to perform adult health checks but is also beneficial to the sustainability of the medical workforce. If this GP Registrar also had an academic post, they could be engaged in evaluating the success of various chronic disease programs at Yarrabah.

Employment of a Nurse Practitioner to assist in performing chronic disease management plans. This position could be funded through increased and more systematised use of EPC GP Management Plan and Team Care Arrangements item numbers. An NP employed in the chronic disease team with the existing chronic disease coordinator (Blake Fagan) could also play an important training role for Aboriginal and Torres Strait Islander Health Workers.

Training Aboriginal and Torres Strait Islander Health Workers with skills in eye and foot checks (to compensate for lack of Allied Health staff available to perform podiatrist and ophthalmic care) would help in keeping up with referrals generated through the expanded programme of adult health checks. Nutrition skills are also in short-supply, and Aboriginal and Torres Strait Islander Health Workers could have additional training in these.

Role for Medicare Local in filling known gaps, especially Allied Health

Regular training sessions need to be scheduled for Aboriginal Health Workers in the utilisation of telehealth equipment. This would enable the primary healthcare service to take full advantage of the diabetes centre telehealth services available from Cairns. This training needs to be ongoing to promote the sustainability of skills to new Aboriginal and Torres Strait Islander Health Workers as they are recruited.
Implementation

The Nurse Practitioner role is currently being recruited and will commence in September.

Telehealth training sessions are underway.

P2) Lack of integrated child and youth health programs

Issues

The community lacks integrated child and youth health programs linking the health service providers with the community and local schools in order to deliver these programs in partnership.

Medicare billing potential is also under-optimised and could be used to generate more income and fund the require health workforce required.

Solution

Aboriginal Health Worker roles could be located in schools to build up the links with the community and most importantly engage with children and their families to identify potential health problems early on.

Community empowerment and health promotion programs are essential in trying to prevent the onset of chronic disease. Particular focus in this community needs to be on young adults (15-24) as pre-chronic disease indicators measured through a comprehensive program of young adult health checks has shown that by the age of 24, over 50 per cent of young adults have pre-chronic disease conditions. Suggestions in the clinical reference group discussions focused upon preventative healthy lifestyle programs such as a “Yarabah Makeover” which would invite young adults to the community health centre to follow a fun education program including advice on diet, exercise and how unhealthy lifestyle habits impact upon health.

Workforce Implications

The position of a Nurse Practitioner would help the Medical Officers to undertake much of the work associated with Aboriginal child and youth health checks. They would also be able to generate income through Medicare bulk-billing.

Additional Aboriginal health Worker positions need to be located in schools and Education Queensland would need to be a part of creating that role. This role would also be able to liaise with the student psychology service that they currently provide.

The engagement or training of a current employee in Medicare billing knowledge in order to maximise revenue has also been suggested as health workers would be better utilised in delivering healthcare directly than trying to spend time on understanding billing regulations and guidelines.
P3) Recruit, train and support Aboriginal and Torres Strait Islander Health Workers through possible establishment of a centre of training excellence for Aboriginal health workers

Issues

There are often staff shortages and issues with recruitment and retention of Aboriginal Health Workers.

There are no providers of Aboriginal and Torres Strait Islander Health Worker training in Certificates III and IV available in north Queensland due to the collapse of QATSIHWEIPAC at the end of 2012. This has impacted upon Aboriginal and Torres Strait Islander Health Workers already undertaking health worker training as they cannot complete their certificates nor are there any opportunities for new Aboriginal and Torres Strait Islander Health Workers to upskill.

Solutions

The creation of a “Centre of Training Excellence” for Aboriginal and Torres Strait Islander Health Workers in Yarrabah would create a much stronger culture to recruit, train and support Aboriginal and Torres Strait Islander Health Workers.

This would link in with JCU /FNQ partnership centre for up-skilling of Aboriginal and Torres Strait Islander Health Workers towards national registration. The cohort training could be provided at Yarrabah and provide career pathways and support for Aboriginal and Torres Strait Islander Health Workers.

The recruitment of a nurse educator (employed by JCU) in Yarrabah who would provide support and education for current and potential Aboriginal and Torres Strait Islander Health Workers and training for rotating nursing

Implementation:

JCU has led a consortium that has successfully applied to HWA to provide Certificates III and IV training to Aboriginal and Torres Strait Islander Health Workers in north Queensland with a view to supporting Aboriginal and Torres Strait Islander Health Workers towards AHPRA registration. This project is being rolled out initially over the next 2 years.

JCU is a top ranking tertiary institution governed by the James Cook University Act 1997. The Faculty of Medicine, Health and Molecular Sciences at JCU has a long history in workforce development that meets the health needs of Indigenous Australians across Australia. While JCU is not a registered training organisation (RTO), JCU will lead a consortium of partners who collectively represent the university, vocational education, RTO and Aboriginal Community Controlled Health Service sectors.

The following organisations have indicated their agreement to join the consortium:

- Townsville Aboriginal and Torres Strait Islander Corporation for Health Services (TATSICHS)
- Apunipima Cape York Health Council
- Tropical North Queensland TAFE (TNQT), (an ASQA accredited RTO currently preparing an application to add Aboriginal and Torres Strait Islander Primary Health Care Certificate IV (Practice) to their scope
- Kimberley Aboriginal Medical Services Council (KAMSC, an RTO accredited to offer the
- Aboriginal and Torres Strait Islander Primary Health Care Certificate IV (Practice)
- Mount Isa Centre for Rural and Remote Health (MICRRH) and
- Queensland Aboriginal and Islander Health Council (QAIHC)
The program will commence with identifying the number and locations of eligible health workers willing to undertake the up-skilling program. An assessment process will follow to map out education needs and inform program delivery scheduling. Program delivery will commence in Queensland where, because of little Aboriginal and Torres Strait Islander Health Worker education activity, the need has been described as most likely greatest. Drawing on the experience of RTO and education partners, KAMSC and JCU a more detailed delivery plan will then be developed moving activity across northern Australia. A benefit of having multiple RTO's is the ability to plug Aboriginal and Torres Strait Islander Health Workers into a program of activity when, for unpredictable reasons, such as sorry business, prevent attendance at a critical residential block.

JCU has substantial capacity to undertake clinical skills training, having high tech training and simulation facilities already established across a network of sites across North Qld, JCU also has substantial experience in overseeing supported clinical placements and mobilising supervisors in clinical training sites relevant to students' future practice.

Tropical North Queensland TAFE (TNQT), with its major facilities in Cairns, currently delivers and has established relationships in many communities including remote communities on the Cape York and Gulf of Carpentaria regions of North Qld. Setting up a block mode of delivery for training in Yarrabah will be explored from the outset. The close proximity of Yarrabah to Cairns lends itself ideally to becoming a major setting for clinical placements.

P4) Joint transition plan with clear milestones for delivery of joint model of care, human resource support services and innovative shared IT system planning

Issues

There has been slow integration between the two service providers over the past 5 years since the Aboriginal community controlled health service became operational. For three years the two organisations (Gurriny Yealamucka and CHHHS) have been located in the same building however it is only in the last 12 months that patient records have been integrated. Partial transition to community control has created uncertainty about processes and timeframes. It has also left employees concerned about future employment and new employment conditions.

Solution

A joint transparent transition plan with clear milestones for delivery of a joint model of care, co-ordination of human resource support services and innovative shared IT system planning is required to ensure a smooth transition to community care. This involves an open process of consultation with employees and discussion of employment options once transition is in place. The CHHHS also need to clearly define what services will be directly supported by them ie. continuation of the Emergency Department and support for future renal dialysis services when they are provided on site.

Workforce Implications

A transition coordinator employed by Gurriny Yealamucka is in place and fulfilling an important role in progressing the proposed transition to community control. Migrating human resources and pay systems to a joint system is still a little way off and requires solid IT and business management support.

Implementation

In June it was agreed that transition be complete by July 2014. A comprehensive transition plan is being developed around that and the transition manager is in consultation with staff affected by the transition.
Reinforcing and expanding secondary care

S1) Locating renal dialysis services in Yarrabah through the implementation of a mixed funding “Kimberley model”.

Issues

Transporting renal dialysis patients to Cairns 3 times per week per patient is problematic on several levels. The GYHSAC minibus only has places for maximum of 11 people, there are currently 13/14 requiring dialysis treatment. Due to the length and frequency of the treatment this monopolises the transport resources available to Gurriny on at least 3 days per week. Patient health is also compromised by spending lengthy amounts of time in transit and a treatment that is hospital based and provided entirely by non-indigenous health personnel. In addition, there are limited renal dialysis chairs available in Cairns: 23 in total between the private and public hospitals combined.

