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The Integrated Chronic Care Atlas of Dubbo and Coonamble

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Abbreviations

Abbreviation	Definition
ACCHS	Aboriginal Community Control Health Service
ACI	Agency for Clinical Innovation
AHW	Aboriginal Health Worker
AIHW	Australian Institute of Health and Welfare
AMS	Aboriginal Medical Service
AOD	Alcohol and Other Drugs
ASR	Age Standardised Rate
ATSI	Aboriginal and Torres Strait Islander
BSIC	Basic Stable Input of Care
CDMP	Chronic Disease Management Program
COPD	Chronic Obstructive Pulmonary Disease
CHD	Coronary Heart Disease
CVD	Cardiovascular Disease
DCP	Diabetes Care Project
DESDE	Description and Evaluation of Services and Directories in Europe
DESDE-LTC	Description and Evaluation of Services and Directories in Europe for Long-Term Care
DoH	Department of Health
ERP	Estimated Residential Population
FTE	Full Time Equivalent
GIS	Geographical Information System
GP	General Practitioner
ICF	International Classification Functioning
IHD	Ischaemic Heart Disease
IHSS	Indigenous Health Support Service
IRSD	Index of Relative Socio-economic Disadvantage
LGA	Local Government Area
LTC	Long Term Care
MBS	Medical Benefits Scheme
MHNIP	Mental Health Nurse Incentive Program

MOICDP	Medical Outreach Indigenous Chronic Disease Program
MTC	Main Type of Care
NDIS	National Disability Insurance Scheme
NGO	Non-Government Organisation (or community service provider)
NMHC	National Medical Health Council
NSW	New South Wales
PHIDU	Public Health Information and Development Unit
PHN	Primary Health Network
PPH	Potentially Preventable Hospitalisations
RFDS	Royal Flying Doctor Service
SA3	Statistical Area-Level 3
SEIFA	Socio Economic Indexes for Areas
WHO	World Health Organisation
WNSW LHD	Western NSW Local Health District
WNSW PHN	Western NSW Primary Health Network

Definitions

Term	Definition
Cardiovascular Disease	The term cardiovascular disease is used to describe many different conditions affecting the heart and blood vessels. The most common and serious types of CVD in Australia are coronary heart disease (CHD), stroke and heart failure (AIHW, 2017a).
Chronic Obstructive Pulmonary Disease	Chronic obstructive pulmonary disease (COPD) is a serious, progressive and disabling condition that limits airflow in the lungs. It includes emphysema and chronic bronchitis. People with COPD are often short of breath and may have frequent coughing (AIHW, 2017b).
Chronic Bronchitis	Bronchitis is the inflammation of the larger airways in your lungs, causing an ongoing cough. Bronchitis can be due to an infection, smoking or breathing in irritating substances (DoH, 2017a).
Coronary Heart Disease	Coronary heart disease (CHD) occurs when there is a blockage in the blood vessels that supply blood to the heart muscle. There are two major clinical forms: heart attack—an acute life-threatening event when the blood vessel supplying the heart itself is suddenly completely blocked, threatening to damage the heart muscle and its function, requiring prompt treatment, and angina—a chronic condition in which short episodes of chest pain can occur periodically when the heart has a temporary deficiency in its blood supply (AIHW, 2016).
Emphysema	Emphysema is a condition that causes shortness of breath and cough. The major cause of emphysema is smoking. However, some people who have never smoked get emphysema because of a genetic condition. In people who have emphysema, the air sacs, or alveoli, of the lungs are damaged. This causes the small airways to collapse when air is breathed out, which makes it hard for air to flow into the lungs and even harder for it to flow out (DoH, 2017b).
Type 1 Diabetes	Type 1 diabetes is an unpreventable autoimmune disease that develops when the immune system destroys the insulin-producing cells of the pancreas (AIHW, 2017c).
Type 2 Diabetes	Type 2 diabetes is the most common form of diabetes, and is largely preventable by maintaining a healthy lifestyle. It occurs when the body becomes resistant to the insulin being produced by the pancreas and/or the amount produced is inadequate to meet the body's needs (AIHW, 2017c).

Executive Summary

Chronic disease affects approximately seven million people in Australia, is a major contributor to morbidity and premature mortality and represents a disproportionately large economic cost to the health system.

The three chronic disease foci of this report, Chronic Obstructive Pulmonary Disease (COPD), Cardiovascular Disease (CVD) and Diabetes Mellitus, form significant economic, social and health costs in Australia. COPD affects the daily lives of approximately 2.1 million people, CVD accounts for approximately 12% of all health care costs across Australia and Diabetes Mellitus affects approximately 1 million Australians.

The Western New South Wales Primary Health Network (WNSW PHN) region has recorded higher proportions of circulatory, respiratory and endocrine related diseases when compared with NSW and national data and chronic disease is one of the nine priority areas identified by the PHN in its needs assessment.

Multi-morbidity of chronic disease is common and rates of preventable hospitalisations remain high, strengthening the push for a more integrated, multi-disciplinary approaches to service provision and management. The planning and development of new models and approaches relies on a sound knowledge of what services are currently available. Further, an in-depth understanding of the local context is crucial to the implementation of any new strategy and local context and relevance shapes the lens through which policy makers appraise the salience of evidence (Oliver et al, 2014).

The creation of this Integrated Atlas of Chronic Care for Dubbo and Coonamble provides this understanding. The Atlas uses a standard classification system, the “Description and Evaluation of Services and Directories in Europe for Long-Term Care” model (DESDE-LTC), to describe and classify chronic care services.

The Atlas is a pilot project that takes the Description and Evaluation of Services and Directories in Europe (DESDE) methodology and tests its application to the provision of chronic care for the first time. By utilising this internationally recognised and evidence-based tool as its supporting methodology, it is possible to derive benchmarks and comparisons with other regions and other types of care both within Australia and internationally, including remote and rural areas of Country Western Australia. Integrated Atlases allow policy planners and decision makers to understand the landscape in which they work, including areas of service gaps or over-supply. This provides a sound basis for long-term service planning and development and significantly advances efforts towards integrated care and achieving improved outcomes for all service users.

Dubbo is a major regional town located in the WNSW PHN and the Western New South Wales Local Health District (WNSW LHD) region. It sits close to the eastern border of the PHN, bordered to the west by Narromine, Gilgandra and Parkes, and to the South by the towns of Orange and Bathurst. Coonamble sits further north of Dubbo, with a greater land area, but a relatively smaller population.

The population of Dubbo is 41,934 of which 56% are adults, 30% children and 14% older adults. It covers an area of 3,426 square kilometres and has a population density of 12.24 people per km^2. Coonamble has a population of 4,262 across a similar spread of ages. It covers an area of 9,916 square kilometres and as such has a smaller population density of 0.43 residents per square kilometres. This compares with a rate of 0.70 for the WNSW PHN region. Dubbo and Coonamble especially, have above average rates of hospitalisation and premature mortality due to chronic disease, particularly in relation to COPD.

Data collection for this Atlas took place in May and June of 2017.

The Atlas has identified some key characteristics in the provision of chronic care in the towns of Dubbo and Coonamble:

- Consistent with patterns of care provided in other rural and remote locations (e.g. Country Western Australia), there is a high number of Non-Acute Non-Mobile Outpatient services, but these are small or very small in capacity.
- There are relatively more chronic disease services (or 'teams') than mental health 'teams' per 100,000 population (139.21 vs. 89.45).
- There are no specialised inpatient beds or wards for treating specific chronic diseases in either Dubbo or Coonamble (e.g. coronary care units for example).
- There are no age-specific chronic disease services, rather services are generally open age.
- Chronic disease service provision is almost entirely clinical, delivered by the public health sector or private health providers.
- Team sizes are extremely small, often less than one Full-Time Equivalent (FTE) and often run on set days or for blocks of hours rather than every day.
- Services are hub and spoke in many cases, with the service based elsewhere or provided by a 'visiting' clinician.

The Atlas reveals the DESDE Methodology can be effectively applied to map chronic care services to facilitate a deeper understanding of the unique characteristics and the pattern of chronic care in a given area.

It is expected that the Integrated Chronic Care Atlas for Dubbo and Coonamble will support the further advancement of the DESDE methodology across the provision of chronic care, facilitating a systems approach to planning and, consequentially, improve the provision of care through facilitating the integration and coordination of services, both in terms of service commissioning and delivery. Ultimately this will be reflected in the quality of care provided and in the longer term, and better health outcomes for people with a chronic disease.

1. Introduction

Chronic disease, including type 2 diabetes, coronary heart disease, COPD and depression, affects approximately seven million people in Australia (AIHW, 2014). Chronic diseases are major contributors to morbidity and premature mortality (NSW Agency for Clinical Innovation, 2013) and represent a disproportionately large economic cost to the health system. For example, in 2008-09 $7.74 billion alone was spent on cardiovascular disease (Schofield et al, 2016; Willcox, 2014). Chronic diseases are 'long lasting, and have persistent effects' (AIHW, 2014, p. 1), with significant impacts on quality of life.

The three chronic disease foci of this report, Chronic Obstructive Pulmonary Disease (COPD), Cardiovascular Disease (CVD) and Diabetes Mellitus, form significant economic, social and health costs in Australia. In Australia, COPD affects the daily lives of approximately 2.1 million people, of which 57% are women (Lung Foundation, 2017). This burden of disease cost the health system and Australia's productivity $8.8 billion dollars in 2008 alone. Diabetes Mellitus, which encompasses both Type 1 and Type 2 Diabetes, affects approximately 1 million Australians, increases in prevalence with age and is more prevalent in men than women (Diabetes Australia, 2012). Of concern, Indigenous Australian's are three times more likely to be living with Type 2 Diabetes than non-Indigenous Australians (Diabetes Australia, 2012). Type 2 Diabetes costs the healthcare system in Australia $6 billion per annum, whilst Type 1 Diabetes costs the Australian health system $580 million per year. The disease accounts for 10% of all hospitalisations across the country (AIHW, 2016a).

However, CVD has the greatest impact upon Australia's health care system, with an estimated 12% of all health care costs supporting CVD related care (AIHW, 2014). The prevalence of CVD increases with age, and is a significant burden on hospitalisation rates (AIHW, 2014). In 2014/2015, approximately 22% of adults, or 4.2 million Australians self-reported having CVD (AIHW, 2016b). CVD is the major cause of mortality for both men and women in Australia, claiming 43,602 lives in 2013 (Nichols et al, 2016). This condition is a major cause of acute myocardial infarction (heart attack), of which Aboriginal and Torres Strait Islander populations are two and a half times more at risk than non-Indigenous populations (Nichols et al, 2016). Risk of CVD is 30% higher in remote and very remote areas of Australia (AIHW, 2016).

Potentially preventable hospitalisations represent a significant proportion of health expenditure for chronic disease in Australia, and are key performance 'indicators of accessibility effectiveness in the Australian National Healthcare Agreement' (Falster and Jorm, 2017, p. 3). Early intervention and management of chronic diseases such as COPD, CVD, Diabetes and mental illness can effectively prevent hospitalisations and decrease burden on the tertiary care system. For Aboriginal and Torres Strait Islander populations, potentially preventable hospitalisations are 3.2 times more likely than in non-Indigenous populations, and rates increase with greater remoteness (Australian Health Ministers' Advisory Council, 2017).

Mental Illness and other Chronic Diseases

Multi-morbidity of chronic disease is not uncommon, contributing significantly to decreased quality of life and increased demand for an integrated care system (Tyack et al, 2016). There is a strong, well established link between mental illness and chronic diseases addressed in this report. The link between severe mental illness and poor physical health is undeniable. Depression, for example, has been established as a risk factor for heart disease, stroke and diabetes mellitus (Clarke and Currie, 2009). The lifespan of people with severe mental illness is significantly shorter when compared to the general population with international studies showing that people with severe mental illness have a mortality rate two to three times as high as the general population (De Hert et al, 2011). This translates to a 13-30 year shortened life expectancy, approximately 60% of this excess mortality is due to physical illness, including chronic diseases such as diabetes, obesity, metabolic syndrome and CVD. Australian studies

confirm this, with research showing that people with a primary diagnosis of schizophrenia have an average life expectancy that is 16.4 years less than average for Australian men and 12.5 years less than average for Australian women (AHPC, 2016). Furthermore, people with serious mental illness are more likely to die from almost all chronic conditions. They are two to three times more likely to have diabetes and six times more likely to die from CVD at younger ages.

The costs of co-morbidities associated with premature death in those with serious mental illness have been estimated to be approximately $15 billion in Australia, or 0.9% of GDP.

The Challenges of Multi-morbidity

The incidences of multi-morbidity of chronic illness and mental illness presents challenges for a health system geared toward treating single illness cases. In 2010, Dawes called for guidelines for treatment regarding each patient, rather than guidelines for each disease, reflecting the growing complexity and frequency of co-morbid chronic illness. In Australia, it is likely that those suffering from multi-morbid chronic disease are seeing multiple healthcare providers, and are receiving multiple healthcare treatments and medications (Mossialos et al, 2015). Understanding the balance of care provision within a community is essential in service delivery and planning, particularly when one patient may be calling upon the support of multiple and sometimes disconnected health services.

From the patient perspective, integrated care that is responsive to an individual's complex needs is vital and can significantly affect the experience of a patient. In an Australian study on COPD patient perceptions of integrated care, researchers found that,

> *"patients were confused about provider roles, had little understanding of their disease, had difficulty accessing services and did not have COPD action plans" (Kirby et al, 2014, p. 158).*

On the service side, there is an apparent lack of integration between hospital and community services (Kirby et al, 2014). In rural NSW, the 'complexity of provision of services and patients' limited awareness of different services' (Longman et al, 2011, p. 265) are key access barriers to chronic disease health care. Barriers to primary health care often result in potentially preventable hospitalisations, placing strain on emergency departments and increasing health care costs in the tertiary care system (Ansari et al, 2000; Katterl et al, 2012). Health planners and patients are often required to navigate an overly complex health system.

An integrated atlas of health services aims to be one mechanism, amongst others, to plan and develop an integrated and balanced system of care for chronic disease in any given community or geographic area, and work toward a health system that is easily accessible and integrated.

1.1 Chronic Disease in Rural Communities

Chronic disease and associated premature mortality is often more prevalent in rural and remote geographies compared to metropolitan cities (Kinsman et al, 2017). In a recent systematic review comparing rural and metropolitan locations conducted on Ischemic Heart Disease (IHD) and related health outcomes,17 out of 20 studies identified disparities in IHD outcomes when comparing major cities to regional and remote areas (Alston et al, 2017).

Treatment and management of chronic disease in regional, rural and remote localities across Australia can be viewed as a coalescence of many causes including:

- poorer access to multi-disciplinary and allied health services (Teng et al, 2014)
- reduced focus on preventative measures for at-risk populations (Allenby et al, 2015)
- pervasive health culture of self-reliance (Page-Carruth et al, 2014)

- challenges in attracting a workforce (Brownie et al, 2014), and
- the economic costs associated with travelling to and receiving healthcare (Bailie et al, 2015).

Prevention is one key area of improvement for chronic disease primary health care in rural locations. Allenby and colleagues (2015) found that the recording of risk factors for those at high risk of CVD was lower when compared to patients who are diagnosed with CVD. Importantly, rural and regional practices which had a higher Full Time Equivalent (FTE) of General Practitioners (GPs) and Nurse Practitioners and were engaged in professional development activities, were more likely to be supporting preventative action (Allenby et al, 2015).

In rural Western Australia, the disparity in health outcomes when compared with metropolitan populations is stark. In a study of over 17,000 heart failure patients across WA it was observed that those from rural areas at the time of first hospitalisation were significantly younger than their metropolitan counterparts (Teng et al, 2014). After adjusting for age, rural residents had a higher probability of death within 30 days of heart failure and a higher chance of death within 1 year in 30 day survivors (Teng et al, 2014).

Lack of access to healthcare that provides preventative, multi-disciplinary care has been found to lead to internalisation of self-reliance in rural areas of Australia. In a sample of rural Queensland Type 2 Diabetes patients it was found that:

> *"the discourse of self-reliance had become the rationalization for a lack of service provision to a point where participants did not demand preventative or chronic care services but rather focused on the availability of emergency assistance" (Page-Carruth et al, 2014, p. 5).*

The reliance on an emergency system and acute response healthcare is deleterious for both the demand and service sides of a health system. This places pressure on emergency departments, but also reduces quality of life for those experiencing chronic illness. Rather than having chronic illness appropriately managed, it becomes an experience pushed to the background that is only responded to when it becomes a crisis.

1.2 Chronic Disease in the WNSW PHN Region

The WNSW PHN region is characterised by high density regional towns such as Dubbo, Orange and Bathurst, located alongside more rural, less densely populated areas fanning out inland. Given this wide geographic area, there are also wide variations in population across the region. It is comprised of two Local Health Districts (LHDs); the Far West LHD and the Western NSW LHD. Broken Hill, in the far west of the state, is the largest town within the Far West LHD. Dubbo and Coonamble are both situated within the WNSW LHD.

Chronic Disease in Remote WNSW PHN

In rural and remote NSW, the Royal Flying Doctor Service (RFDS) operates out of Broken Hill, providing a combination of primary care clinics, remote telephone consultation, acute medical and emergency response and most notably, emergency medical evacuations via aeroplane (Garne et al, 2009). A problem identified by Garne and colleagues (2009) in a patient audit between 2000 and 2005 was that frequent evacuation patients were grappling with considerable chronic health conditions, however, by the nature of their remoteness, were not able to access appropriate specialist care for these conditions. The need for access to multidisciplinary teams for these individuals was high, but access to such services was generally low. The authors suggested that the proactive targeting of high risk patients to provide integrated and multidisciplinary care assessment and review was essential in the evolution of primary care services provided by the RFDS into the future (Garne et al, 2009). The

integrated management of chronic disease in rural areas is currently being evaluated for effects on frequency of acute health response evacuations (Moore & Kirby, 2015).

Chronic Disease Hospitalisations in Dubbo and Coonamble

In more populated hubs, the impact of chronic disease is reflected in the hospital admissions data. At Dubbo Base Hospital, unplanned readmissions were the focus of a ten-year time-series study between 1996 and 2005 and identified that unplanned hospital readmissions had increased from 4.7% to 5.4% as a proportion of total hospital admissions (McLean et al, 2008). Importantly, of the top 15 diagnoses associated with unplanned readmissions, COPD was the highest contributor (3.8%). Other chronic health diagnoses associated with unplanned readmission included heart failure (2.2%), Angina Pectoris (2.1%) and Type 2 Diabetes (1.1%). For unplanned readmissions within seven days, COPD remained a significant contributor (3.2%), behind complications associated with non-classified procedures (6.3%) (McLean et al, 2008).

Reducing the reliance on acute care systems for the treatment of chronic disease requires an integrated, multidisciplinary approach to service provision and self-management. Innovative models of care can bring together the clinician and the individual to plan and manage chronic disease, preventing hospital admissions, promote medication compliance and improve service provision (Burmeister et al, 2016). In NSW, guidelines of care for chronic disease are facilitated through the Chronic Disease Management Plan.

1.3 Guidelines of Care for Chronic Illness

For diabetes care and other chronic conditions, the preferred model is generally regarded as:

> *"General practitioners and their practice nurses carrying out health assessments and monitoring, and the engagement of a multi-disciplinary team to work with the patient to set mutually acceptable and achievable health goals" (Webster et al, 2017, p.27).*

The Chronic Disease Management Program (CDMP) developed primarily by the Agency for Clinical Innovation (ACI) in NSW, provides guidance for the management of those at a high risk of hospitalisation and those individuals at very high risk of hospitalisation who require intensive care coordination (ACI, 2013). The CDMP is underpinned by five key principles (Table 1).

TABLE 1 KEY PRINCIPLES OF THE CDMP

Principle	Definition
1	Support the provision of coordinated, person-centred care that is empowering, respectful and appropriate.
2	Enable the primary care sector to manage and support people with chronic disease as close to home as possible, ideally through a 'medical home' model. Hospital admissions related to chronic disease are often preventable if comprehensive care is provided in the community.
3	Work in partnership to provide comprehensive and holistic care. The CDMP encourages a model of local shared governance with representation from LHDs, PHNs, GPs, Aboriginal Medical Services (AMSs), chronic disease services and with input from Non Government Organisations (NGOs) and other community-based services.
4	Implement evidence-based and evidence-informed care coordination and self-management support.
5	Address health inequities especially for populations known to be at higher risk of hospitalisation including Aboriginal people, frail elderly people, people living in rural and remote locations, people from culturally and linguistically diverse backgrounds and people of low socio-economic status.

The implementation of these principles is not without challenges. For example, in a report on the delivery of chronic disease self-management support and education in NSW, it was observed that self-management strategies that were viewed as important by primary healthcare workers were not always effectively implemented in practice. It was argued that more support was required for assessment and targeted education for primary health workers, particularly in training and mentoring of health staff to work toward a unified commitment to best practice principles (Cope, 2011).

Further afield, alternative care models have been trialled in recent years. A prime example is the Diabetes Care Project (DCP), comprising several randomised controlled trials across Queensland, Victoria and South Australia (Leach et al, 2013). There were five key changes to existing care models evaluated in the DCP, including:

- an integrated information technology platform
- continuous quality improvement processes
- flexible funding based on the level of risk associated with a patient
- quality improvement support payments, and
- funding for care facilitators (Australian Department of Health, 2015).

Whilst the program showed positive outcomes for those in the experimental groups when compared with control groups (Fountaine & Bennett, 2016), there were claims that the program was more expensive than the existing Medical Benefits Scheme (MBS) care model (Woodhead, 2015). However, those in the experimental groups showed significant improvements in key metrics such as blood pressure, blood lipids and waist circumference, as well as indicators for depression, diabetes-related stress and care plan take-up (Fountaine & Bennett, 2016). On the practitioner side, health workers were more likely to use the specially developed information technology system (Fountaine & Bennett, 2016). Moving forward, the Government has outlined an intention to fund a further review of a similar model of care reform package, the Health Care Homes Initiative (Morrison & Cormann, 2016).

Health Care Homes

As mentioned earlier, the coexistence of multiple diseases across mental and physical domains creates the necessity for highly integrated multi-disciplinary health teams. These teams must treat the individual and their complex health requirements, rather than a single disease. In the Better Outcomes for People with Chronic and Complex Health Conditions report the complexity and requirement for integrated care was placed front and centre of the chronic disease policy formation (Primary Health Care Advisory Group, 2016). It was recognised that services providing care for those with complex needs were fragmented with poorly defined links to secondary care services resulting in difficultly for patients to engage in their own care planning.

The report advanced a reform agenda that formalised the engagement between patients with chronic and complex conditions and the Health Care Home model of care. The model takes a setting based approach so that patents can receive enhanced access to both coordinated care as well as critical wrap-around support structures (Table 2).

TABLE 2 FEATURES OF THE HEALTH CARE HOME

Feature	Description
Voluntary patient enrolment	Practice or health care provider to provide a clinical 'home-base' for the coordination, management and ongoing support for their care.
Patients, families and their carers as partners in their care	Patients are activated to maximise their knowledge, skills and confidence to manage their health, aided by technology and with the support of a health care team.
Patients have enhanced access	Access to care provided by their Health Care Home in-hours, which may include support by telephone, email or videoconferencing and effective access to after-hours advice or care.
Patients nominate a preferred clinician	The nominated clinician is aware of their problems, priorities and wishes, and is responsible for their care coordination.
Flexible service delivery and team based care	Care that supports integrated patient care across the continuum of the health system through shared information and care planning.
A commitment to care which is of high quality and is safe	Care planning and clinical decisions are guided by evidence-based patient health care pathways, appropriate to the patient's needs .
Data collection and sharing	By patients and their health care teams to measure patient health outcomes and improve performance.

Funding and Chronic Care Planning in WNSW

WNSW PHN is not currently a candidate PHN for the Health Care Home model implementation and evaluation. However, there are significant innovative efforts being undertaken by the WNSW PHN to mirror Health Care Home principles and fund innovative initiatives and service providers to deliver chronic care in the region. Supporting this innovation is a model of high performing primary care developed by Bodenheimer, Ghorob, Willard-Grace and Grumbach (2014).

The model is underpinned by four foundational principles, including:

- Engaged leadership - Leadership at all levels (including consumers) engaged in the change process
- Data driven improvement - Data systems to track clinical outcomes, consumer experience and service performance
- Empanelment - Linking of each consumer to a panel of care providers and a primary care clinician, and
- Team based care - Teams consisting of clinical and non-clinical staff providing primary care to a consumer.

The WNSW LHD is a LHD demonstrator as part of the NSW Government's Integrated Care Strategy, which has provided funding for LHDs to develop and demonstrate innovative models of care in their respective areas. Furthermore, the WNSW PHN is in the process of commissioning chronic disease management and care services built upon the principles of Health Care Homes and service innovation. These services will be primarily located in GPs and are to begin July 1, 2017 (WNSW PHN, 2017).

1.4 Why an Integrated Atlas?

Models of care cannot stand alone as effective tools for the management and minimisation of chronic diseases in any given area. A sound knowledge of which services are currently available within any given catchment is necessary in planning, commissioning and coordinating chronic care. Furthermore,

pinpointing the core activities of specific services on the ground can assist with integrating service provision. This Integrated Atlas of Chronic Care for Dubbo and Coonamble aims to provide this detailed service provision understanding.

By employing a robust methodology to classify and map services across a specific geographic region, policy makers, service planners and commissioning bodies can be informed and aware of current service provision being delivered geospatially in relation to key sociodemographic factors. Furthermore, the consistent classification system employed by the atlas methodology allows for later comparison of service provision with other regions. The utility of a validated, comparable and transferable classification system goes beyond simply listing services in a directory, toward being able to understand the functional service delivery teams working in a region, where there may be gaps in service provision and where the greatest need for care may be.

This atlas project sets out to answer the following research questions:

- What specialised care is available for Diabetes, COPD and CVD in Dubbo and Coonamble?
- How are these services spatially located within Dubbo and Coonamble in relation to key socio-demographic variables?
- What is the workforce capacity behind the delivery of specialised chronic disease care in Dubbo and Coonamble?

2. What are Integrated Atlases?

2.1 Mental health

The World Health Organisation (WHO) Mental Health Gap Action Program (mhGAP) has highlighted the need for a comprehensive and systematic description of all the mental health resources available and the utilisation of these resources (WHO, 2008). It is not only important to know the numbers of services in each health area, but also to describe what they are doing and where they are located. This information also enables an understanding of the context of health-related interventions that are essential for the development of evidence-informed policy (Health Foundation, 2014).

This is further supported by one of the key recommendations made by the National Review of Mental Health Programmes and Services by the National Mental Health Commission (NMHC, 2014), being the need for comprehensive mapping of mental health services.

The National Review draws attention to local level of mental health planning in Australia and the relevance of a bottom-up approach to understanding local service availability and the relationship to the development of national policy. It also calls for responsiveness to the diverse local needs of different communities across Australia, stating that:

> *"Mental Health Networks, in partnership with Local Health Networks, should conduct comprehensive mapping of mental health services, programmes and supports available in regional, rural and remote areas through Commonwealth, state and territory and local governments, private and not-for-profit sectors." (NMHC, 2014, p.84)*

2.2 Chronic Care

The need for mapping of services, however, is not restricted to those in the mental health space. Understanding the landscape regarding chronic care service delivery is equally important for service planning and meeting the needs of the community, based on their unique characteristics and health care requirements.

The 'integrated care model' has challenged the way health-related care should be assessed and planned (Goodwin, 2013). It enables us to identify new routes for linked, consumer-centred approaches to care. Greater integration relies on a global picture of all the services available, regardless of which sector is funding them (i.e. Health, Social Welfare and Family, Employment, Criminal Justice). Such 'systems thinking' enables policy planners to capture the complexity of service provision holistically and ensures that planning of health services accounts for contextual factors that might affect its implementation and sustainability (context analysis). It offers a comprehensive way of anticipating synergies and mitigating problems and barriers, with direct relevance for creating policies that integrate the different systems of care (De Savigny & Adam, 2009; Aslanyan et al, 2010). This is particularly important in the social and disability care sector, which is characterised by increasing personalisation of services and care coordination programs such as Partners in Recovery (PIR) and the transfer of social services to the National Disability Insurance Scheme (NDIS). However, there are only a handful of locations across Australia identified that systematically develop an innovative, system wide and sustainable service model for providing coordinated and integrated care services (NSW Health, 2014).

Such integrated and coordinated care is increasingly important in the prevention, management and treatment of chronic conditions. Not only are there clear benefits for the individual, but collectively there is opportunity to reduce health care system costs, reduce chronic disease related hospitalisations and reduce premature mortality in those with chronic disease multimorbidity (Huber, Reich & Fruh, 2016; Rose et al, 2017).

The evidence between social determinants of health and chronic disease has also grown in recent years (Cockerham et al, 2017). Income, social capital, educational attainment and the level of social inequality can all contribute to increased incidence of chronic disease in a community (Cockerham et al, 2017; Oates et al, 2017; Mendenhall et al, 2017). The social determinants of health are similarly implicated in other health related behaviours such as excessive alcohol consumption and drug use (Marmot & Allen, 2014).

Within these broad social and service contexts, Integrated Atlases are powerful tools for service planning and decision-making, particularly in times of fiscal constraint. These documents include detailed information on social and demographic characteristics and health-related needs, as well as data on service availability and care capacity.

Whilst Atlases developed around the world to date have most often focused on mental health, the methodology and taxonomy can be applied to a range of health issues, including other chronic diseases such as Diabetes, CVD and COPD. Evidence of chronic disease service mapping is beginning to emerge, however the implementation of a standardised classification mapping system for chronic care is continuing to be developed and refined (Rachid et al, 2017).

Integrated Atlases utilising the DESDE methodology allow policy planners and decision makers to understand the landscape in which they work (including areas of under or over-supply), make bridges between the different sectors and better allocate resources. This is particularly important as chronic care services become more integrated and ‘person-centred’ (placing the person and their needs at the centre of their care) (Burton et al, 2017). In addition, the knowledge presented in the Atlases can support evidence and knowledge informed planning, decision-making and future service commissioning.

2.3 The Importance of Context

The most recent National Framework for Chronic Conditions depicts a holistic, integrated and person-centred chronic health care system that is focussed on prevention of chronic disease and timely and appropriate intervention when required (Australian Health Ministers' Advisory Council 2017) (Figure 1). When utilising this Atlas as a decision support tool for service planning and integration, this framework should be read and understood in concert with the Atlas. Of note are priority populations for chronic care including older persons, Aboriginal and Torres Strait Islander people, those living in rural and remote areas and those presenting with complex mental and physical comorbid conditions (Australian Health Ministers’ Advisory Council, 2017).

Evidence-informed policy combines ‘global evidence’ available from around the world with ‘local evidence’ from the specific setting in which decisions and actions will be taken. This includes a detailed analysis of the area, considering the prevalence of chronic disease and other demand driven indicators, together with the availability of resources (Oxman et al, 2009).

It is important however to highlight that evidence alone does not make decisions. An in-depth understanding of the local context is crucial to the implementation of any new strategy and local context and relevance shapes the lens through which policy makers appraise the salience of evidence (Oliver et al, 2014).

Evidence has to be valued and filtered by the policy makers and a lack of perceived relevance is a frequently cited barrier to the uptake of evidence by policy makers (Oliver et al, 2014). Evidence must also be supported and supplemented by the knowledge and experience of the people working within and those using the services, provided by the system.

It is expected that the Integrated Chronic Care Atlas of Dubbo and Coonamble will support a systems approach to planning and, consequentially, improve the provision of care through facilitating the integration and coordination of services, both in terms of service commissioning and delivery.

Ultimately, it is hoped that this will be reflected in the quality of care provided and in the longer term, better health outcomes for people with a chronic disease.