Supporting data

14 patients currently require regular dialysis treatment (3 times per week) and another 4 known cases could require treatment in the next 12 months. This means by 2014, 18 patients could require 3 treatments per week. Each chair on a roster of 2 treatments per day and a 6 day a week operational roster is adequate for 4 patients. 18 patients would therefore require 4.5 chairs. Demand is predicted to rise at a rate of 2 – 4 patients per year over the next 10 years.

Solution

Locating renal services locally in the Yarrabah health facility with a private company providing and maintaining the equipment and staffed by a mix of renal nurses and renal trained Aboriginal and Torres Strait Islander Health Workers/Buddies would improve patient care, reduce transport costs, reduce on-going costs ($67 000 per patient per year in contrast to $100 000 per year in Cairns renal unit) and release much needed renal dialysis places back to the Cairns community.

KAMSC has recorded that patient outcomes over the years of introducing dialysis treatment locally have consistently improve therefore evidence to support this initiative is in available. “This is the first report showing similar mortality rates for Aboriginal and Torres Strait Islander people exclusively from a remote area of Australia and non-Indigenous Australians receiving HD treatment. Aboriginal community control of delivery of HD treatment in a remote location in partnership with good tertiary care can result in health outcomes similar to those of non-Indigenous patients while improving quality of life. While waiting for improved prevention to reduce the numbers of patients requiring dialysis, good quality care in culturally appropriate settings is essential. The continued creative expansion of culturally safe dialysis services in rural and remote areas of Australia needs to be a central part of providing equitable care to the growing number of Aboriginal and Torres Strait Islander people with end stage kidney disease.” (http://www.kamsc.org.au/research/Completed_Projects/HD_Study.html).

Workforce implications

Rather than employing only renal nurses to administer the treatment it would be preferable to train people locally, either Aboriginal Health Workers or family members willing to be paid buddies. They could work in tandem with the renal nurses. KAMSC are working on a 0.33 FTE per patient. This could be divided between Aboriginal and Torres Strait Islander Health Workers/Buddies and renal nurses. On a basis of 15 patients, 5 FTE staff would be needed; 2.5 nurses and 2.5 Aboriginal and Torres Strait Islander Health Workers.

* http://www.kamsc.org.au/ KAMSC (Kimberley Aboriginal Medical Services Council) is a regional Aboriginal Community Controlled Health Service (ACCHS) located in the Kimberleys, Western Australia.
Training implications

CHHHS has a programme in place to train family members to administer dialysis. This could possibly be extended to training Aboriginal and Torres Strait Islander Health Workers to perform dialysis. Can JCU provide training for Aboriginal and Torres Strait Islander Health Workers when new training centre established? There could be issues with Nurses Union re. training Aboriginal and Torres Strait Islander Health Workers to perform dialysis in a clinical environment. Need to investigate any possible issues in terms of accreditation.

Recruitment implications

There are always issues in recruiting nurses to remote communities such as Yarrabah and incentives such as car and petrol allowances, paid travel time and even providing accommodation should be considered.

Implementation

Joint integrated approach required. Pool current resources and employ staff by the same organisation. Queensland Health are currently assessing the resources currently allocated to treating Yarrabah dialysis patients in Cairns and the implication of re-allocating these resources to pay for treatment in the Yarrabah health facility. Equally, Gurriny could assess the savings of reduced transport costs.

3 main steps:

1. Launch a tender process would to find a company that provides chairs, machines, maintains the equipment and trains staff. Fresinious (http://fmc-au.com/) won the contract with KAMSC, however GAMBRO (http://www.gambro.com/en/global/About-Gambro/Contact/Gambro-locations/apac/Australia/) also supply a similar service. Note that KAMSC pay $70 per treatment to Fresinious inclusive of maintenance.

2. Approve a recruitment and training plan for a Yarrabah based renal service team.

3. Approach DOHA with a request for capital funding if new building required.

As of July 2013, the CHHHS plans to begin HD treatments in Yarrabah by the beginning of November 2013.
Estimation of weekly and annual funding required to run a renal dialysis clinic in Yarrabah per patient (10 to 20)

<table>
<thead>
<tr>
<th>Number of patients:</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
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</thead>
<tbody>
<tr>
<td>Total : PPT – Weekly $</td>
<td>2,100</td>
<td>2,130</td>
<td>2,520</td>
<td>2,730</td>
<td><strong>2,940</strong></td>
<td>3,150</td>
<td>3,360</td>
<td>3,570</td>
<td>3,780</td>
<td>3,990</td>
<td>4,200</td>
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<td>Staffing costs_AHW $</td>
<td>1,568</td>
<td>1,724</td>
<td>1,881</td>
<td>2,038</td>
<td><strong>2,195</strong></td>
<td>2,351</td>
<td>2,508</td>
<td>2,665</td>
<td>2,822</td>
<td>2,978</td>
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<tr>
<td>Staffing costs_Renal nurse $</td>
<td>3,135</td>
<td>3,449</td>
<td>3,762</td>
<td>4,076</td>
<td><strong>4,389</strong></td>
<td>4,703</td>
<td>5,016</td>
<td>5,330</td>
<td>5,643</td>
<td>5,957</td>
<td>6,270</td>
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<tr>
<td>Staffing costs_Total $</td>
<td>4,703</td>
<td>5,173</td>
<td>5,643</td>
<td>6,113</td>
<td><strong>6,584</strong></td>
<td>7,054</td>
<td>7,524</td>
<td>7,994</td>
<td>8,465</td>
<td>8,935</td>
<td>9,405</td>
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<td>Overheads $</td>
<td>1,411</td>
<td>1,552</td>
<td>1,693</td>
<td>1,834</td>
<td><strong>1,975</strong></td>
<td>2,116</td>
<td>2,257</td>
<td>2,398</td>
<td>2,539</td>
<td>2,680</td>
<td>2,822</td>
</tr>
<tr>
<td>TOTAL per week $</td>
<td>12,916</td>
<td>14,207</td>
<td>15,499</td>
<td>16,790</td>
<td><strong>18,082</strong></td>
<td>19,374</td>
<td>20,665</td>
<td>21,957</td>
<td>23,248</td>
<td>24,540</td>
<td>25,832</td>
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<td>Per Annum $</td>
<td>671,619</td>
<td>738,781</td>
<td>805,943</td>
<td>873,105</td>
<td><strong>940,267</strong></td>
<td>1,007,429</td>
<td>1,074,590</td>
<td>1,141,752</td>
<td>1,208,914</td>
<td>1,276,076</td>
<td>1,343,238</td>
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<tr>
<td>Chairs required:</td>
<td>2.5</td>
<td>2.75</td>
<td>3</td>
<td>3.25</td>
<td>3.5</td>
<td>3.75</td>
<td>4</td>
<td>4.25</td>
<td>4.5</td>
<td>4.75</td>
<td>5</td>
</tr>
</tbody>
</table>
**Assume:**

Patients require 3 treatments per week. Price Per Treatment (PPT) is $70. Cost per week per patient = $210.

1 Chair = 4 patients per week (0.25)

Staff/patient ratio ratio is approximately 1:3 or 0.33 FTE per patient. Divide between 0.165 AHW and 0.165 renal nurse.

Clinic is open 6 days a week and each chair provides 12 treatments per week.

Roster = Monday to Saturday for 8 hours per day. Clinic open for 48 hours per week.

Minimum staffing requirement of 4 at 24 hours per week. 10 patients require 125 hours per week of staffing allocation.

AHW = $25 per hour including on-going costs (NOT overheads). Working week = 38 hours. Cost per week = $950

Renal nurse = $50 per hour including on-going costs (NOT overheads). Working week = 38 hours. Costs per week = $1900

Each patient requires 0.165 nurse and 0.165 AHW per week.

Overheads calculated on a 30 per cent proportion of overall wage bill.

<table>
<thead>
<tr>
<th></th>
<th>AHW</th>
<th>Renal Nurse</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hourly rate (aprox)</strong></td>
<td>25</td>
<td>50</td>
<td></td>
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<tr>
<td><strong>Hours per week</strong></td>
<td>38</td>
<td>38</td>
<td>12.54</td>
</tr>
<tr>
<td><strong>FTE Cost per week</strong></td>
<td>950</td>
<td>1900</td>
<td></td>
</tr>
<tr>
<td><strong>FTE equivalent per patient</strong></td>
<td>0.165</td>
<td>0.165</td>
<td>0.33</td>
</tr>
<tr>
<td><strong>Staffing cost per patient per week</strong></td>
<td>156.75</td>
<td>313.5</td>
<td>470.25</td>
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<tr>
<td><strong>Overheads % of salary</strong></td>
<td>0.3</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td><strong>Overheads per staff member per patient</strong></td>
<td>47.025</td>
<td>94.05</td>
<td>141.075</td>
</tr>
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</table>
S2) Increase access to pharmacy services and increase revenue through take-up of Medicare funded medication review plans

**Issues**

There are no dedicated pharmacy services in Yarrabah at present as there have been issues surrounding the terms of a rental agreement between the pharmacy and the owner of the property (Queensland Health). This has led to less than adequate provision of medication and time delays in responding to scripts issued by the medical officers. Patients may have to make multiple visits to obtain medication and this can lead to lower take-up of medications prescribed as well as inconvenience.

**Solutions**

A sublease rental agreement is being drawn up and there is a tender expression of interest currently being advertised. However, due to the government being in caretaker mode at present the Director General of Queensland Health is unable to sign the agreement.

Increased revenue can also be generated by fully utilising the Medicare funded medication review plans.

**Workforce Implications**

A pharmacist will be needed in Yarrabah to staff new pharmacy. This will probably be provided by the current pharmacy provider in Edmonton on a rotational basis.

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S3) Expand the respite, palliative care and additional community support services that can be provided from Edmonton hub as opposed to Cairns

**Issues**

At present there are insufficient local high-level aged care places as well as disability/respite support services in the community. Currently local Aboriginal and Torres Strait Islander Health Workers are trying to fill the gaps without formal training, and often in their own time on the weekend.

**Solution**

Expand the respite, palliative care and additional community support services that can be provided from Edmonton and Gordonvale services as opposed to Cairns. Train Aboriginal and Torres Strait Islander Health Workers with advanced skills in these areas. More allied health service provision through FNQ Medicare Local to support local skilled-up service providers.

There are adequate staffing levels currently at Aged Care service but needs to grow in future to keep up with growing demand.

Use the new National Disability Insurance Scheme to fund additional disability services.

**Workforce Implications**

Train Aboriginal and Torres Strait Islander Health Workers with special skills in palliative care/respite care to work with support from Gordonvale QH providers. An Allied health assistant role could also be developed through training Aboriginal and Torres Strait Islander Health Workers.
Reducing demand on tertiary services

T1) With expanded skill-sets and remote support of the primary care team, a range of services currently requiring specialist outpatient review at Cairns (or Yarrabah outreach services) could be provided in the community, utilising telehealth consultations where required.

Issues

There are high volumes of costly ambulance transfers and lack of paramedical staff. Between 5 to 10 patients per week (on average in 2012, QH EDIS database) are transferred to the Emergency Department in Cairns per week from Yarrabah. This represents almost double the amount of transfers (per 1 000 population) than from other feeder hospitals in the CHHHS.

These ambulance transfers from Yarrabah to Cairns are extremely costly as each time a nurse escort is required at an average cost of $800 and in lost clinical time for the nurse (at least 2 hours for a round trip to Cairns).

Solutions

With expanded skill-sets and remote support of the primary care team, a range of services currently requiring specialist outpatient review at Cairns (or Yarrabah outreach services) could be provided in the community. Telehealth consultations and specialist shared-care plans can be utilised to minimise unnecessary follow-up visits and support staff in managing emergencies.

An Aboriginal and Torres Strait Islander Health Worker ambulance assistant role could be developed to assist with transport.

Workforce Implications

2 Aboriginal and Torres Strait Islander Health Workers could be trained as ambulance assistants and working on a roster to accompany paramedic with transfers. These ambulance assistants could drive, freeing up the paramedic to care for a very unwell patient. Their employment would be funded through cost savings in nurse time previously accompanying transfers.

Suggested increased provision of telehealth support for routine consultations or postoperative reviews would need to employ 1 administrator to streamline appointments between CBH and local providers. There is already a telehealth coordinator available who regularly visits the community from Cairns Diabetes Centre to provide training and support.
T2) Increased utilisation of telehealth would also reduce present volume of transfers with specialist services providing support to appropriately trained locally based GPs and nurses.

**Issues**

Throughout the consultation process the issue surrounding the high volume of poorly coordinated visiting allied health and specialist services has been raised.

**Solutions**

Increased utilisation of telehealth would reduce present volume of transfers with specialist services providing support to appropriately trained locally based GPs and nurses. They would also reduce Allied health visits as these could be coordinated with chronic disease/child health/rehabilitation clinics

Routine pre and postoperative visits or medical review visits could be conducted by planned telehealth consultation in conjunction with local health workers.

**Workforce Implications**

Tele-healthcare coordinator position necessary (as in T2).

T3) Strengthened primary care services reducing acute admission requirements

**Issues and supporting data**

There is continual growth in ambulatory care sensitive admissions from Yarrabah to Cairns. Ambulatory care sensitive conditions can be broken down into three categories:

- vaccine-preventable conditions, including influenza, tetanus, measles, mumps, rubella, diphtheria, pertussis and polio
- potentially preventable acute conditions, including dehydration, gastroenteritis, kidney infection, perforated ulcer, cellulitis, pelvic inflammatory disease, ear, nose and throat infections, and dental conditions
- potentially preventable chronic conditions, including diabetes, asthma, angina, hypertension, congestive heart failure and chronic obstructive pulmonary disease.

Between 5 to 10 patients per week (on average in 2012, QH EDIS database) are transferred to the Emergency Department in Cairns per week from Yarrabah. This represents almost double the amount of transfers (per 1 000 population) than from other feeder hospitals in the CHHHS.

- Studies undertaken by the AIHW\(^7\) on hospitalisations show that in Queensland, Indigenous people were hospitalised for ambulatory care sensitive conditions at four times the rate of other Australians (average from 2006-9).
Solution

Primary healthcare services need to be strengthened in order to reduce acute admissions to Cairns Hospital.

A sustainable primary healthcare system needs to ensure access to primary healthcare services which keep people well and manage ill-health.

Services need to be accessible, clinically and culturally appropriate and focused on encouraging self-management and preventive care, including support of healthy lifestyles.

As discussed in earlier solutions, the management of chronic disease is crucial in this community with high levels of chronic disease and co-morbidities. This requires a well-integrated and coordinated primary healthcare service which can provide continuity of care for those with multiple and complex conditions.

Better management of health information, underpinned by efficient and effective use of eHealth; including encouraging registrations for patient controlled electronic health records (PCEHR), will also strengthen the efficacy of the primary healthcare providers.

Workforce Implications

Additional Aboriginal and Torres Strait Islander Health Workers and community nurses/Nurse Practitioners will enable more efficient primary care delivery, through strengthened care coordination and outreach care provision. This needs to be supported by working environments and conditions which attract, support and retain workforce; and a high quality education and training arrangements for both new and existing workforce.

The medical workforce is currently sufficient, but expansion as a training hub will help to ensure sustainability into the future. There is a need to grow and strengthen the nursing workforce and particularly the need to build up the Aboriginal and Torres Strait Islander Health Worker workforce and the range of skills-sets that they cover.
Appendix C – Literature review on rural and regional health workforce planning and participatory approaches to health workforce planning

Introduction

‘Policy-makers in all countries, regardless of their level of economic development, struggle to achieve health equity and to meet the health needs of their populations, especially vulnerable and disadvantaged groups. ... Skilled and motivated health workers in sufficient numbers at the right place and at the right time are critical to deliver effective health services and improve health outcomes’.

The above quote from the World Health Organisation (WHO) encapsulates the overall aim of health workforce planning in Australia: having adequate numbers of health professionals with necessary skills in particular areas as required. This seemingly simple and straightforward objective, however, encompasses several complex and multi-faceted issues including Australia’s ageing population, increasing demand for health services, labour market forces, government policies and changing disease patterns and priorities. The national organisation, Health Workforce Australia (HWA) was established in 2008 to assist in addressing these issues and to coordinate strategic health workforce planning. According to the HWA, successful health workforce planning involves the following key areas: an understanding of the existing workforce including supply factors such as workforce size and composition and demand factors such as working hours and services used; estimating future workforce demand primarily via service utilisation data from multiple sources; estimating future workforce supply including the movement of people in the workforce, immigration and new graduates; and, scenario modelling which involves formulating different models and estimating their effect on the future workforce. As a result of these steps, gaps between estimated health workforce supply and demand can be identified and plans will be developed to redress or “close the gap” through workforce reform, training and/or immigration.

The gap between health workforce supply and demand has been an historical feature in regional and rural areas in Australia and indeed world-wide. At the core of this issue is the fact that approximately half of the world’s population resides in rural and remote areas, whereas the majority of health professionals live and work in urban areas. It is estimated that one billion people have no access to essential healthcare services and statistics indicate that even though half of the population live in rural areas, these areas are serviced by less than 25 per cent of the total physician workforce and 38 per cent of the total nursing workforce. The WHO states that there is substantial evidence to suggest that political intervention and resultant policy changes are effective in creating a more equitably distributed health workforce. Despite improvements in some areas, ongoing challenges to the provision of equitable health services persist and there has been an international call to action to ensure that all people have access to essential healthcare services, as demonstrated at the following events: the World Health Assembly 2004 and 2006, the Kampala Declaration, the G8 Communiqué, Commission on the Social Determinants of Health 2008 and Taskforce on International Financing for Health 2009.