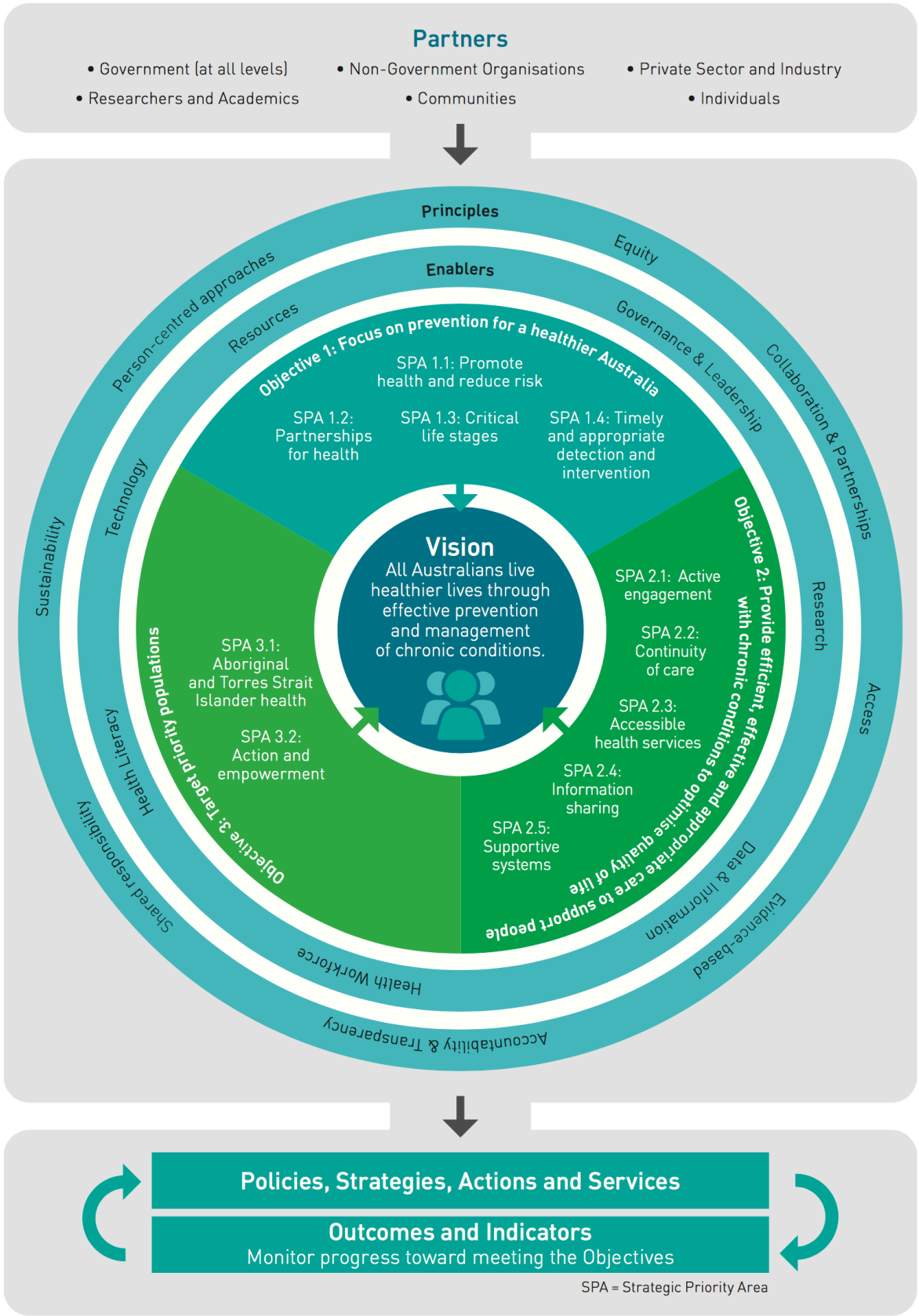


FIGURE 1 NATIONAL STRATEGIC FRAMEWORK FOR CHRONIC CONDITIONS

3. Framework

Typically, atlases of health are formed through lists or directories of services and the inclusion of services is based on their official or everyday titles. This is particularly problematic for several reasons including:

- The wide variability in the terminology of services and programs even, in the same geographical area, and the lack of relationship between the names of services and their actual functions (e.g. day hospitals, day clinic), as the service name may not reflect the actual activity performed in the setting; and,
- The lack of a common understanding of what a service is. The word 'service' is an umbrella term that is used to describe very different components of the organisation of care. It merges permanent, highly structured services, with clinical units, or even short-term programs and interventions (Salvador-Carulla et al, 2011).

3.1 DESDE-LTC

To overcome these limitations in this project the DESDE-LTC has been used which is an open-access, validated, international instrument for the standardised description and classification of services for long term care (Salvador-Carulla et al, 2013).

The DESDE-LTC includes a taxonomy tree and coding system that allows the classification of services in a defined catchment area according to the main care structure/activity offered, as well as the level of availability and utilisation. It is based on the activities, not the name of the service provider. The classification of services based on the actual activity of the service therefore reflects the real provision of care in a defined catchment area.

It is important to note that in research on health and social services there are typically different units of analysis and that the Integrated Atlas requires that comparisons must be made across a single and common 'unit of analysis' group. Different units of analysis include: Macro-organisations (e.g. Local Health Networks), Meso-organisations (e.g. hospitals), and Micro-organisations (e.g. services). It could also include smaller units within a service: Main Types of Care, Care Modalities, Care Units, Care Intervention Programs, Care Packages, Interventions, Activities, Micro Activities or Philosophy of Care.

Analysis based on DESDE-LTC is focused on the evaluation of the service delivery teams or Basic Stable Inputs of Care (BSIC).

3.2 Basic Stable Inputs of Care

A Basic Stable Input of Care (BSIC) is best described as a team of staff working together to provide care for a group of people, it could also be described as a service delivery team.

These teams must have time stability (typically they have been funded for more than three years or have funding secured for three years) and structural stability. Structural stability means that they have administrative support and two of the following:

- Their own space (which can be in a shared office)
- Their own finances (for instance a specific cost centre), and
- Their own forms of documentation (i.e. they collect data and produce reports on their service activities).

There are several criteria that help to define a BSIC (Table 3).

TABLE 3 BASIC STABLE INPUT OF CARE CRITERIA

Criterion		
A	Has its own professional staff	
B	All activities are used by the same clients	
C	Time continuity	
D	Organisational stability	
	D.1	The service is registered as an independent legal organisation (with its own company tax code or an official register) IF NOT:
	D.2	The service has its own administrative unit and/or secretary's office and fulfils two additional descriptors If NOT:
	D.3	The service fulfils three additional descriptors:
		D3.1 It has its own premises and not as part of other facility (e.g. a hospital)
		D3.2 It has separate financing and specific accountability (e.g. the unit has its own cost centre)
		D3.3 It has separated documentation when in a meso-organisation (e.g. end of year reports)

Classification of BSIC

Once BSIC are identified using the above criteria, the Main Types of Care (MTC) they provide are examined and classified.

Each BSIC is classified by using one or more codes based on the MTC they deliver. Some services might include a principal structure or activity (for example a 'Residential Care' code) and an additional one (for example, a 'Day Care' code).

There are six main classifications of care within the DESDE-LTC (Figure 2).

Residential Care - Used to classify facilities which provide beds overnight for clients for a purpose related to the clinical and social management of their health condition. These include Inpatient hospital wards, crisis shelters, Residential Rehabilitation services and Inpatient Withdrawal units. Residential Care is divided into Acute and Non-Acute branches (Figure 3).

Day Care - Used to classify facilities which: (i) are normally available to several clients at a time (rather than delivering services to individuals one at a time); (ii) provide some combination of treatment for problems related to long-term care needs (e.g. providing structured activities or social contact/and or support); (iii) have regular opening hours during which they are normally available; and (iv) expect clients to stay at the facility beyond the periods during which they have face to face contact with staff, these include the more traditional long-stay day programs (Figure 4).

Outpatient Care - Used to code care provided by service delivery teams which: (i) involve contact between staff and clients for some purpose related to the management of their condition and associated clinical and social needs; and (ii) are not provided as a part of delivery of residential or day services, these include outreach services (Figure 5). Quite often Outpatient Care also involves the provision of information and support to access other types of care.

Accessibility to Care - Classifies service delivery teams whose **main function** is to facilitate access to care for clients with long-term care needs. These services do not provide any therapeutic care and include Care Co-ordination services (Figure 6).

Information for Care - Used for service delivery teams whose **main function** is to provide clients with information and/or assessment of their needs. Services providing information are not involved in subsequent monitoring/follow-up or direct provision of care, these include many telephone information and triage type services (Figure 7).

Self-help and Voluntary Care - Used for BSIC which aim to provide clients with support, self-help or contact, with un-paid staff that offer any type of care as described above (i.e. Residential, Day, Outpatient, Accessibility or Information) (Figure 8).