HWA | Regional health workforce planning in north Queensland: starting with the end in mind 90
Methodology of the review

This literature review focuses on understanding regional and rural health workforce issues within the broader context of health workforce planning. Topics covered in the review include: models of health workforce planning, regionally based community needs assessments, rural and regional health workforce issues and community participation in health service planning. This review involved searching of journal articles and grey literature through the following process:

1. The global databases Pubmed, CINAHL and Scopus were searched.
2. The search terms used were: 'regional health workforce issues', 'rural health workforce issues', 'rural' AND 'health workforce', 'regional' AND 'health workforce', 'regional' AND 'rural' AND 'health workforce', 'health workforce planning', 'health' AND 'workforce planning', 'health' AND 'workforce' AND 'planning', 'health needs assessment', 'community health needs assessment', 'needs assessment', 'regional' AND 'health needs assessment', 'regional' AND 'community health needs assessment', 'regional' AND 'community' AND 'health needs assessment', 'participatory health service planning', 'community participation' AND 'health service planning', 'consumer participation' AND 'health service planning', 'community input' AND 'health service planning', 'consumer input' AND 'health service planning', 'community participation in health service planning', 'consumer participation in health service planning', 'regional health planning', 'health workforce in Australia', 'Australian medical workforce', 'medical workforce in Queensland', 'medical workforce in QLD'.
3. Limits were years 2000 onwards and English language.
4. Author searches were conducted for the following authors: Leonie Segal, Deborah Schofield, John Humphreys, John Wakerman, Jane Farmer.
5. Google search of the following websites produced the majority of grey literature found
6. Searches yielded 153 relevant journal articles that have been entered into an Endnote library. Bibliographic searches were also used to supplement this resource, and additional searches to supplement literature on nursing and allied health workforce.
7. Searches yielded 34 relevant grey literature documents that have been entered into an Endnote library.
Models of health workforce planning

Health Workforce Australia

Scenario modelling has been consistently used in health workforce planning by HWA, as it allows for “alternative futures to be modelled (and measured) by varying input parameters”\(^1\). The scenarios modelled estimate the most likely outcome of a series of conditions and inputs. In a document published in 2012 to predict Australia’s health workforce requirements up to 2025, HWA employed the following alternative scenario models: innovation and reform, immigration and training. Innovation and reform models involve improvements in work practices and the overall work environment. These models are further divided into productivity, low demand and workforce retention models\(^1, 35, 36\). As the name suggests, the productivity model relates to productivity in the workplace and within the HWA report the specific value assigned is a five per cent increase in productivity. The improvement in productivity is not attributed to a particular cause/s but considered to result from a combination of factors such as technological change, expanded scope of practice and improved models of care. The low demand model outlined by HWA relates to a decrease in demand for health services in the general population as a result of health reforms or systemic changes; and, the workforce retention model involves decreased exit from the workforce due to an improved, flexible and supportive work environment\(^1\).

The second HWA scenario based model relates to immigration. Australia is dependent on temporary and permanent immigrants to meet health workforce needs currently\(^1\). The self-sufficiency model falls within this category and outlines a model where Australia’s current reliance on the migration of health professionals is reduced and there is a reduction of at least 50 per cent of the current reliance on international health professionals. And finally the training scenario model is an impact based model that analyses the effect of both the innovation and reform and immigration models and how changes associated with those models influence training requirements for health professionals\(^1\). The training scenario involves several categories, including: higher education and training pipeline analysis, high demand scenario, undersupply-existing workforce imbalance, capped working hours, graduate growth scenario, and comparison scenario. Higher education and training pipeline analysis estimates both the number of graduates and vocational training places required to ensure that health workforce demands are met by adequate health workforce supply. The high demand scenario evaluates the impact that increased demand of health services will equate to in terms of additional staff required; the undersupply-existing workforce imbalance highlights the fact that there is a pre-existing shortage in the health workforce; the capped working hours category investigates the impact of reducing the working hours of all doctors and capping working hours at 50 hours per week; the graduate growth scenario is limited in the HWA projections to registered nurses only; and, lastly, the comparison scenario that is a technical modelling tool employed to illustrate the effects of other scenarios\(^1\).

Australian Medical Workforce Advisory Committee

Until quite recently (2006), medical workforce modelling was undertaken by the Australian Medical Workforce Advisory Committee (AMWAC) as part of their workforce planning processes\(^37\). The AMWAC’s workforce planning methodology included a descriptive analysis and evaluation of the current medical workforce, prediction of the future workforce and workforce modelling using a calculation tool. During the descriptive analysis, the current existing workforce was recorded within the parameters of numbers in each area, number of hours worked per week, qualifications, ethnic background, age and sex\(^37\). The full time work equivalent count (FTE) was also calculated, service provision was detailed, distribution of workforce was mapped, and new entrants and those exiting the workforce were accounted for. Data were compared and cross tabulated and validated by other data collection sources, such as Medicare records and the Australian Bureau of Statistics. Evaluation of the current workforce took place which illustrated whether there was a shortage or excess in supply. The indicators used in the evaluation phase were: number of unfilled positions, waiting times for consultations and surgical procedures, number of hours worked above 80 hours per week, cost of the service, ratio of practitioners versus the population, views of the specialist practitioners, and quality of service provision from the perspective of the consumer or carer and the referring practitioner\(^37\).
AMWAC’s predictive analysis stage included predicting workforce supply and workforce requirements. Predictions relating to workforce supply were estimated by using the descriptive analysis of the current workforce and then adjusting this according to estimated additions and losses in the workforce. Predictions relating to workforce requirements/demands were based on five future scenarios: models of care, needs, utilisation of services, effective care/demand, and effective infrastructure. Models of care are formulated in specific medical areas, for example emergency care or aged care, and are based on preferred patient outcomes. The method involving needs was based on an assessment of the needs of the population, which is not the same as the demands of the population. Utilisation of service was based on current service provision data; this method was not as accurate as a needs assessment at illustrating need, as services provided are already constrained by workforce supply issues. That is, if a service is not available due to workforce constraints it cannot be used and there will be no service utilisation data regardless of whether the need for the service exists in the population. Effective need/utilisation method allows financial constraints to be factored into analysis of need and utilisation. And finally, effective infrastructure enables consideration of equipment, buildings and other infrastructure required in the particular area, as health workforce will not be effective without the required equipment and infrastructure.

AMWAC then employed a specialist medical workforce calculation tool to project future supply and requirements. There were three parts to modelling and descriptive and predictive analyses were used in this process. The first step involved entering the workforce profile which is based on the descriptive analysis. The second step related to the supply trend and the third and final step related to the requirements trend. Both the supply and requirements trends were based on the predictive analysis conducted already. The model is then used to compare the two trends and provided information on whether the workforce was balanced or unbalanced in a specifically defined future projection period. Similar processes of modelling were used in health workforce planning for general practitioners, medical students, nurses and allied health staff. AMWAC completed a report on the general practice (GP) workforce in Australia in 2005. The current GP workforce was analysed using descriptive analysis and evaluation. Predictive studies of the workforce supply and requirements were undertaken and this was followed by modelling. Results were generated from three different modelling scenarios, each which differed on the estimated GP workforce shortage used as a baseline figure from 2002. In the analysis of the results, it was pointed out that policy developments since 2002, that included a 25 per cent increase in federally funded medical places from the year 2000 and the establishment of five new medical schools, would cause a substantial increase in the number of domestic medical graduates and the effects of this increase would only be realised towards the end of the decade given the lengthy training process involved in educating and training doctors. Furthermore, the Australian Government’s Strengthening Medicare 2003 policy increased opportunities for overseas trained doctors to practise in Australia and would also result in an increase in the medical workforce in Australia. AMWAC processes were superceded by the Medical Training Review Panels, which have now in turn been replaced by HWA processes.

Supply side issues with modelling

One of the major challenges in health workforce modelling is the ability to account for the complexity of the health system and its multiple influences within modelling tools. Segal and Bolton (2009) challenge the dominant perception that there is a workforce shortage caused by an ageing population in Australia on the basis of over simplistic modelling tools and a lack of understanding of the complex interactions between supply and demand factors in the health workforce. According to Segal and Bolton several supply issues relating to the Australian health workforce have commonly been overlooked in workforce planning and the emphasis has been on workforce shortages. The rationale for predicting future shortages in based on factors such as the increasing age of health professionals, lower average hours completed per worker, high staff turnover and high exit rates.
The increasing age of the workforce has been identified as a critical factor and has been associated with resultant declining workforce numbers. However Segal and Bolton argue that policies which have been introduced to delay retirement, for example changes to superannuation regulations, have in fact contributed to people remaining in the workforce for longer and therefore having higher workforce participation rates as they age. The authors further state that there is an increase in female workforce participation rates in all categories due to “delayed child rearing, smaller family size, policy changes and changes in community attitudes”. And, workforce participation rates for women over 55 years with post school age children are estimated to increase significantly in the next 20 years. Furthermore, these authors suggest that an older workforce is likely to have increased productivity through greater skill levels and more experience.

Another policy initiative that has been identified to favourably affect workforce supply is innovative changes to traditional health workforce roles. The introduction of nurse practitioners and new allied health staff has caused an expansion and diversification of the skill mix of the health workforce. Finally policies related to overseas trained health professionals have seen an increase in temporary and permanent migration of internationally trained health professional work in Australia. After consideration of the above supply factors, Segal and Bolton conclude that Australia’s health workforce is actually growing, and it is also highly responsive to policy changes, indicating that future supply issues can be remedied with changes to policy in an effective manner. These trends are confirmed by census data which shows a growth in the Australian health workforce of three per cent per annum in the 2000 to 2008 period compared with overall population growth of 1.2 to 1.5 per cent. Additionally, the Australian Institute of Health and Welfare states in a 2006 report that the number of people working in health has increased from 18 per cent in 2000 to 26 per cent in 2005.

Joyce, McNeil and Stoelwinder suggest that perceptions of health workforce supply swing from predictions of surplus to shortage and such cyclical trends in perception are also evident in the United States, Canada and the United Kingdom. They state that whilst Australia has been in the forefront of health workforce planning, methods and modelling processes need to evolve to include new developments in the workforce. The authors emphasise the importance of routine data collection and identify existing gaps in information in areas such as the changing profile of medical graduates. In 2004, one in three places in Australian medical schools was for graduate entry students, who were older and in “addition to having less time to spend in the medical workforce, graduate-entry-program graduates may follow different career pathways compared with graduates of traditional programs”. However, it is uncertain as to whether career pathways of graduate students are in fact different to undergraduate students, as there is no data to substantiate this yet. The increasing number of older students and corresponding less time to be spent in the workforce might suggest future shortages. However, in contrast to this are statistics that show significant increases in domestic graduates from medical schools with predictions of an 81 per cent increase from 2005 to 2012. Such figures warn of an oversupply of doctors and a shortage of prevocational training places and the catch phrase coined about these issues is the ‘tsunami of medical students’: “the wave of students flowing into the Australian medical workforce represents substantial growth”. Additionally the number of international graduates doubled from 10 per cent to 20 per cent from 2000 to 2006.
Demand side issues with modelling

Segal and Bolton (2009) identify a fundamental issue with current demand side workforce modelling to be the lack of differentiation between expressed workforce demand and underlying need. Expressed workforce demand is defined as the number of positions funded in the health workforce (based usually on service utilisation), whereas underlying need relates to the workforce required to meet the populations’ health needs effectively. The former will have the perverse consequence of reinforcing inequity, through perpetuating in future planning low service delivery due to absent service utilisation in a particular area, reflected as low demand. The authors suggest that underlying need rather than expressed workforce supply is required in health workforce planning. Segal and Bolton also question the current reasoning for predicting increased demand for healthcare services due to an ageing population in Australia on the basis of the uncertain nature of the ageing process and the lack of evidence to demonstrate that ageing is an independent determinant of healthcare costs. What data appears to prove is that health workforce requirements are strongly correlated with illness and health expenditure increases with proximity to death. This is substantiated by risk adjustment models for insurance companies that indicate health status is a ‘primary driver’ of healthcare costs. However, as illustrated with supply side modelling issues, the situation is complex and contradictory evidence exists. Rising rates of obesity and diabetes would in fact increase healthcare costs as the population ages and incidence of some of these conditions increases with ageing.

This thinking has been further developed by Segal and Leach (2011), who have used detailed available population data and best available clinical practice guidelines for diabetes to try to conduct more detailed and nuanced demand side modelling of exactly what skills and workforce are needed to meet population health needs, adjusted to various features of the population that may affect care requirements or influence ability for self-care.

Deterministic versus stochastic modelling

Joyce, McNeil and Stoelwinder (2004) emphasise the importance of sophisticated and dynamic modelling that has the ability to accommodate numerous variables and changing conditions in health workforce planning. Current Australian models use a stock and flow method with projections from an established base line. The models generally provide useful information on supply and demand issues in workforce planning but are limited in predicting for factors that lack data. Areas lacking in adequate data include: career preferences of graduates, re-entry to the workforce after temporary exit, availability for clinical time, productivity, technological changes in diagnosis and treatment and community expectations. There is also a dearth of longitudinal data in all areas. Another limitation of the deterministic models currently employed in health workforce planning is the inability to account for the inherent uncertainty in the complex health system. The authors suggest that this would be alleviated by the utilisation of stochastic models that use “random numbers and probabilities to reflect uncertainty.” Stochastic models also have the capacity to generate statistical experiments that use statistical analysis to illustrate the impact of changes to the system being modelled.
Regionally based community health needs assessments

According to the Primary Healthcare Research and Information Service (PHCRIS), a health needs assessment is the first step in planning healthcare services effectively. A health needs assessment is a systematic process that aims to identify the health and healthcare needs of a particular community or region at a specific time. It includes a wide range of activities such as: collecting information, analysing results, meeting with stakeholders, prioritising needs and designing interventions that address priority needs. The overall aim of a community health needs assessment is to improve the health of the community evaluated. A needs assessment often includes qualitative and quantitative data and collection of information from a range of sources will increase the reliability of the results gathered. A preliminary step in a needs assessment is definition of the term ‘need’. Pain, Evans, Larkins, Waugh and Taylor (2011) identify the three following definitions of the term ‘need’: assessment in comparison to the ideal, assessment in comparison to a minimum standard, and assessment compared to what others have achieved. Needs can also be defined by different groups of people and are named differently depending on which group defines them. Needs as defined by the community are called felt needs; needs defined by experts are called normative needs; and, needs as defined by precedence are called comparative needs. There is the further category of expressed needs which is needs as defined by a population’s service usage. Success of a needs assessment is dependent on careful planning. The critical steps identified include: establishing a team of staff to carry out the needs assessment, having clear aims and objectives, designing the assessment, ensuring implementation of the assessment, utilisation and dissemination of the results of the assessment.

Katterl et al (2012) identify several specific aims of a needs assessment within the primary healthcare setting which all fall under the general and overall aim of achieving positive change to the health of the population. Specific aims of a primary healthcare needs assessment include: delivering effective care to those in the population who have greatest need, ensuring health services practice equity and within the framework of social justice, allocation of scarce resources in a way which maximises benefit to the community, forming community collaborations to address priority health needs and identifying services and activities that impact healthcare. This report summarises several models for regionally based health needs assessments and emphasises that the method employed in a regionally based health needs assessment depends on factors such as the scope, aim, resources and time frame of the assessment. A global approach utilises epidemiological data and information on available health services to identify gaps in healthcare. An epidemiological approach concentrates on incidence rates for different diseases and mapping of existing services. A community based approach focuses on identifying need from the perspective of the community. A comparative approach reviews the region’s services in comparison to another region’s services. A corporate approach is based on the perspective of a group of experts. And, a life course approach is based on stages of life and the risks of developing chronic diseases.

Several regionally based needs assessments have been carried out internationally. For example, in England the Primary Care Trusts have carried out needs assessments which aim to identify local needs and priorities approximately once every three years to coincide with and inform Local Area Agreement planning cycles. In New Zealand, District Health Boards have carried out needs assessments that aim to evaluate the benefits gained by the population as a result of health services prioritised within a framework of cost constraints. The frequency of the needs assessments in New Zealand was once in three years to fit in with a five to ten year planning cycle. In reviewing several international models for regionally based needs assessments, this PHCRIS report identifies several points to consider and discuss in similar style needs assessments in Australia. Areas flagged for consideration include: the political and strategic context of the region, comparison of national and regional data sources, availability and usefulness of data, differences in national and regional needs, processes of community engagement, the process by which needs are prioritised and the potential this has for conflict, costs and time frame of the assessment, and the resources and skills of staff involved in the assessment.
The area encompassing national and regional or local needs is one of much debate and has been the focus of several community health needs assessments. A study conducted by Syson-Nibbs, Saul and Cox compared the health status of a rural farming community with a non-farming community in the United Kingdom (UK) and reported significant differences between the two groups\textsuperscript{44}. The authors used a questionnaire to survey those within the farming community from a selected general practice and then compared these results to the results of the non-farming community, who were also provided with the same questionnaire and were serviced by the same general practice. The outcomes measured in the survey included: income, overall and general health status, perceptions of quality of life, musculoskeletal problems, mental health status and service usage\textsuperscript{44}. Within this study, farmers were identified as the group with significantly greater health needs. Results showed that farmers had higher incidence rates for asthma, hypertension, hernias and angina or heart disease. Farmers, however, accessed health services less than the non-farming group and this included presentation to their family doctor, community nurse, and accident and emergency department. The authors call for a more extensive and wider epidemiological study across the farming groups in the UK to better understand the rural population in this region\textsuperscript{44}.