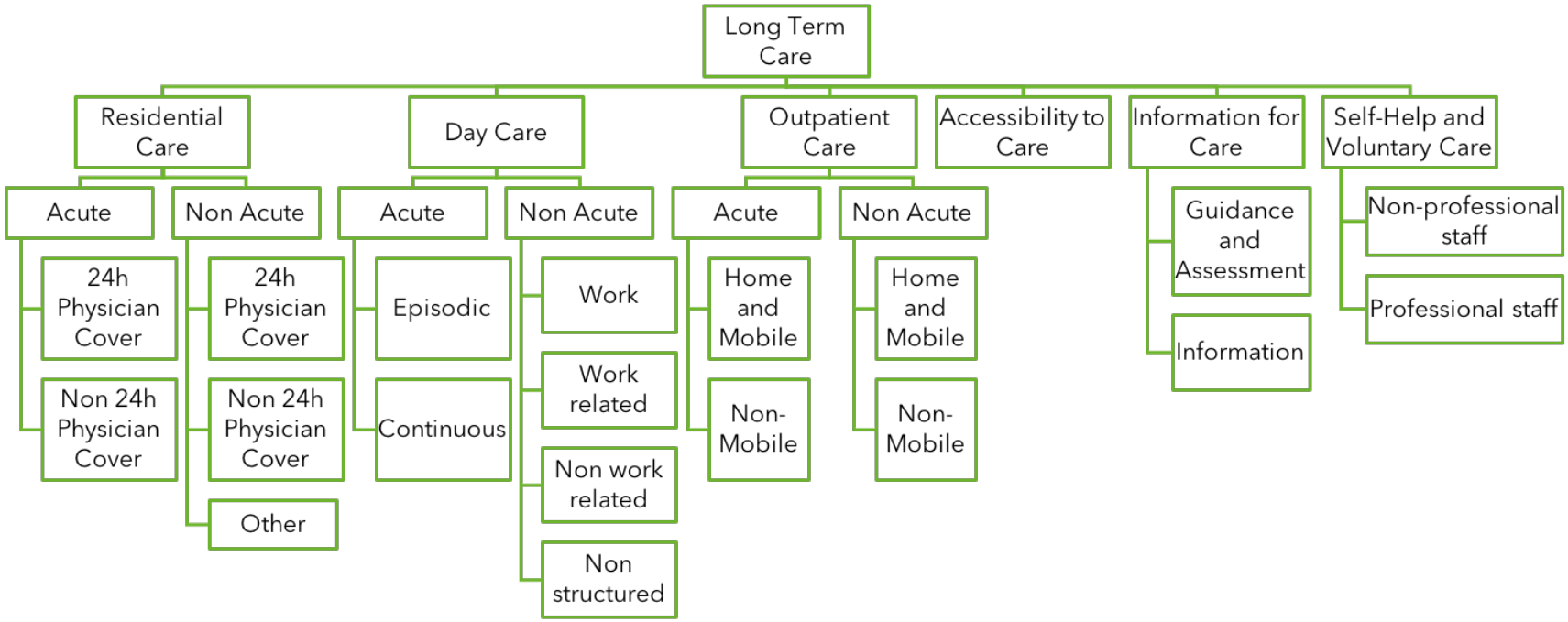


FIGURE 2 MAIN TYPE OF CARE - CORE VALUES

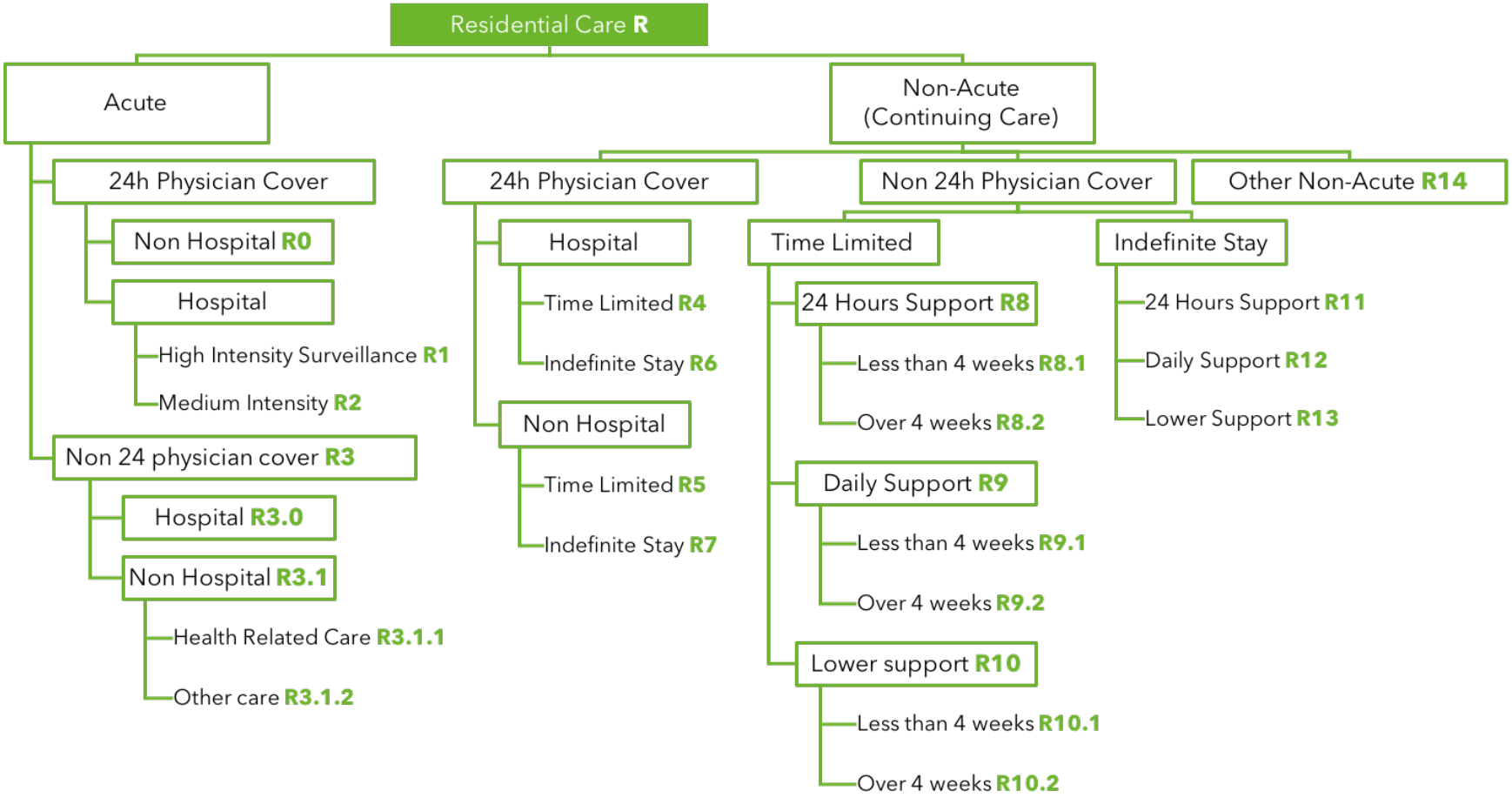


FIGURE 3 RESIDENTIAL CARE CODING BRANCH

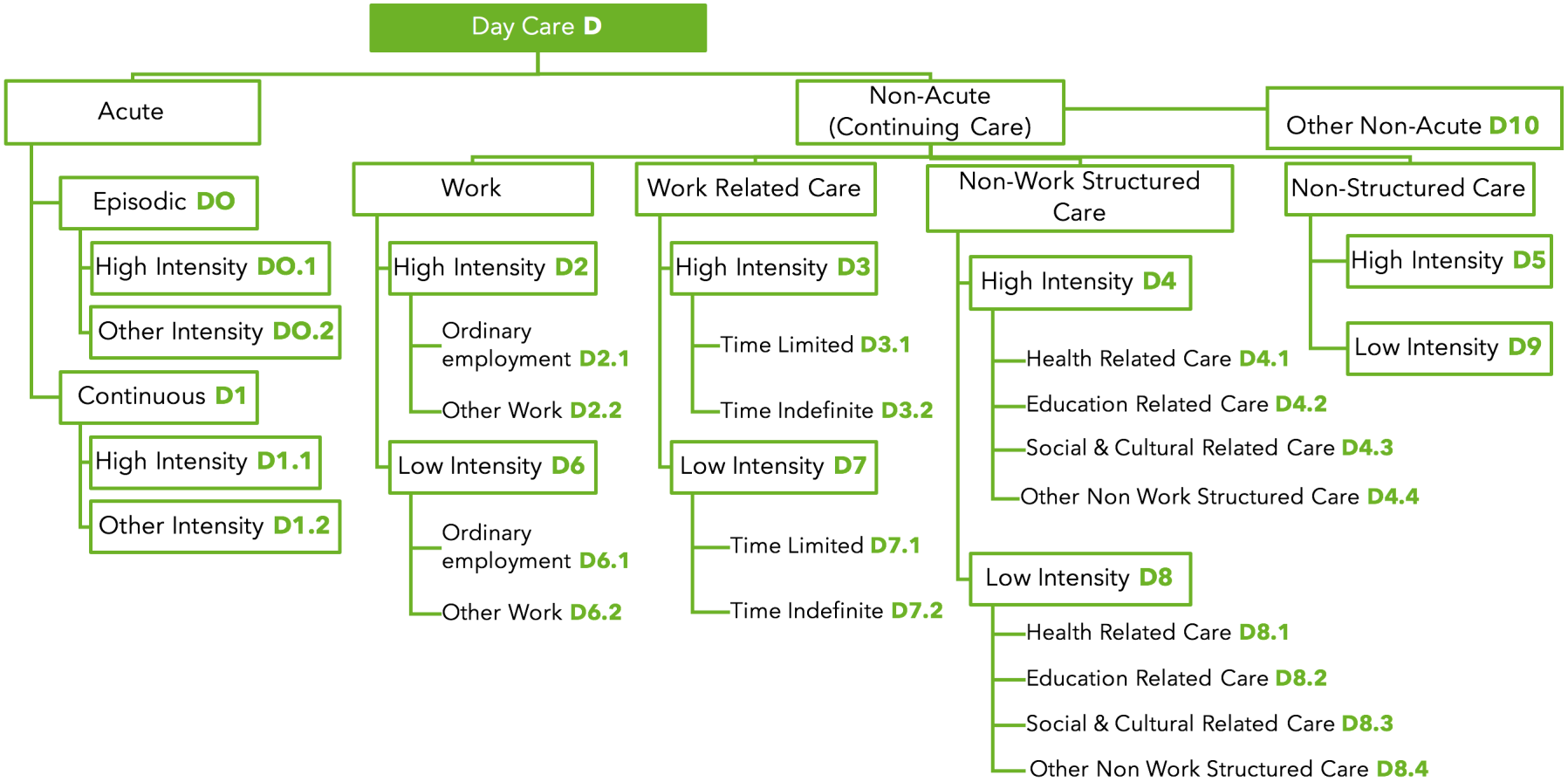


FIGURE 4 DAY CARE CODING BRANCH

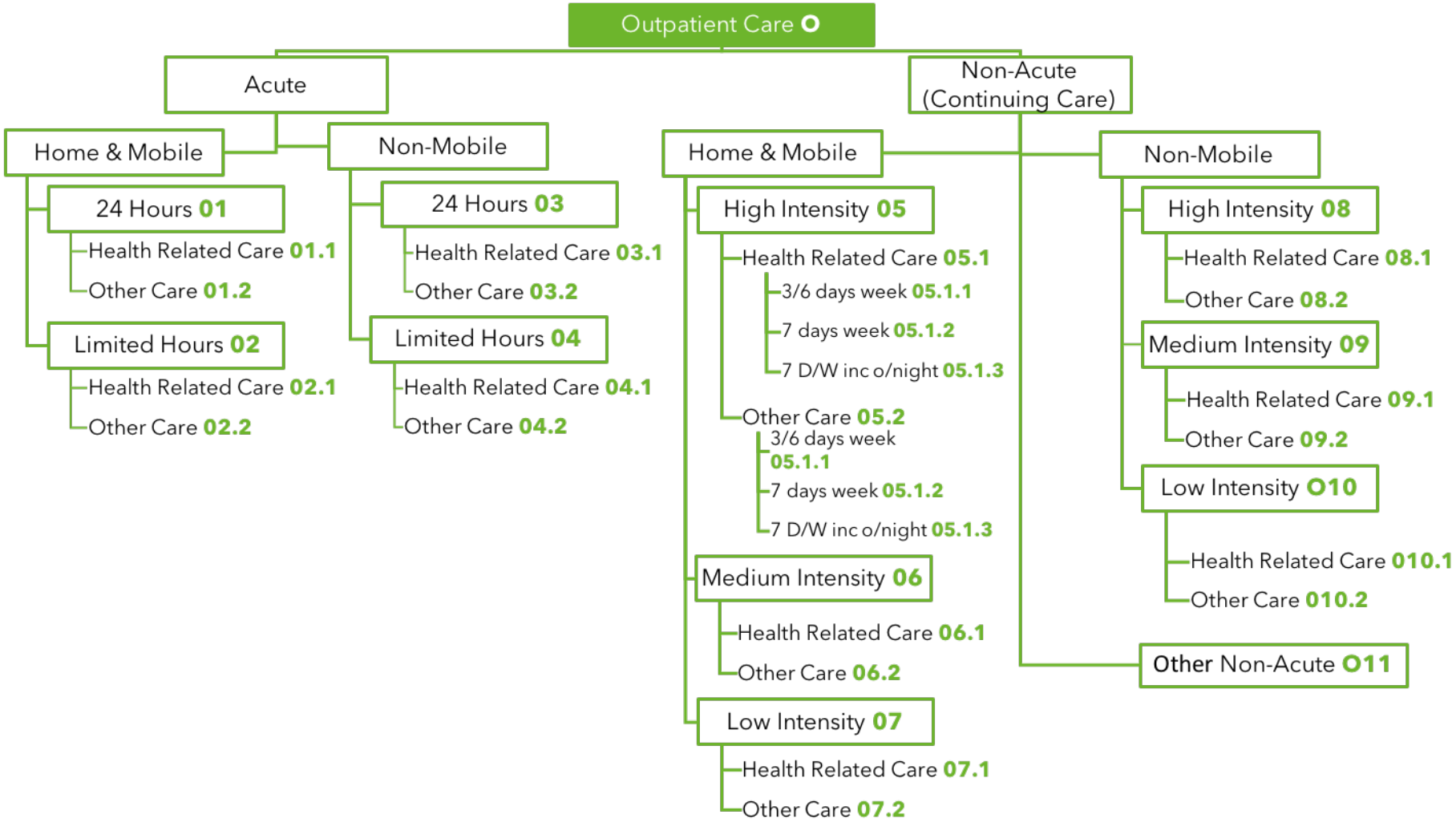

Outpatient Care O
Acute
Non-Acute (Continuing Care)
Home & Mobile
Non-Mobile
Home & Mobile
Non-Mobile
24 Hours 01
Health Related Care 01.1
Other Care 01.2
Limited Hours 02
Health Related Care 02.1
Other Care 02.2
24 Hours 03
Health Related Care 03.1
Other Care 03.2
Limited Hours 04
Health Related Care 04.1
Other Care 04.2
High Intensity 05
Health Related Care 05.1
3/6 days week 05.1.1
7 days week 05.1.2
7 D/W inc o/night 05.1.3
Other Care 05.2
3/6 days week 05.1.1
7 days week 05.1.2
7 D/W inc o/night 05.1.3
Medium Intensity 06
Health Related Care 06.1
Other Care 06.2
Low Intensity 07
Health Related Care 07.1
Other Care 07.2
High Intensity 08
Health Related Care 08.1
Other Care 08.2
Medium Intensity 09
Health Related Care 09.1
Other Care 09.2
Low Intensity O10
Health Related Care 010.1
Other Care 010.2
Other Non-Acute O11

FIGURE 5 OUTPATIENT CARE CODING BRANCH

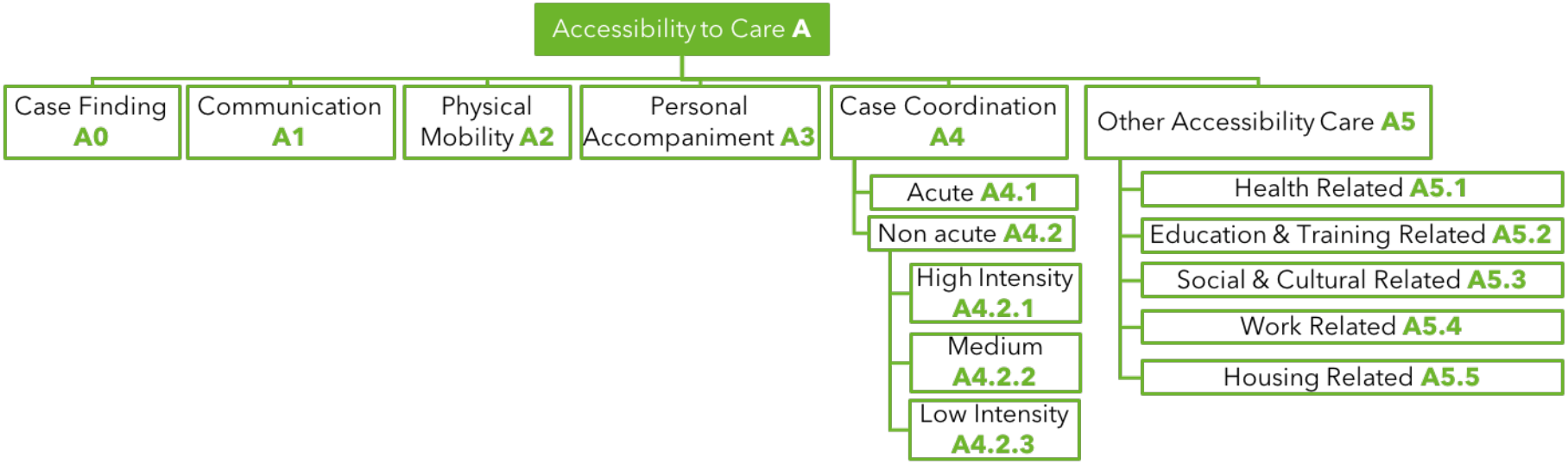


FIGURE 6 ACCESSIBILITY TO CARE CODING BRANCH

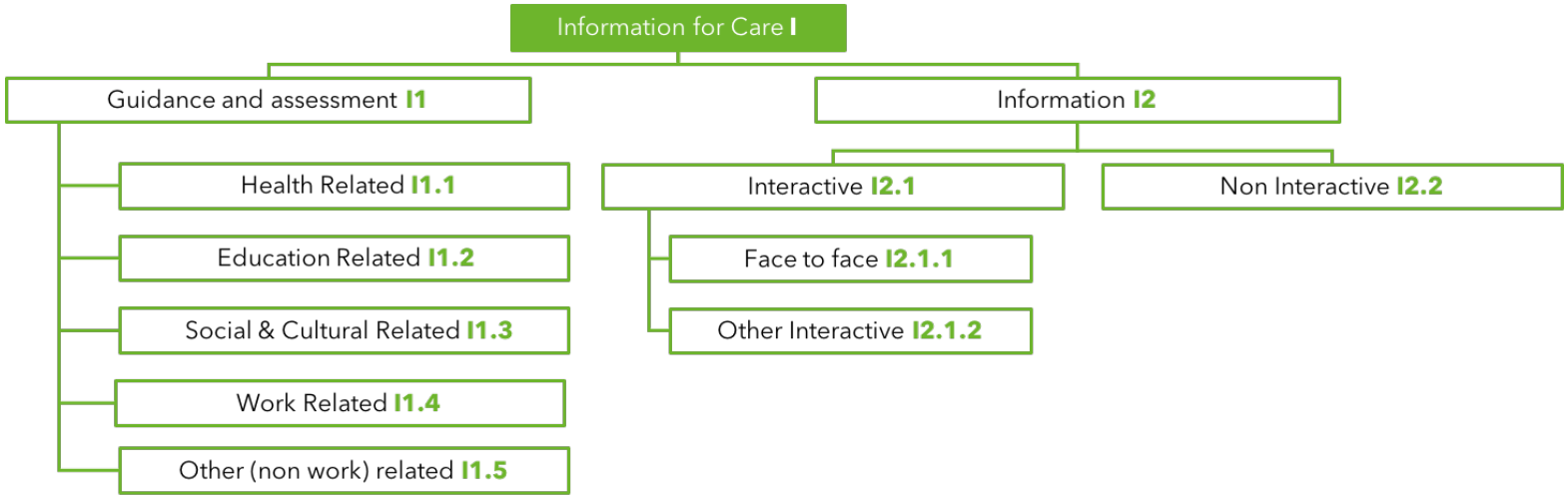


FIGURE 7 INFORMATION FOR CARE CODING BRANCH

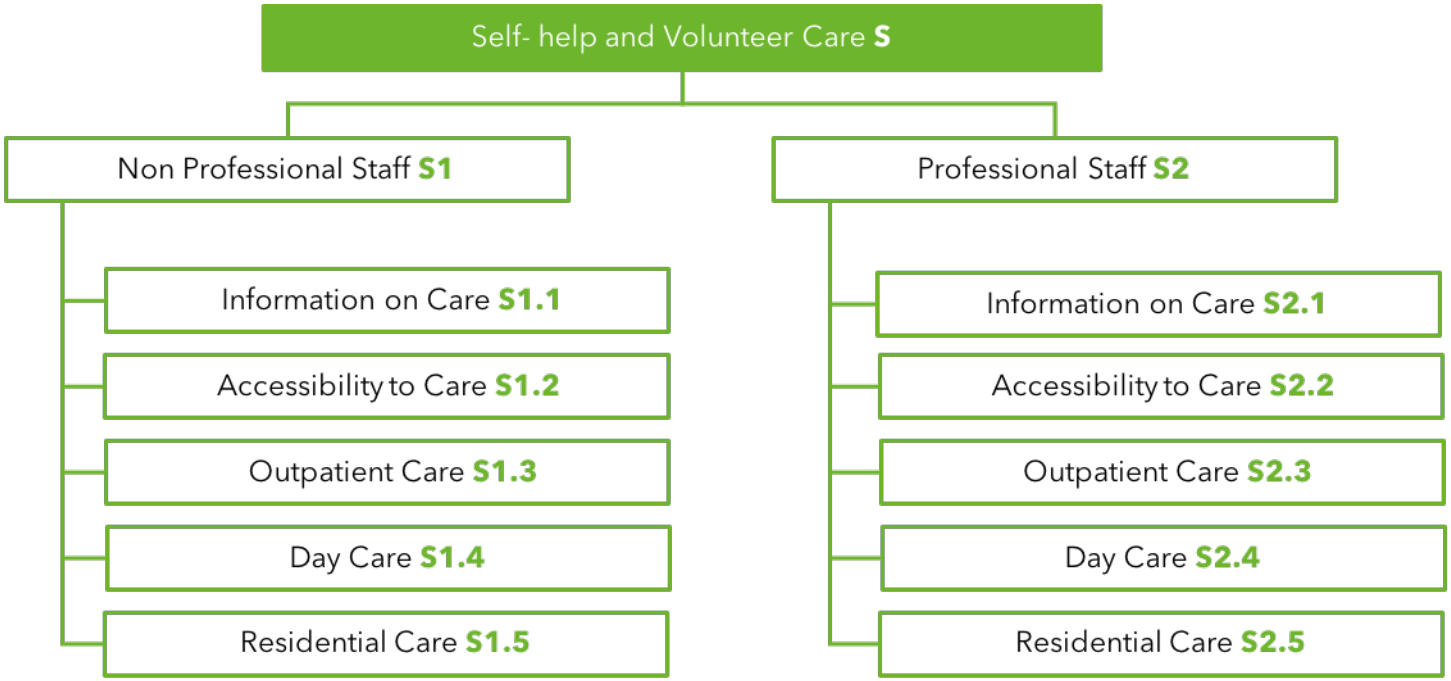


FIGURE 8 SELF-HELP AND VOLUNTEER CARE CODING BRANCH

3.3 Inclusion Criteria

The Integrated Atlas has clear inclusion criteria to ensure consistency and comparability across Atlases created using the DESDE methodology, both internationally and across Australia.