A health needs assessment conducted in rural Kansas also focuses on health disparities caused by rurality and the additional factor of ethnicity\textsuperscript{45}. This study included people of Hispanic ethnicity living in rural south west Kansas. It employed the use of an Hispanic health needs assessment tool designed by the National Alliance for Hispanic Health to assess the health status of a group of people within the parameters of access to healthcare, nutrition, weight, physical activity, diabetes and heart disease. Health data from the United States shows that Hispanics are the fastest growing minority group in the country. Individuals of Hispanic origin however have higher rates of chronic diseases that impact their morbidity and mortality in comparison to the general population\textsuperscript{45}. Further exacerbating the issue of higher rates of chronic disease is the fact that Hispanic people are generally in lower socio-economic groups and consequently have reduced access to healthcare services. The needs assessment conducted in Kansas was aligned with the overall Healthy People 2020 program in the US, which aims to reduce health inequities in this region through increasing awareness of health inequities, recording the extent of reduced access to healthcare experienced by people in underserved groups, and designing culturally appropriate and acceptable programs that assist in reducing the chronic disease burden within underserved groups\textsuperscript{45}.
Rural and regional health workforce issues

The issue of shortages of health workers in rural and regional areas has been well documented and it is a topic of interest to researchers and policy makers to formulate and implement strategies that reduce the shortage of health workers in these areas. As highlighted early in this review, half of the world’s people live in rural and regional areas and yet only 38 per cent of nursing professionals and less than 25 per cent of medical professionals work in these areas. Addressing and changing this situation has been prioritised by the WHO and is also included within the United Nations Millennium Development Goals. In a 2010 document, called “Increasing access to health workers in remote and rural areas through improved retention”, the WHO provides several evidence based recommendations related to increasing the number of health workers practising in these areas through “improved attraction, recruitment and retention”. The WHO’s recommendations are grouped into the categories of education, regulation, financial incentives, and personal and professional support.

Education recommendations include the following strategies: admission policies that include students with a rural background who are likely to practise in these areas, health education schools and campuses located outside of major urban areas, inclusion of rural health topics in undergraduate and postgraduate curriculum, exposure of undergraduate health students to rural communities which potentially attracts them to work in these areas, and designing continuing professional development programs which can be accessed by rural and regional health professionals. The regulatory recommendations include: the introduction and regulation of enhanced scope of practice for health professionals practising in rural and regional areas to increase potential for job satisfaction, introduction of different types of health workers which will increase numbers in rural and regional areas, provision of scholarships and bursaries for students with enforceable return of service requirements to increase numbers of health professionals in these areas, assurance that support and incentives are provided in these areas so that those individuals fulfilling compulsory service requirements are more likely to continue working in rural and regional areas after their compulsory service requirements have been fulfilled. The financial incentives recommended by the WHO involve provision of benefits that outweigh costs to health professionals working in rural and regional areas. They include items such as paid leave, transport and housing subsidies, and hardship allowances. Personal and professional support recommendations include improved living conditions for health workers and their families, a safe and well equipped work environment, outreach services from the nearest better served area to the underserved area, career development programs, support for health workers through professional networks, and public recognition of the positive and important contribution made by these health workers to the community.

The rural and regional health workforce in Australia

An audit of the rural and regional health workforce in Australia completed in 2008 describes overall trend of low to very poor supply of medical workforce, relatively even supply of nursing workforce and low to poor supply of other health professionals in rural and regional areas. Access to health professionals is considered to be a significant challenge in rural and regional Australia with ‘system wide shortages’ described in these areas. In order to address the long standing issue of medical workforce shortage in rural and regional areas, the Australian Government introduced the Rural Retention Program (RRP). The main objective of this program is to provide financial incentives to doctors working in rural and regional areas to encourage them to practise in these areas for longer. “The RRP specifically targets the income concerns of rural and remote GPs by offering financial incentives based on location and length of service”. The criterion for payments is continuous service in eligible locations after a qualifying time period. Once the qualifying time period is completed, payments are made and continued, provided the doctor practises continuously in the eligible area. A review of the RRP concludes that the program is effective in retaining GPs to these areas in the short term. However, effectiveness of this program over the long term is questioned on the basis that financial gains are not the only consideration of medical professionals working in these areas. Lifestyle, family and philosophy are identified as factors that influence an individual’s decision to work in a rural or regional area. Additionally, factors such as equipment, working hours, housing and support from peers are also identified as influential in retaining staff to a workplace or area and none of these are addressed by the RRP. In Australia, a government sponsored review of rural incentive programs is currently underway.
Maldistribution of health professionals

Chen describes maldistribution as the most critical challenge of the health workforce, as it prevents the provision of universal healthcare to all people and it is closely associated with workforce shortages and skill imbalances. As indicated by the term, maldistribution refers to the unequal distribution of health workers globally and the result of such inequitable distribution is a lack of healthcare services for many people worldwide. As stated earlier in this review, one billion people in the world have no access to essential healthcare services and are deprived of the human right to health and maldistribution of the health workforce is a major cause of this. Chen describes that the problem does not necessarily relate to shortages in numbers of health workers, as what is often described as a shortage is in actual fact an oversupply of workers in metropolitan areas, as evidenced by unemployment rates in urban areas, and an undersupply of workers in rural and regional areas, as demonstrated by high levels of vacancies in these areas. Maldistribution is a common issue in all countries that have market based economies and allow health workers to exercise autonomy in selecting a work place. The overwhelming trend in the majority of health professionals’ choice of work place and residence is urban areas.

Larkins, Sen Gupta, Evans, Murray and Preston also identify the issue of maldistribution of the health workforce as a major cause of limiting global access to primary healthcare services. These authors suggest that current models of medical education do not address the issue of equitable distribution of physicians and commitment to provide health services to people in underserved groups, those who require medical care the most. Strasser and Neusy (2010) highlight the importance of training medical students in context (i.e. in areas of greatest need), as an important strategy to mitigate against maldistribution. Statistics show that countries with high incomes have more than 10 doctors or nurses per 1000 people whereas countries that have the lowest incomes may not even have one doctor or nurse per 1000 people. And yet the highest need and highest disease burden rates are evident in the poorest countries which have a worst access to healthcare workers. The issue of health workers practising in these developing countries is often exacerbated by recruitment of health professionals trained in these areas going overseas, often to regions with greater wealth.

Martineau and Willetts point out even though there are codes of practice for the ethical recruitment of international health professionals, it is unclear whether these measures are protecting healthcare resources of developing countries and regions that most require healthcare. For example, migration from both sub-Saharan Africa and South Africa to the UK has increased significantly despite the introduction of the first ethical guidelines by the Department of Health in England. Indeed the general trend observed globally is the increasing movement of health workers from developing countries to developed countries. The UK is not alone in its reliance on internationally trained health professionals. This trend is evident in the USA and also in Australia. In 2007 in Australia, 41 per cent of the doctors practising in rural and remote areas were trained internationally. Martineau and Willetts point out that there are strong forces at play in this scenario that include employers determined to solve their own workforce shortages, recruitment agencies whose profitability depends on migration of international health workers and individual health professionals who stand to make substantial financial gains through migration: “for example from £77 a month as a specialist nurse in India to £1,250 working on a general medical ward in the UK”.

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Access to and recruitment of health professionals in rural and regional areas

Reduced access to healthcare in rural and regional areas is caused by the shortage of healthcare professionals servicing these areas. To assist in rural workforce planning within the medical sector, the Medical Schools Outcomes Database and Longitudinal Tracking Project (MSOD) was established in 2005. The MSOD tracks all medical students attending universities in Australia and New Zealand from their entry into medical school through to vocational training in the workforce. Students complete a questionnaire upon entry to and exit from medical school, all clinical placements and electives are recorded by medical schools and intern and vocational training is tracked. The questionnaire includes information on demographics, income, education, practice intentions and importantly gives insight into what motivates an individual to work in rural and regional areas.