To be included in the Atlas a service has to meet certain inclusion criteria:

The service is specialised - The service must specifically target people with ether Diabetes mellitus, CVD or COP disease. That is, the primary reason for using the service is for treatment of these chronic diseases. This excludes generalist services that may treat people with chronic disease but are not specifically specialised in the treatment of a particular chronic disease.

The service is universally accessible - The Atlas focuses on services that are universally accessible, regardless of whether they are publicly or privately funded. Only services that do not have a significant out-of-pocket cost are included. Despite the availability of Medicare-subsidised chronic health-related services, access to most private services in Australia requires an individual to have private health insurance coverage, higher income or savings. The inclusion of private providers would give a misleading picture of the resources available to most people living with chronic disease issues and obscures the data for evidence informed planning of the public health system.

The service is 'stable', that is, it has or will receive funding for more than three years - The inclusion of stable services guarantees that the mapping reflects the robustness of the system as a basis for evidence informed planning. As such services that are pilot projects or are provided through short term grants are excluded. However, there is an appreciation that the current environment is one where there is significant uncertainty around the continuation of funding streams at both State and Federal level. As such, some flexibility has been applied with this criterion. For example, services were included where they were considered to be ongoing, or had been delivered over a long period of time, even when their ongoing funding may not be secured beyond one year. This is also relevant where a service may be deemed continuing, even though its funded provider may change over time.

The service is within the boundaries of Dubbo and Coonamble Local Government Areas (LGAs) – Only services that are based within the boundaries of Dubbo and Coonamble are included.

The service provides direct care or support to clients - Services that were only concerned with the coordination of other services or system improvement, without any type of direct contact with people with a chronic disease were excluded.

3.4 Atlas Development Process

There were five key steps involved in the creation of the Integrated Chronic Care Atlas for Dubbo and Coonamble (Figure 9).

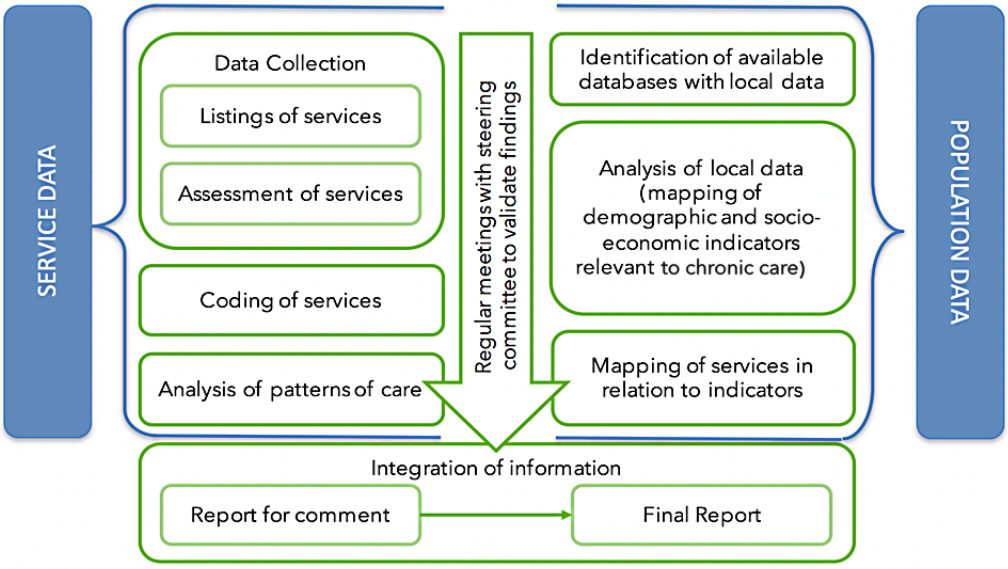


FIGURE 9 INTEGRATED CHRONIC CARE ATLAS DEVELOPMENT PROCESS

Step 1 – Ethics and Governance Approval

The ethics process for the development of the WNSW PHN Chronic Care Atlas involved the internal review and approval by the Executive Manager, Planning and System Improvement at WNSW PHN.

Step 2 - Data Collection

The first step in the development of the Atlas was to seek a list of relevant stakeholders from the WNSW PHN and undertake a range of meetings with the PHN, relevant peak bodies and sector representatives to scope and prepare a list of all services providing chronic disease care across the Dubbo and Coonamble areas.

A preliminary examination of organisations on the list was then undertaken to verify and pre-qualify their appropriateness for inclusion in the Atlas. Following pre-qualification, a determination was made on the best point of contact for each organisation for the purposes of gathering the information necessary to create the Atlas.

The Integrated Atlas methodology provides the framework and template for the information that needed to be gathered. This included:

- basic service information (e.g. name, type of service, description of governance)
- location and geographical information about the service (e.g. service of reference, service area)
- service data (e.g. opening days and hours, staffing, management, economic information, legal system, user profile, number of clients, number of contacts or admissions, number of days in hospital or residential accommodation, number of available beds or places, links with other services), and
- additional information (e.g. name of coder, date, number of observations and problems with data collection).

This information was gathered through a range of means, including face to face interviews, telephone interviews and through an online survey tool. Direct contact is usually required at some point during the process to seek additional information and answer questions in order to support and verify classification decisions.

Step 3 – Codification

Information gathered in step two was entered into a master spreadsheet, analysed and allocated a code (where the service delivery team meets the inclusion criteria). The work of each service delivery team was coded following the criteria defined in the DESDE-LTC, according to the MTC provided. Codes can be split into four different components and follow a standard format. The four components are:

1. Client age group: This represents the main target group for which the service is intended or currently accessed by, using capital letters.

GX**	All age groups
CC	Only children (0-11 years)
CA	Only adolescent (12-17 years)
CX*	Child & Adolescents (0-17 years)
CY*	Adolescents and Young Adults (12-25 years)
TA	Period from adolescent to adult (16-25 years)
AX	Adults (18-65 years)
OX	Older adults (> 65 years)

An additional letter is added to the age code where a service is gender specific; for example, AXF is used to indicate a service is specifically targeted at females 18-64 years of age. In the analysis section of this report, for simplification, the age codes are grouped as follows:

- Children and Adolescents (including young adults) – CC, CA, CX, CY and TA
- Adults (Including services with no age specification) – AX and GX
- Older Adults – TO and OX

2. ICD-10 Code: ICD-10 codes appear in brackets after the age group code but before DESDE-LTC code in order to describe the main diagnostic group covered by the service. If the client of the service is a child, but the professional is working with the family, the code [e310] (immediate family or carers) from the International Classification of Functioning (ICF) is used. The key diagnostic codes used in this Atlas are:

I00-I99	Diseases of the circulatory system
J00-J99	Diseases of the respiratory system
E08-E13	Diabetes mellitus
Z13.1	Encounter screening for diabetes mellitus
Z83.3	Family History of Diabetes Mellitus
ICDc	Used where there is not a specific diagnostic group for this chronic care service

3. DESDE-LTC code: The third component of the code is the core DESDE-LTC code which signifies the MTC. The services are classified according to their main type of care. The six main types of care are:

R	Residential Care
D	Day Care
O	Outpatient Care
A	Accessibility to Care

I	Information for Care
S	Self-Help and Voluntary Care

4. Qualifiers: In some cases, a 4th component may be incorporated to facilitate a quick appraisal of those characteristics of the services which may be relevant to local policy. The qualifiers used in this Atlas are:

a	**Acute care (complimentary) -** Used where Acute care is provided within a Non-Acute, non-Residential setting but does not fit the criteria for the addition of a second MTC.
c	**Closed care -** Denotes secluded MTC with a high level of security (e.g. locked doors).
d	**Domiciliary care** - Denotes this service is provided wholly at the home of the service user. Used for Hospital in the Home services for example.
e	**eCare** - Includes all care services relying on telephone, modern information and communication technologies (ICTs) (e.g. tele-care/tele-medicine, tele-consultation, tele-radiology, tele-monitoring).
g*	**Group -** This DRAFT qualifier is applied to Outpatient services that provide predominantly group activities and do not meet the criteria for a Day Care service (Typically 80% of their activity is through the provision of groups).
h	**Hospital (Care provided in a hospital setting) -** Describes non-Residential MTC (“O” or “D”) provided within the hospital setting.
j	**Justice care** - Describes BSIC whose main aim is to provide care to individuals in contact with crime and justice services.
l	**Liaison care** - Describes liaison BSIC where specific consultation for a subgroup of clients from another area within the facility (e.g. mental health care to a cancer ward of a hospital).
m	**Management -** Describes an MTC where management, planning, coordination or navigation of care a core part the provision of their outpatient care.
r	**Reference -** Describes a MTC which operates as the main intake or referral point for the local area.
s	**Specialised care** - Describes BSIC for a specific subgroup within the target population of the catchment area (e.g. eating disorders service).
t	**Tributary** - Describes an MTC that is a satellite team dependant on another main care team.
u	**Unitary -** Describes an MTC that consists of only one team member.

*Draft qualifiers have been added to tailor the Atlas more precisely to the local environment. These will be formally processed for inclusion into the international DESDE-LTC tool at its next revision.

Example:

A Non-Acute unitary team in a hospital for adults with a disease of the respiratory system will receive the following code: AX[J00-J99] - R4u (Figure 10).

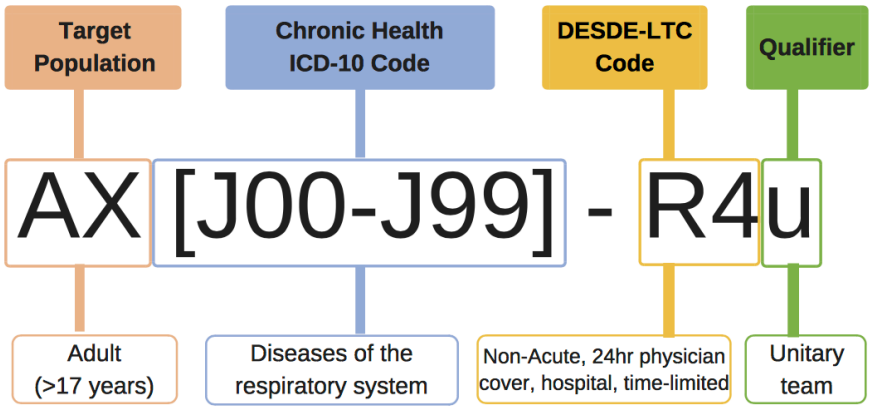


FIGURE 10 CODE COMPONENTS EXAMPLE

To assist the reader, a DESDE-LTC Quick Reference Guide has been included (Appendix A). This can be removed and laminated to use as an interpretation guide whilst reading the Atlas if required.

Step 4 - Mapping the BSIC

The next step in the construction of the Atlas was to map the supply of chronic disease services in relation to indicators of potential demand within the Dubbo and Coonamble areas. To achieve this step, the BSIC data was exported into a Geographic Information System (GIS) for visualisation.

Step 5 - Description of the Pattern of Care - Service Availability and Capacity

The availability of services was analysed according to their MTC as well as their capacity.

- **Availability** - Defined as the presence, location and readiness for use of service delivery teams in a catchment area at a given time. A service is available when it is operable or usable upon demand to perform its designated or required function. The availability rate for the MTC is calculated per 100,000 of the target population. For example, for services for children and adolescents the estimated residential population of children and adolescents is used.
- **Placement Capacity** - This is the maximum number of beds in Residential Care and places in Day Care in a care delivery organisation or a catchment area at a given time. Rates are also calculated per 100,000 of the target population.
- **Spider Diagrams** - To understand the balance between the different types of care offered in an area, a radar chart tool, also referred to as a spider diagram is used. The spider diagram is essentially a tool to visually depict the pattern of care in an area. Each of the 21 points on the radius of the diagram represents the number of MTC for a particular type of care per 100,000 population.

This analysis allows for comparisons of the availability and capacity of care with other areas and other types of care (for example mental health care) where appropriate.

4. Dubbo and Coonamble

Dubbo is a major regional town located in the WNSW PHN and the WNSW LHD region. It sits close to the eastern border of the PHN, bordered to the west by Narromine, Gilgandra and Parkes, and to the South by the towns of Orange and Bathurst. Coonamble sits further north of Dubbo, with a greater land area, but a relatively smaller population (Figure 11).

4.1 Population Health and Socio-Demographic Indicators

The most recent publicly available data sources have been examined in relation to social, economic and demographic indicators for the WNSW PHN region. The primary data sources for this information were:

- 2011 Census of Population and Housing (ABS, 2011)
- Social Health Atlases of Australia (PHIDU, 2016), and
- Small Area Labour Market Data (CDE, 2017).

Where data permitted, indicators have been reported at the level of LGA with comparison to the WNSW PHN region, state and national averages. Geo-spatial mapping of data has been provided as within-catchment comparisons of each LGA contained within the WNSW PHN region, with the exception of socio-economic disadvantage which is presented as deciles[1], ranked nationally.

Key demographic, socio-economic factors and health outcomes data relevant to chronic disease are included to better understand the population needs across the region.

Demographic Factors

For the purposes of this Atlas, a selection of indicators are provided to examine key at risk groups and create a demographic profile for the region (Table 4). In addition, throughout the Atlas the population is divided into discrete age groups to report rates of services per 100,000 target population.

TABLE 4 DEMOGRAPHIC FACTORS EXAMINED

Indicator	Description	Calculation
Dependency Ratio	Portion of dependants (people who are too young or too old to work) in a population	Population aged 0-14 and >64 years / Population 15-64 years per 100 persons
Ageing Index	Indicator of age structure of population - elder-child ratio	Population >64 years / Population 0-14 years per 100 persons
Indigenous Status	People who identify as being of Aboriginal or Torres Strait Islander origin	Aboriginal population as per cent of total population (ERP - non-ABS)
Overseas Born	Proportion of the Australian population born overseas	Total people who stated an overseas country of birth as per cent of total population (ERP)

[1] Deciles are created by dividing the distribution of a variable into ten groups with equal frequencies, so that each part represents 1/10 of the sample or population.