Gerber and Landau describe that several factors have been identified as drivers for rural practice and these include variety in work carried out, professional support and on-call arrangements. Several additional factors are identified in the review of the RRP as drivers of rural work as described previously in this review including lifestyle, family, housing and working hours. Most of these results and conclusions have been reached through cross sectional studies however which are limited in their ability to form connections over the long term. Cross sectional studies take a ‘snap shot’ of a situation at a given time and comparisons between studies taken at different times are likely to lack meaningful connection. Evaluation of rural workforce planning in Australia and New Zealand recommended a need for longitudinal, tracking studies and uniform data collection methods.

The MSOD is a longitudinal study and up to 2009 data was collected via the MSOD on 11200 medical students in Australia using “an agreed national minimum dataset based on consistent definitions”. Results from the MSOD show that the prediction of practice in rural and regional areas is strongly correlated to the following factors: length of residence in a rural area, intention to practice as a generalist and financially supported study. Results also show interesting trends about practising in rural and regional areas related to the age of medical students. Students who express intentions to work in rural areas and ‘stay rural’ are likely to be older whilst students who change their intentions and are categorised in the ‘going rural’ group are similar age to those in the ‘city groups’. Gerber and Landau conclude that based on these results, age would be an effective criteria for applicants who intend to work rurally. MSOD has the capacity to track those students who move to urban practices and also provide evidence to substantiate the suggestion that some students complete vocational training in urban areas and then return to service in rural and regional areas. Other areas of interest in addressing access to healthcare in rural and regional areas that are recorded and evaluated by MSOD are: the impact of rural placements (including timing and length of the placement) and the impact of the location of the medical school (metropolitan or regional).

A proven strategy for recruiting health professionals to rural and regional areas is via the ‘rural pipeline’. The rural pipeline is a recruitment strategy that involves selecting students from rural backgrounds into health related tertiary study located in rural areas, emphasising and consistently including rural health issues in the curriculum, providing numerous rural clinical placements and setting up postgraduate training in regional areas. Each of these strategies align closely with the strategic education recommendations of the WHO’s report titled “Increasing access to health workers in remote and rural areas through improved retention”. Murray and Wronski state that the effectiveness of the rural pipeline is proven and it will make a significant contribution to building a larger rural health workforce. In Australia in 2006, 20 per cent of medical students were classified as being of rural origins and are therefore more likely to practise in these areas. Murray and Wronski emphasise the importance of adequate support in regional areas for clinical teaching and research as they are closely linked to the provision of high quality health services in these areas.
In Norway, providing medical internships and postgraduate training in rural areas has proven to be a successful strategy in recruiting more health professionals. In Finnmark, a rural northern region of Norway, an 18 month internship along with professional and social support is provided to students after graduation from medical school\textsuperscript{55}. Evaluation of the program showed that twice as many graduates as expected took up internships in Finnmark and an internship in this region increased the likelihood of individuals choosing to pursue a career in primary healthcare, a priority area in Norway. Professional support provided during the internship included regular meetings and tutorials with peers\textsuperscript{55}. Another study from Norway related to postgraduate training also showed that rural practice is a suitable setting for such training when combined with tutelage and in-service training\textsuperscript{56}. Postgraduate training in general practice/family medicine in Norway is carried out through in service programs to avoid centralisation of training locations. Physicians enrolled in this program attend regular training in-services in regional locations and the government covers all costs associated with attendance at these sessions. This postgraduate training program has yielded positive results with statistics showing reduced vacancy rates for primary healthcare physicians in Finnmark\textsuperscript{56}.

**Retention of health professionals in rural and regional areas**

Workforce retention is a measure of length of stay in a workplace; it is distinct from workforce turnover which refers to the number of people leaving the workforce\textsuperscript{57}. Retention is an important issue in rural and regional areas as there is an existing shortage of health workers in these areas and workers who have been retained in these areas often have increased local knowledge and skills particularly relevant to the local population. There is no set time period which defines retention. Retention is related to recruitment which focuses on attracting and selecting staff to work in an area. Effective recruitment strategies would select candidates who are likely to stay in a work place for a significant amount of time\textsuperscript{57}. Humphreys, Wakeman, Pashen and Bukyx identify that there are numerous factors that affect retention: financial and economic, professional and organisational; social including family and personal and external which includes location and community.

According to Humphreys, Wakeman, Pashen and Bukyx, financial and economic considerations have been effectively used as a recruitment strategy. However, in Australia their effectiveness as a retention policy is uncertain: “The RRP cost A$22 million in the 2007-2008 Budget. The post hoc evaluation was unable to determine the program’s effectiveness as a retention strategy”\textsuperscript{57}. Professional and organisational factors are important in retaining workers in rural areas and whilst there is often more variety and responsibility in rural scope of practice, isolation and unavailability of professional development contribute to turnover of rural staff\textsuperscript{57}. However, if peer support and continuing professional development is offered in these areas retention rates are increased. This is confirmed in a study of factors affecting retention of rural GPs in Australia which also showed that professional considerations were the most important factors influencing GP retention in these areas\textsuperscript{58}. Professional factors that were identified in this study that drew its results from a survey of a sample of GPs included: on-call arrangements, professional support and variety of rural practice\textsuperscript{58}. Two longitudinal studies carried out in Australia further substantiate the importance of professional factors in improving retention rates. The studies conducted in Western Australia and Queensland illustrated that professional satisfaction through variety of work, autonomy in practice and the recognition that such work was important in the community was identified as the main reason for remaining in rural practice\textsuperscript{59}. Other considerations that are associated with increased retention are: adequate equipment and supplies, administrative and managerial support and flexible working hours.

Family and personal factors also influence retention rates in the rural health workforce. Individual beliefs relating to values, philosophies and career goals affect an individual’s choice of workplace. Higher rural retention rates are generally seen in older people of rural origin living with their family, who enjoy the rural lifestyle and establish professional and community networks in their place of residence\textsuperscript{57}. The needs of the health workers’ family were also influential in decision making about staying or leaving a rural area. If secure housing, employment opportunities for their spouse and educational opportunities for their children are available, the health professional is more likely to remain in the area. External factors related to geographical location (climate, natural/environmental surroundings and proximity to capital city) and community (community groups, cultural activities and recreational facilities) also play a role in influencing retention rates. Veitch and Grant suggest that rural communities can assist in the retention of health workers to their community by helping workers and their families to integrate into the community\textsuperscript{61}. 

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\textsuperscript{55} Humphreys, Wakerman, Pashen and Bukyx, 2003.

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\textsuperscript{61} Humphreys, Wakerman, Pashen and Bukyx, 2003.
The variety of factors influencing retention and their interplay is further substantiated in a review of incentives for retaining health workers in the Asia-Pacific region. According to Henderson and Tulloch, surveys show that health workers leave their positions for better remuneration and training opportunities, improved working conditions, political stability and educational opportunities for their children. On the other hand, health workers tend to remain in their positions if they hold senior positions, have good remuneration rates and work in favoured locations. These authors suggest that retention incentives need to be tailored to specific areas and that evidence based research shows that a packaged range of incentives would be most effective in retaining health workers. Incentive packages that combine improved remuneration packages, better workplace conditions, administrative and managerial support, continuing professional development, employment and educational opportunities for families of health workers and community involvement and recognition would positively influence retention of these workers. Furthermore region specific strategies require an understanding of the cause/s of the health worker shortage. Overall the authors suggest that continued research and evaluation is required to expand the knowledge base and provide evidence as to the efficacy of incentive programs.

Kamien and Cameron advocate for a multifaceted and integrated approach to retention schemes that build upon existing knowledge of what is required to sustain viable rural practices and which also reflect the current environment of doctors: “a work environment that is attractive to the increasing number of women in medicine and general practice, that encourages a healthy lifestyle for doctors, and that educates communities to be more aware of doctors’ needs, as we educate doctors to be aware of patients’ needs”. Dolea, Stormont and Braichet in their evaluation of several strategies to increase recruitment and improve retention of health workers in rural areas identify important areas for improvement in this area. They conclude that strategies that are successful in recruiting health workers to rural areas are responsive to the preferences of health workers which ultimately determine choice of work place. However, in most cases the retention strategy designed has not adequately found out or taken into account the health workers preferences. Dolea, Stormont and Braichet point out that policy-makers tend to favour financially based incentive programs for recruitment and retention despite their being a lack of evidence as to the effectiveness of such measures. Furthermore, there appears to be a reluctance to design incentives based on professional and personal support, even though these factors consistently feature as most important determinants of whether a health professional stays or leaves a rural or regional area.
Community participation in health service planning

Community participation in health service planning, particularly within primary healthcare, has been associated with better health outcomes\(^6\). Community participation in this context is defined as collective action and input of people from a specific region or area into defining their health needs and formulating strategies and programs that meet these needs. Community participation in rural health service planning is recognised as being integral to the success of health programs and initiatives. The National Rural Health Alliance (NRHA) identifies that involvement of local communities in the development of health service models is necessary for their success: “Mechanisms have been developed to support involvement of communities in developing solutions and service models that reflect their needs and circumstances.”\(^6\). Benefits of community participation include: improved health outcomes for the community, design and implementation of programs in a culturally safe manner and improved access, acceptance and satisfaction with the services established\(^3\).

Whilst it is acknowledged that community participation is important in service planning in rural Australia, Taylor, Braunack-Meyer, Cargo, Larkins and Preston (2012) argue that such participation is increasingly important in all areas in Australia, as it has significant potential benefits in chronic disease prevention. According to these authors the health system in Australia requires innovative strategies to address the increasing incidence of chronic diseases and the associated burden of chronic diseases on the healthcare system\(^5\). Partnerships between communities and healthcare organisations are necessary to encourage people to remain healthy and reduce their risk of chronic diseases. Four types of partnerships between community and health sector organisations are defined: contributions, instrumental, empowerment and developmental\(^5\). Within the contributions framework, community participation is viewed as voluntary contributions to a project that is coordinated by professionals from outside the community, who decide on how the contributions from the community will be used. Community contributions can take the form of time, knowledge, expertise or funds\(^5\). However, in this approach the community does not actively participate in decision making about the project. The instrumental approach is aligned with the strategic direction of a health sector organisation, and a partnership is formed to either achieve a particular health outcome or prevent a particular disease. The project is designed according to priorities identified by the health sector and engagement with the community aims to rally community support and endorsement of the project\(^5\). The aim of the empowerment approach is to establish a partnership through which the community and its members gain knowledge and the ability to take control over health issues affecting both individuals within the community and the community as a whole. Information, knowledge and power is explicitly transferred from health professionals to community members. The partnership formed in the developmental approach aims to improve specific and broad health outcomes and also address the social determinants of health relevant to the particular community\(^5\).

Potvin, Cargo, McComber, Delormier and Macaulay describe the positive effect that community participation has on the promotion of social justice and equity in healthcare, two principals that underlie public health\(^6\). They suggest that public health programs should be based on community participation and state that there is a growing evidence to suggest that community based public health interventions can reduce health inequities and promote social justice. These authors cite a successful community partnership program in the Kahnawake Schools Diabetes Prevention Project in Canada\(^6\). A study conducted by GPs in this community showed high rates of type II diabetes and associated complications, as well as high rates of obesity in adults. When the community was provided with this information, they (the community) asked for a diabetes prevention plan to be developed by local GPs. At the community’s request the prevention plan was focussed on young children within the community. The goals of the intervention were to reduce the rates of type II diabetes in the via healthy eating and increased physical exercise and also to “promote community capacity building and programme ownership, while respecting the Mohawk traditions and culture”\(^6\). This program was a participatory project that involved collaboration of the Kanien'kehaka community of Kahnawake, community based researchers and academic researchers. The four principles underlying this project were: community members were included as equals in the project, consistent evaluation of the intervention, flexibility in the program and the use of the project as a learning tool\(^6\).
Community participation and partnership building in chronic disease management was also trialled in rural South Australia through client centred care planning\(^7\). Whilst there were issues apparent in this model of care related to the sustainability of care planning associated with current funding arrangements in Medicare, care planning when linked to community based and peer-led self management courses has potential positive outcomes for long term chronic disease management. Evidence suggests that peer-led groups are associated with peer learning and modelling, effective and joint problem solving and increased self confidence in participants\(^6\). Given that that estimates from 2002 attributed 80 per cent of the Australia’s disease burden to be related to chronic diseases and the increasing incidence of chronic diseases in our country, care planning and peer-led self management may provide suitable options for more effective long term management of such conditions\(^6\).

Couzos, Lea, Murray and Culbong highlight the effectiveness of community participation and community control of interventions in the National Aboriginal Community Controlled Health Organisation (NACCHO) Ear Trial\(^8\). The community based multi-centred double blinded randomised controlled trial was controlled by the NACCHO from the outset. Couzos, Lea, Murray and Culbong assert that it was this very community ownership that negated and overcame conflicts related to study design, data ownership and funding\(^8\). Major benefits of this trial were the demonstration of the high scientific standards capable through community research partnerships, the respect shown throughout the research for the participants involved in the trial, empowerment of the Australian Indigenous community and potential for such research to direct resources to underserved populations: “The sense of pride emanating from Aboriginal community-controlled research led by the late Dr Puggy Hunter, former Chair of NACCHO and the national Human Rights Medal recipient for 2001 (as instigator of this study in 1998) to comment that ‘we are not just participants, we are in charge’”\(^8\).

The New Zealand initiative, the Canterbury Health in All Polices Partnership (CHIAPP) also showcases the effectiveness of partnerships and community collaboration. CHIAPP was established in 2009 and was originally known as the Canterbury Health Impact Assessment Partnership Project\(^9\). The aim of the initial project was to build capacity for the four partner organisations [Community and Public Health (a Division of the Canterbury District Health Board), Christchurch City Council, Environment Canterbury and a primary health organisation called Partnership Health Canterbury] to undertake health impact assessments. This initial project evolved into the Canterbury Health in All Policies Partnership in 2011. The main goal of the Health in All Policies program is to use health impact assessments to achieve better health outcomes for everyone. This program provides ongoing education and consideration of the determinants of health. As a result there is a reorientation of services which will ultimately benefit the whole community of Canterbury\(^9\).

The World Health Organisation also emphasises the importance of involving “street-level” policy implementers (namely community healthcare providers and managers) in planning health systems as a vital component of health system strengthening\(^8\). These authors propose that the first step in health sector intervention design with a systems thinking focus is to convene stakeholders from across the health system, including healthcare providers and managers, users of the health system, selected implementers and researchers and that this will improve the likelihood of successful implementation.
Review conclusion

As demonstrated in this review, health workforce issues are complex and multifaceted with no one clear correct approach or one size fits all option available. Health workforce planning needs to consider supply side and demand side issues and have a sound understanding of the current workforce\(^\text{34}\). Furthermore sophisticated and dynamic modelling tools are required for effective health workforce planning that can account for and simulate the affects of uncertainty and changes in the healthcare system\(^\text{40}\). Within such planning, terms and parameters need to specifically and accurately defined. For example, as identified by Segal and Bolton when health demand is used in workforce planning, there often is a failure to differentiate between expressed workforce demand and underlying need\(^\text{34}\). Adding further complexity to the area of workforce planning are rural and regional health workforce issues. In rural and regional areas globally and in Australia, supply side factors and workforce shortages have been consistently reported. The shortages are intrinsically related to a general maldistribution of the health workforce with the majority of health professionals preferring to work in urban areas, whilst half of the population worldwide live in rural areas\(^\text{49}\). In order to address issues in rural and regional areas, health workforce planning needs to include strategies that incorporate effective recruitment and retention of health professionals to these areas.

As each region and community has unique needs, a sound knowledge of the community is required to assist in effective health workforce planning. Community needs assessments that systematically identify health needs of a community at a specific time could provide valuable information in workforce and service planning in a particular area. A clear benefit of a community health needs assessment within a primary healthcare setting is that such an assessment prioritises the provision of services in an equitable and just way to those who require it the most\(^\text{3}\). Furthermore, utilisation of the process of community participation and partnership building will add to existing knowledge of the community and also enhance community support and utilisation of health services. The JCU ‘Regional workforce planning in north Queensland: starting with the end in mind’ project aims to establish such a workforce, one that is sustainable, equitable and meets the needs of the region bounded by Cairns regional centre, Mareeba and Yarrabah. This work will contribute to the evidence base for future and effective health workforce planning in Australia and will ultimately be part of the global effort in providing healthcare to all people.
Appendix D

Project team

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Co-investigators:

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Additional team members

Ms Jane Hollins, Research officer, Mareeba background report and Mr David Baird, Research officer, Yarrabah background report. Ms Paula Match, JCU Medical Student and Research Worker. Natalie Dallow, Research and Evaluation officer and Sonya Van Bremen, JCU School of Medicine manager
Appendix E

List of Stakeholders

Byrnes St Medical Practice
Cairns and Hinterland Hospital and Health Service, Queensland Health
Cairns Base Hospital, Queensland Health
Gurriny Yealamucka Health Service
Mareeba Clinic
Mareeba Council
Mareeba Hospital, Queensland Health
Mulungu Aboriginal Corporation Medical Centre
Queensland Aboriginal and Islander Health Council
Queensland Health
Tablelands Health Service, Queensland Health
Tablelands Regional Council
Yarrabah Hospital
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