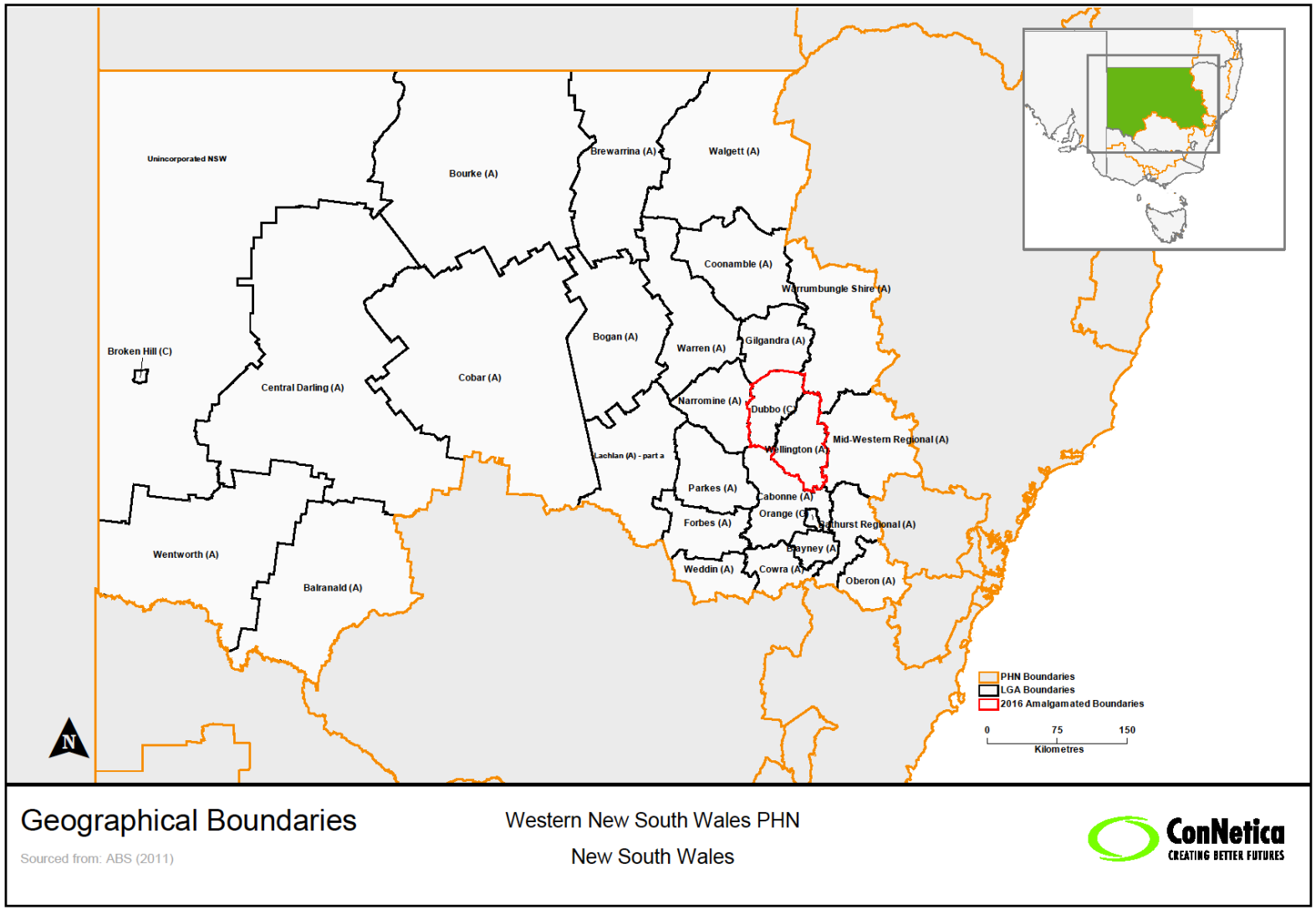


FIGURE 11 GEOGRAPHICAL BOUNDARIES OF THE WNSW PHN REGION

Social Determinants

The concept of social determinants of health acknowledges the importance of employment, housing, education and other social resources (such as isolation and community connectedness) to health and wellbeing. Social determinants are increasingly recognised as playing a major role in a raft of health related behaviours and health disparities, including chronic disease (Cockerham et al, 2017; Marmot, 2005). Risk factors that have been shown to influence chronic disease have been presented in this Atlas. These are detailed in Table 5 below and include the Socio Economic Indexes for Areas (SEIFA) which compares the relative socio economic advantage and disadvantage across geographic areas.

Measuring Disadvantage

Disadvantaged Australians have higher rates of almost all disease risk factors, use preventative health services less and have poorer access to primary care health services when compared to Australians in average or higher socio-economic condition areas. Based on the Census data, SEIFA incorporates four measures – income, education, occupation and economic resources.

The Index of Relative Socio-economic Disadvantage (IRSD) score is a measure of the relative disadvantage in a given geographic area (ABS, 2011c). The IRSD scores are based on standardised distribution across all areas and are an important measure for health service planning. The average IRSD score across Australia is 1,000 and nationally two thirds of all areas lie between an index score of 900 and 1,100. For this Atlas, areas are shown in deciles with the lower the score representing a greater level of relative disadvantage (e.g. 1 represents the most disadvantaged areas).

TABLE 5 SOCIOECONOMIC FACTORS EXAMINED

Indicator	Description	Calculation
Single Parent Families	Proportion of single parent families with children aged less than 15 years	Single parent families with children under 15 years / Total families with children under 15 years per 100
Homelessness	Estimated number of homeless people per 1,000 population on Census night by LGA, derived from the Census of Population and Housing using the ABS definition of homelessness	Estimated number of homeless persons per 1,000 population
Needing Assistance	Proportion of the population with a profound or severe disability – defined as people needing help or assistance in one or more of the three core activity areas of self-care, mobility and communication, because of a disability, long term health condition (lasting six months or more) or old age	Number of people who need assistance with core activity / Total population per 100
Early School Leavers	The data comprise people who left school at Year 10 or below, or did not go to school, expressed as an indirectly standardised rate per 100 people aged 15 years and over (Usual Resident Population), based on the Australian standard	People who left school at Year 10 or below, or did not go to school, ASR per 100 persons
Unemployment	The level of unemployment as a proportion of the labour force	Number of unemployed people / Population >15 years per 100
Low income	Proportion of individuals in a population earning less than $400 per week, including those on negative incomes	Number of Individuals with income <$400 week / Total number of individuals per 100

IRSD (Index of Relative Social Disadvantage)	One of four SEIFA indexes, IRSD identifies the geographic distribution of potential disadvantage based on factors including employment, education, income and social resources	Please refer to the following technical paper: http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/22CEDA8038AF7A0DCA257B3B00116E34/$File/2033.0.55.001%20seifa%202011%20technical%20paper.pdf

4.2 Demographics

The focus of this Chronic Care Atlas project is primarily on the LGAs of Dubbo and Coonamble. However, to provide context for the two LGAs and where they sit in relation to surrounding and regional/rural LGAs, data will be provided for all LGAs within the catchment of the WNSW PHN region. State and national data will also be provided for broader reference.

The population breakdown between children and adolescents (ages 0-19), adults (ages 20-64) and older adults (ages 65 and above) are displayed for Dubbo and Coonamble (Table 6).

TABLE 6 POPULATION AGE BREAKDOWN IN DUBBO AND COONAMBLE

LGA	Children / Adolescents†	Adults†	Older Adults†	Total
Dubbo	12,152 (30%)	23,475 (56%)	6,307 (14%)	41,934 (100%)
Coonamble	1,099 (26%)	2,385 (56%)	778 (18%)	4,262 (100%)

† ERP 2015 (PHIDU, 2016)

Both LGAs have 56% adult populations and similar population profiles except for a slightly higher proportion of older adults residing in the Coonamble region.

It should be noted that the health and chronic disease indicator data presented are estimates relying on response rates to the Australian Health Survey. As such, there are instances where blood samples or self-report instruments were relied upon to inform and model these estimates. Such samples and data gathering may be difficult to obtain in higher deprived Aboriginal populations, which may affect estimates in areas across the WNSW PHN catchment. Furthermore, estimated data often excludes LGAs and areas with 1,000 people or less, or those areas that are geographically very remote - both of which are present in the WNSW PHN region.

Key population demographics for Dubbo, Coonamble, the WNSW PHN region and NSW include the Estimated Residential Population (ERP) as well as indicators of the age structure of the population using measures such as the Dependency and Ageing Ratios (Table 7). The diversity of the population is examined utilising the indicators of Indigenous status and proportion of those born overseas (Table 7). The target areas of Dubbo and Coonamble are highlighted.

TABLE 7 DEMOGRAPHIC FACTORS IN THE WNSWS PHN REGION

LGA	Area * (sq. km)	Total Population †	Density Ratio	Dependency Ratio	Ageing Index	Indigenous Status (%)‡	Overseas Born (%)*
Balranald	21,693	2422	0.11	0.53	98.9	8.3	7.2
Bathurst	3,816	42231	11.07	0.54	75.9	5.3	8.3
Blayney	1,525	7380	4.84	0.67	78.2	3.7	6.0
Bogan	14,601	3059	0.21	0.67	81.9	18.0	3.7
Bourke	41,605	2876	0.07	0.60	51.4	38.1	3.3
Brewarrina	19,165	1917	0.10	0.64	41.3	67.4	2.5
Broken Hill	170	18856	110.73	0.63	121.7	9.5	4.5
Cabonne	6,024	13860	2.30	0.69	92.0	3.8	6.2
Central Darling	53,494	2088	0.04	0.58	64.6	43.7	5.9
Cobar	45,571	4975	0.11	0.55	52.4	16.3	6.8
Coonamble	9,916	4262	0.43	0.59	97.3	35.7	2.3
Cowra	2,809	12476	4.44	0.69	132.4	8.0	5.9
Dubbo	3,426	41934	12.24	0.59	68.5	15.6	5.5
Forbes	4,718	9754	2.07	0.66	100.5	11.9	4.0
Gilgandra	4,832	4368	0.90	0.76	131.0	14.5	3.5
Lachlan (a)	11,664	4923	0.42	0.70	89.4	20.9	3.5§
Mid-Western	8,753	24191	2.76	0.64	93.1	4.9	8.1
Narromine	5,260	6822	1.30	0.77	80.9	23.0	3.8
Oberon	3,627	5318	1.47	0.64	114.8	3.8	9.7
Orange	284	41809	147.25	0.57	69.0	6.6	8.5
Parkes	5,955	15337	2.58	0.66	89.5	10.1	4.8
Walgett	22,309	6791	0.30	0.63	99.0	33.8	10.6
Warren	10,754	2901	0.27	0.65	88.6	16.5	4.1
Warrumbungle	12,371	9728	0.79	0.76	126.8	11.2	5.5
Weddin	3,409	3701	1.09	0.78	149.7	2.3	5.0
Wellington	4,110	9073	2.21	0.68	99.5	24.3	5.5
Wentworth	26,257	6883	0.26	0.62	94.4	12.6	5.3
Unincorp. NSW	93,109	716	0.01	0.55	85.3	7.3	11.1
WNSW PHN	**441,225**	**310,610**	**0.70**	**0.62**	**86.8**	**11.6**	**6.7**
NSW	809,444	7.62 million	9.4	0.53	83.8	3.0	25.7
Australia	7.7 million	23.78 million	3.1	0.51	79.7	3.1	24.6

Sourced from: * ABS, 2011 Census; † ERP 2015 (PHIDU, 2016); ‡ ERP (non ABS) 2015 (PHIDU, 2016); §reflects entire LGA

Population Profile

The population in the WNSW PHN region is most concentrated in the towns of Broken Hill and Orange, with Density Ratios of 110.73 and 147.25 respectively. Dubbo's population is comparable to Bathurst and Orange, but is geographically more spread out than these LGAs (Figure 12). The Ageing Index is

highest in Weddin (149.7) and lowest Brewarrina (41.3). The density ratio disparity between Dubbo and Coonamble reflects Coonamble having a land area three times the size of Dubbo.

Cultural Diversity

The percentage of people identifying as Aboriginal or Torres Strait Islander in the WNSW PHN catchment is above the Australian average (3.1%) for all but one LGA within the WNSW PHN area, Weddin (2.3%) (Figure 13). It is pertinent to note however that there is considerable suburb variability within LGAs in relation to the proportion of Aboriginal or Torres Strait Islander residents, and this has implications for the location of some of the Indigenous specific chronic care related services. The Brewarrina LGA has the highest proportion of Aboriginal and/or Torres Strait Islander population at 67.4%. In Coonamble, approximately 35% of the population are Aboriginal and/or Torres Strait Islander, compared with 15.6% for Dubbo. Given Dubbo LGA has a significantly higher population, the total number of Aboriginal and/or Torres Strait Islander people is larger than in Coonamble. Coonamble has the lowest proportion of overseas born residents of any LGA in the WNSW PHN region (Figure 14).

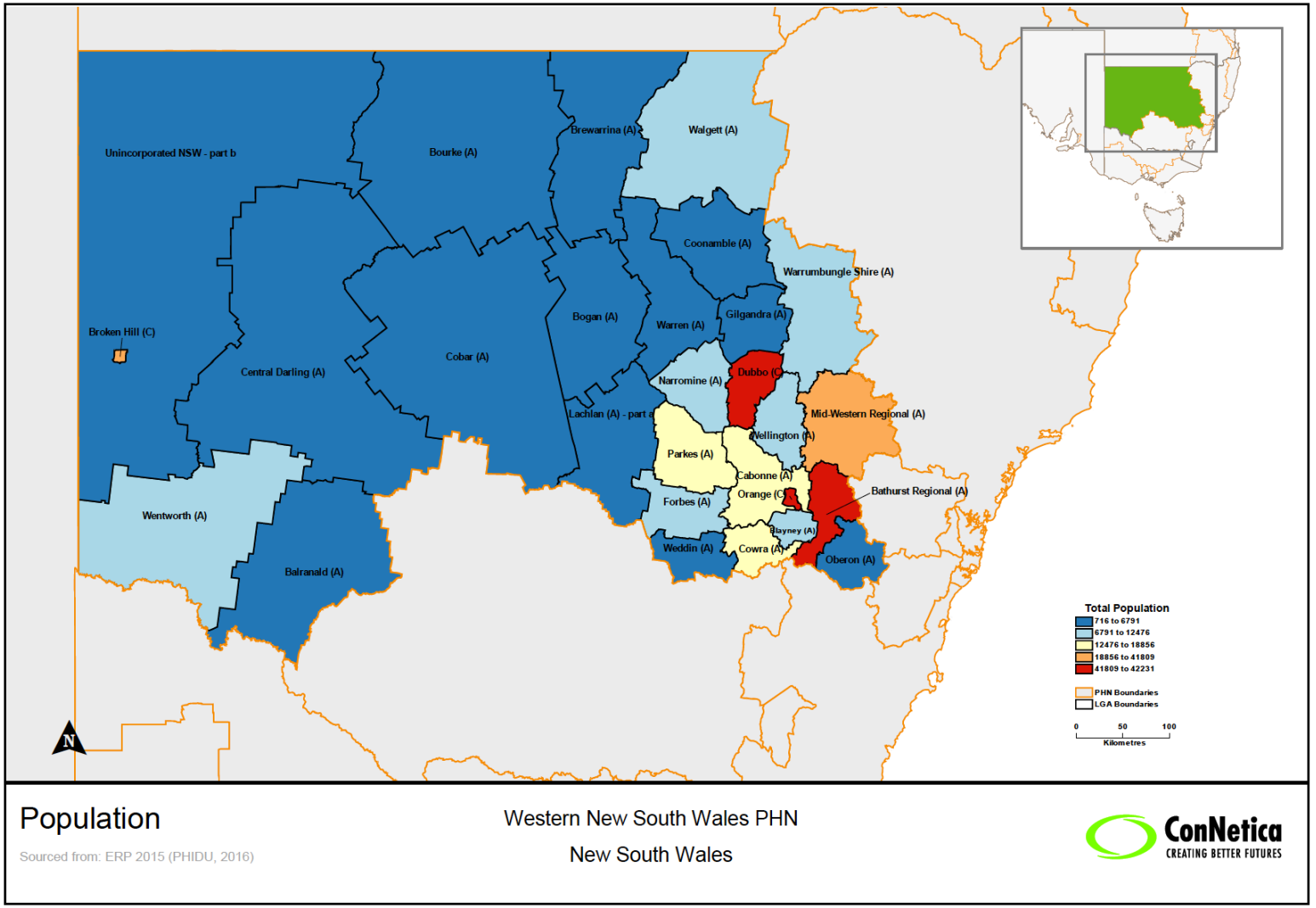


FIGURE 12 POPULATION IN THE WNSW PHN REGION

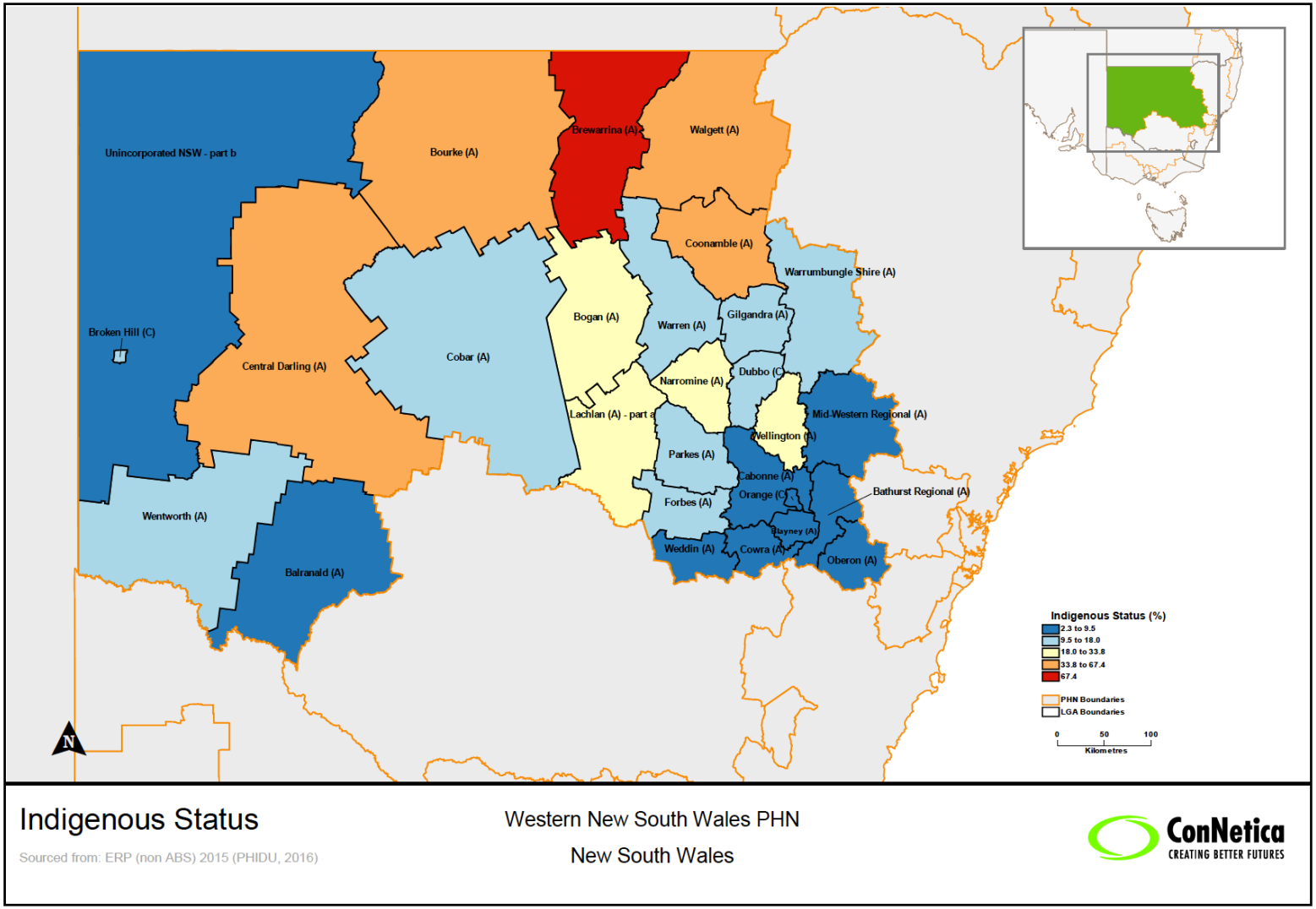


FIGURE 13 INDIGENOUS STATUS IN THE WNSW PHN REGION

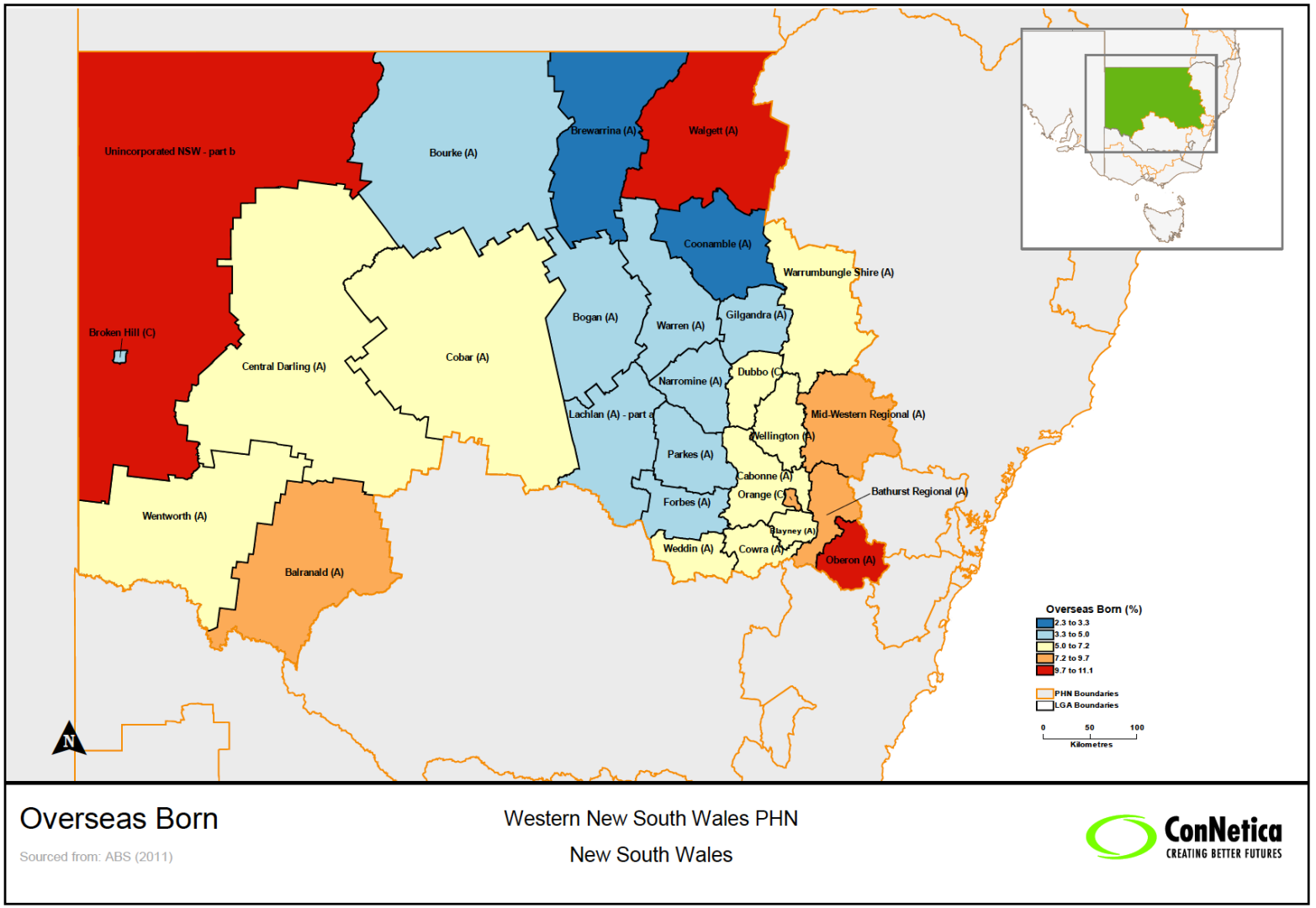


FIGURE 14 OVERSEAS BORN IN THE WNSW PHN REGION

4.3 Socio-demographic Data

Social determinants are increasingly recognised as playing a major role in the prevalence of chronic illness in communities.

TABLE 8 SOCIOECONOMIC FACTORS IN THE WNSW PHN REGION

LGA	Single parent families* (%)	Needing Assistance† (%)	Early School Leavers* (ASR per 100)	Un employment‡ (%)	Income <$400/wk† (%)	IRSD Score (Decile)†
Balranald	19.1⇩	5.3⇧	44.3⇧	2.7⇩	44.9⇧	946 (3)
Bathurst	25.2⇧	4.7⇩	42.7⇧	4.2⇩	40.2⇧	991 (7)
Blayney	20.0⇩	5.2⇧	49.2⇧	4.0⇩	40.1⇧	982 (6)
Bogan	24.9⇧	4.0⇩	49.9⇧	3.9⇩	44.7⇧	946 (3)
Bourke	29.6⇧	4.1⇩	52.6⇧	7.7⇧	36.8⇩	933 (3)
Brewarrina	42.1⇧	4.6⇩	51.6⇧	7.8⇧	54.9⇧	788 (1)
Broken Hill	37.2⇧	8.1⇧	53.4⇧	6.2⇧	49.0⇧	900 (2)
Cabonne	17.6⇩	5.1⇩	47.2⇧	2.9⇩	41.2⇧	1000 (7)
Central Darling	34.7⇧	3.7⇩	55.7⇧	6.5⇧	52.0⇧	824 (1)
Cobar	20.6⇩	3.6⇩	54.8⇧	2.0⇩	39.7⇩	957 (4)
Coonamble	37.4⇧	6.9⇧	49.5⇧	6.3⇧	47.0⇧	880 (1)
Cowra	24.3⇧	7.1⇧	50.6⇧	6.7⇧	49.0⇧	928 (2)
Dubbo	28.8⇧	5.4⇧	48.8⇧	3.7⇩¶	36.9⇩	977 (5)
Forbes	27.8⇧	6.1⇧	50.5⇧	4.4⇩	45.0⇧	947 (3)
Gilgandra	30.2⇧	6.4⇧	51.5⇧	4.2⇩	48.5⇧	911 (2)
Lachlan (a)	25.5⇧	5.6§⇧	50.5⇧	5.5§⇧	46.4§⇧	938 (3) §
Mid-Western	23.9⇧	6.0⇧	48.6⇧	5.4⇧	46.5⇧	962 (5)
Narromine	33.1⇧	4.4⇩	49.1⇧	4.1⇩	42.3⇧	927 (2)
Oberon	20.9⇩	4.7⇩	50.1⇧	4.0⇩	40.5⇧	976 (5)
Orange	26.0⇧	5.3⇧	47.3⇧	4.7⇩	37.9⇩	977 (5)
Parkes	28.0⇧	6.7⇧	50.7⇧	6.9⇧	46.0⇧	944 (3)
Walgett	36.5⇧	6.9⇧	47.8⇧	8.6⇧	52.4⇧	856 (1)
Warren	26.7⇧	5.1⇩	49.9⇧	4.2⇩	42.5⇧	941 (3)
Warrumbungle	26.7⇧	7.5⇧	48.7⇧	4.4⇩	53.5⇧	911 (2)
Weddin	23.3⇧	7.4⇧	48.8⇧	4.1⇩	53.0⇧	945 (3)
Wellington	33.1⇧	7.0⇧	48.4⇧	3.7⇩¶	49.1⇧	893 (1)
Wentworth	22.8⇧	5.6⇧	44.3⇧	7.7⇧	44.3⇧	957 (4)
Unincorp. NSW	13.1⇩	2.9⇩	48.0⇧	4.4⇩	36.1⇩	1022 (8)
WNSW PHN	**27.0**	**5.7**	**48.5**	**5.0**	**43.2**	**953**
NSW	21.2	5.2	37.6	5.1	39.9	996
Australia	21.3	4.6	34.3	5.7	38.9	1000

Sourced from: *2011 (PHIDU, 2016); †ABS, 2011 Census; ‡ March Quarter 2017 (Department of Employment, 2017); §reflects entire LGA; ¶In 2017, Dubbo and Wellington amalgamated to Western Plains Regional

The indicators presented in this report have been selected as they each have a relationship to poor physical health.

Disadvantaged Australians have higher rates of almost all disease risk factors, use preventative health services less and have poorer access to primary care health services than Australians in average or higher socio-economic condition areas. For this report, key socio-economic indicators that have been shown to be associated with poor health outcomes have been presented (Table 8). Apricot shading indicates LGAs with the worst score for that indicator, green shading represents the best score; Arrows indicate where figures are higher or lower than the state average.

Families

Coonamble has a higher proportion of single parent families (37.4%) than Dubbo (28.8%), the WNSW PHN region average (27%) and the state (21.2%) and national averages (21.3%). Coonamble is only eclipsed by Brewarrina for higher proportion of single parent families in the WNSW PHN region (Figure 15).

Human function

Coonamble (6.9%) was above the WNSW PHN region average, whilst Dubbo (5.4%) reflected the WNSW PHN region and state average closely (Figure 16). The majority of LGAs within the WNSW PHN catchment had higher proportions of the population needing assistance than the national average of 4.6%. The far western town of Broken Hill had the highest proportion of the population needing assistance at 8.1%, followed by Warrumbungle at 7.5%.

Education

Early school leavers per 100 population were considerably higher than the state (37.6) and national rates (34.3) in both Dubbo and Coonamble. No LGA had a rate lower than the state or the nation, with Bathurst recording the lowest rate at 42.7 per 100 population, and Central Darling faring poorly at 55.7 per 100 population. Dubbo and Coonamble had similar rates of early school leavers at approximately 50% of the population in each LGA (Figure 17).

Employment

The unemployment rate in Dubbo (3.7%) is comparatively lower to state (5.1%) and national (5.7%) averages, whilst Coonamble has an unemployment rate of 6.3%. Both LGAs have lower rates than Walgett (8.6%) (Figure 18).

Income

A majority of LGAs within the WNSW PHN catchment reported higher proportions of low individual income per week compared to the Australian average (38.9%). Unincorporated NSW (36.1%), Orange (37.9%), Dubbo (36.9%) and Bourke (36.8%) all had a lower proportion of the population earning less than $400 per week when compared with the state (39.9%) and national average (38.9%). For Coonamble, just under half of the population earn less than $400 per week (Figure 19).

Index of Relative Socio-economic Disadvantage

Most LGAs in the WNSW PHN region had IRSD scores lower than 1000, with Unincorporated NSW and Cabonne the only LGAs with a score of 1000 or above. Brewarrina has the highest level of disadvantage with an IRSD score of 788. Coonamble also lies in the lowest decile bracket with an IRSD score of 880.

It is pertinent to note however that at the suburb level there is considerable variability in IRSD scores within LGAs, and that there are suburbs within a number of the WNSW PHN LGAs that may have relative disadvantage scores greater than 1000 (ABS, 2011c) (Figure 20).

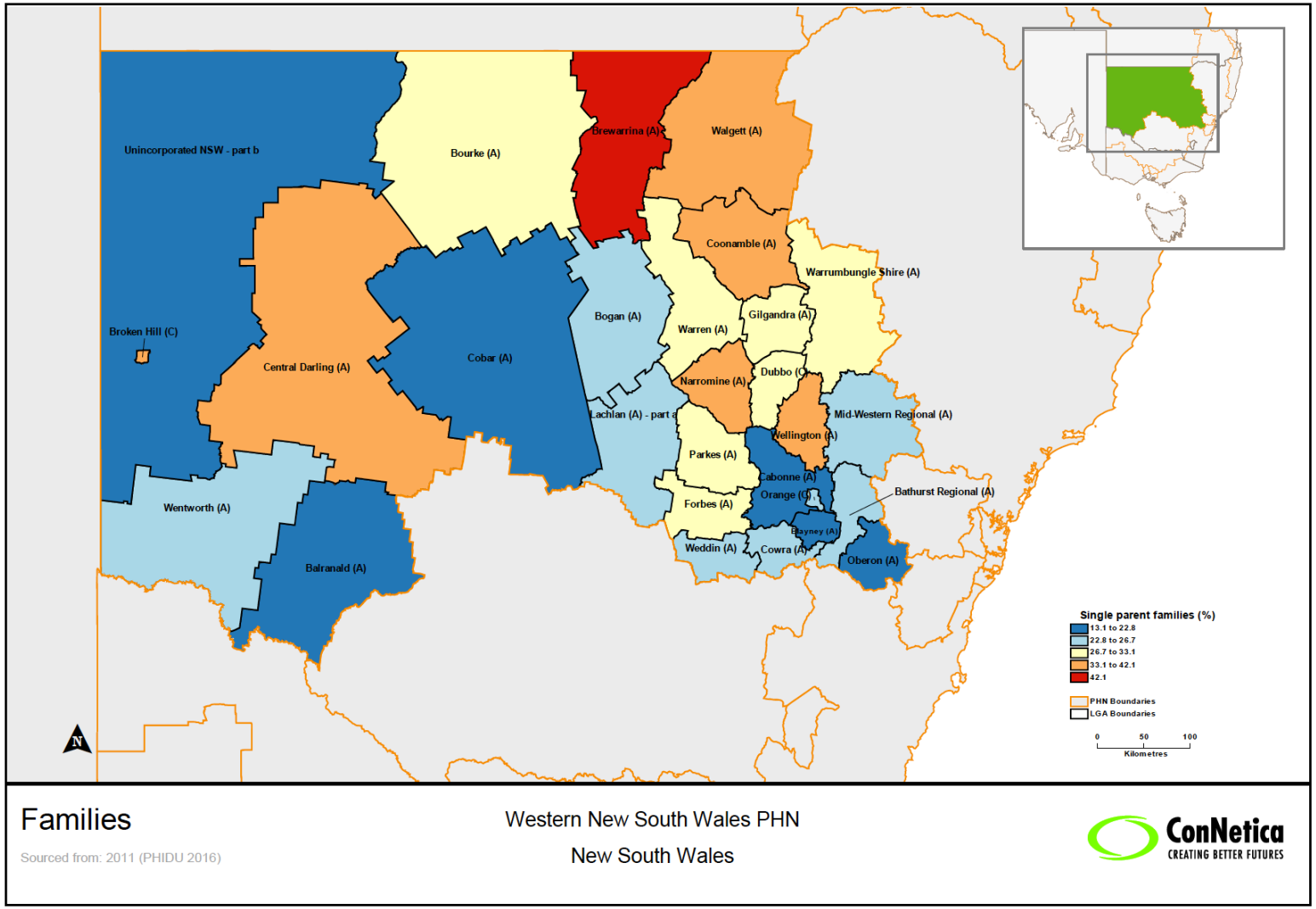


FIGURE 15 SINGLE PARENT FAMILIES IN THE WNSW PHN REGION

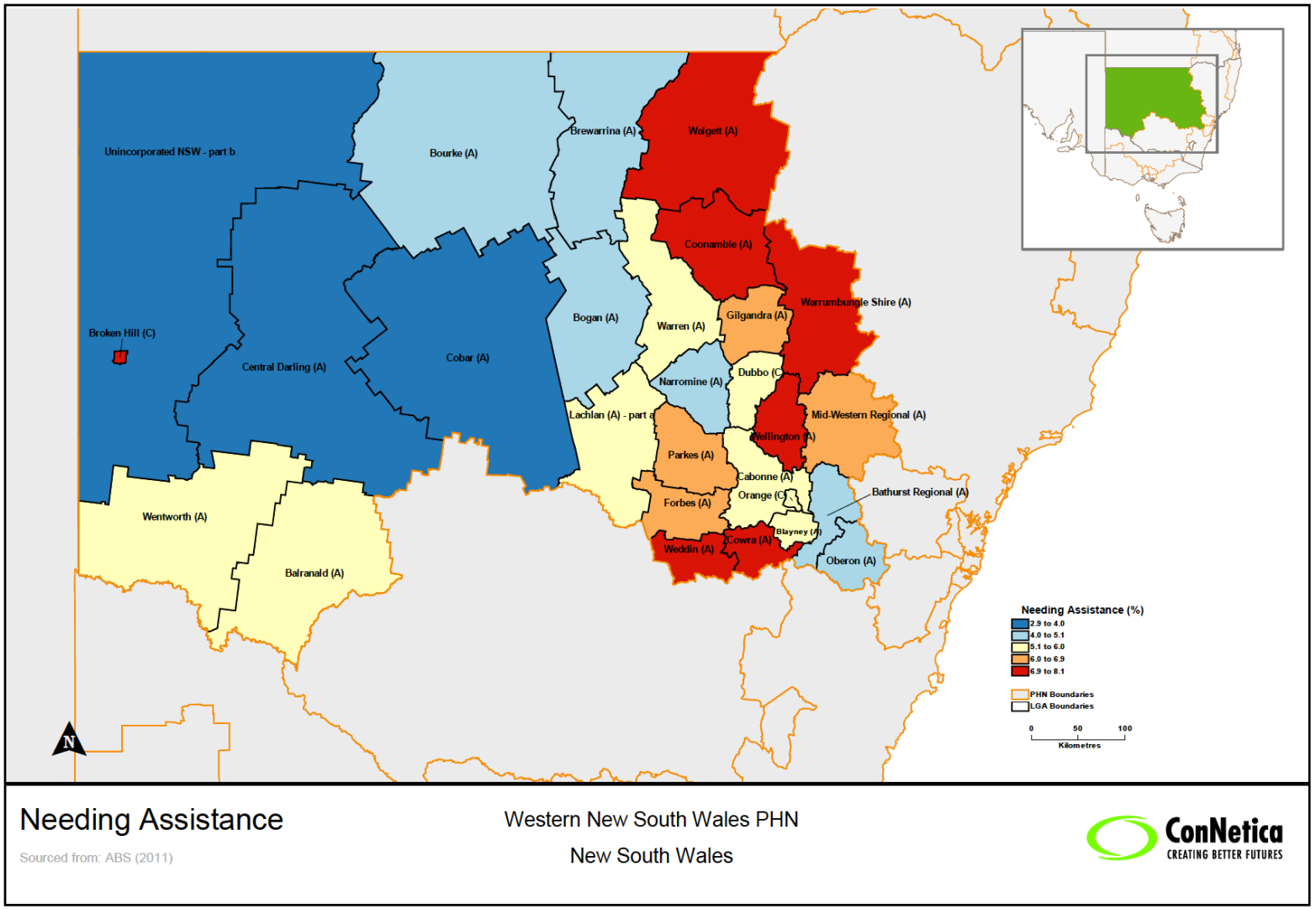


FIGURE 16 NEEDING ASSISTANCE IN THE WNSW PHN REGION

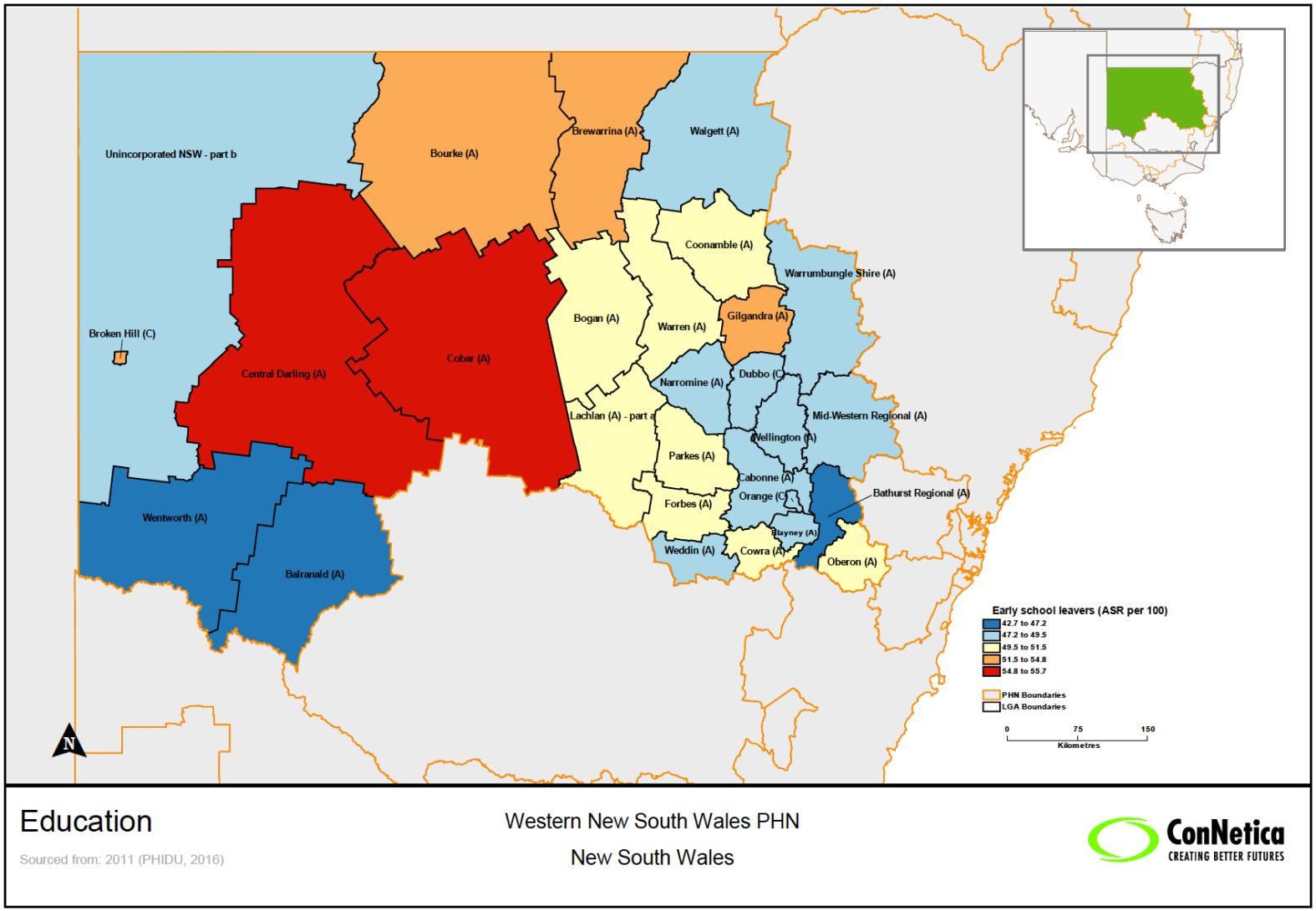


FIGURE 17 EARLY SCHOOL LEAVERS IN THE WNSW PHN REGION

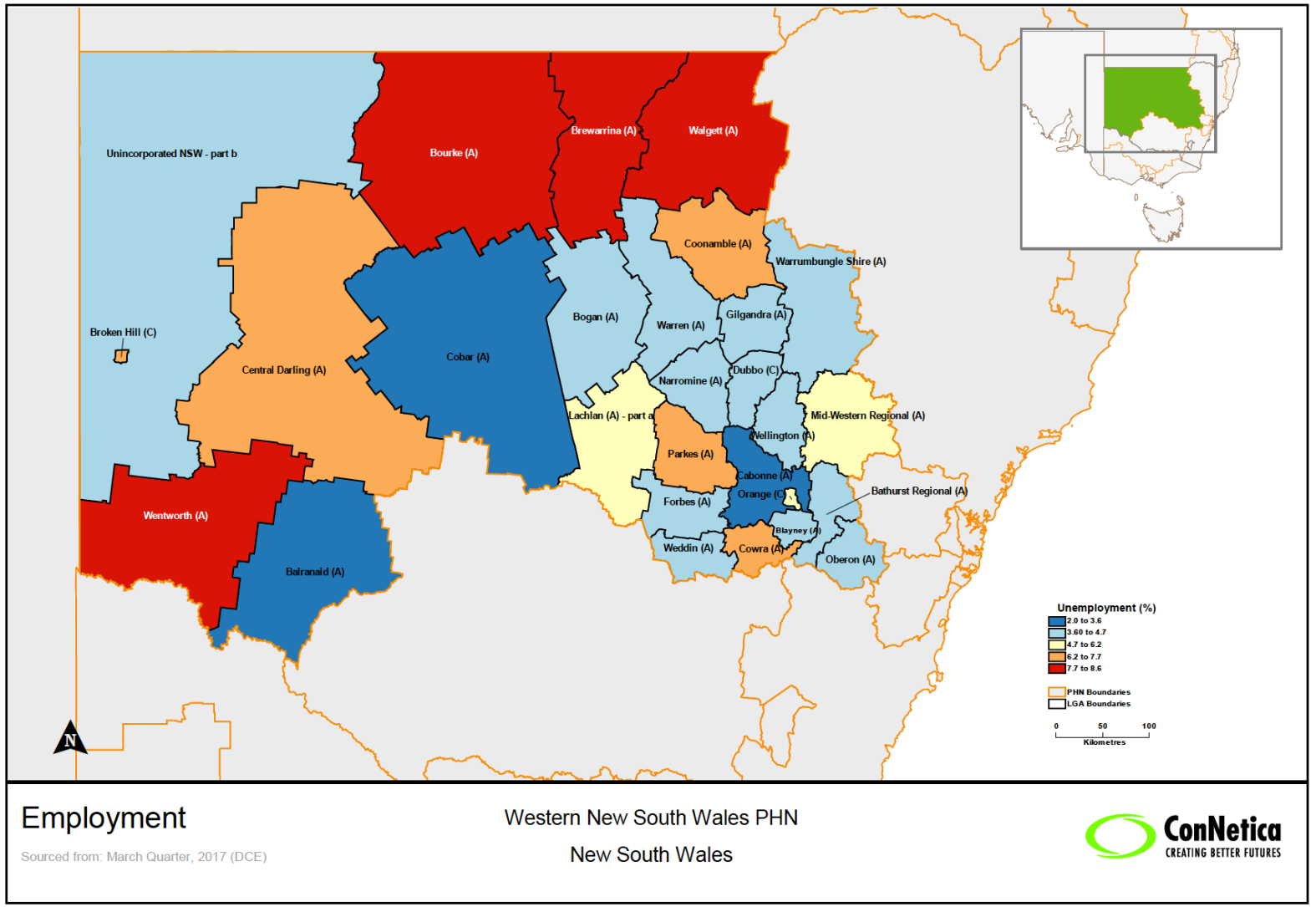


FIGURE 18 UNEMPLOYMENT IN THE WNSW PHN REGION

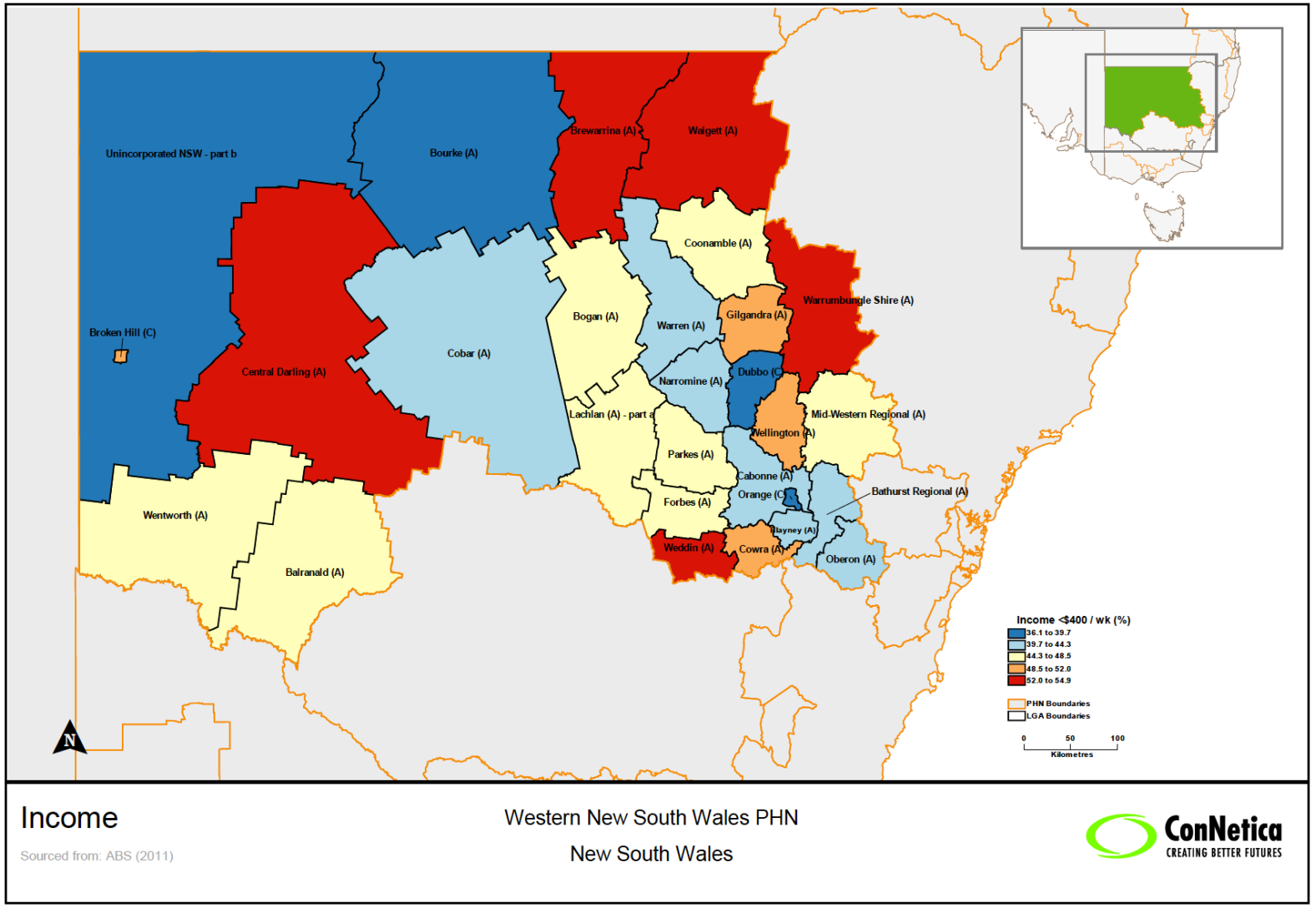


FIGURE 19 INCOME IN THE WNSW PHN REGION

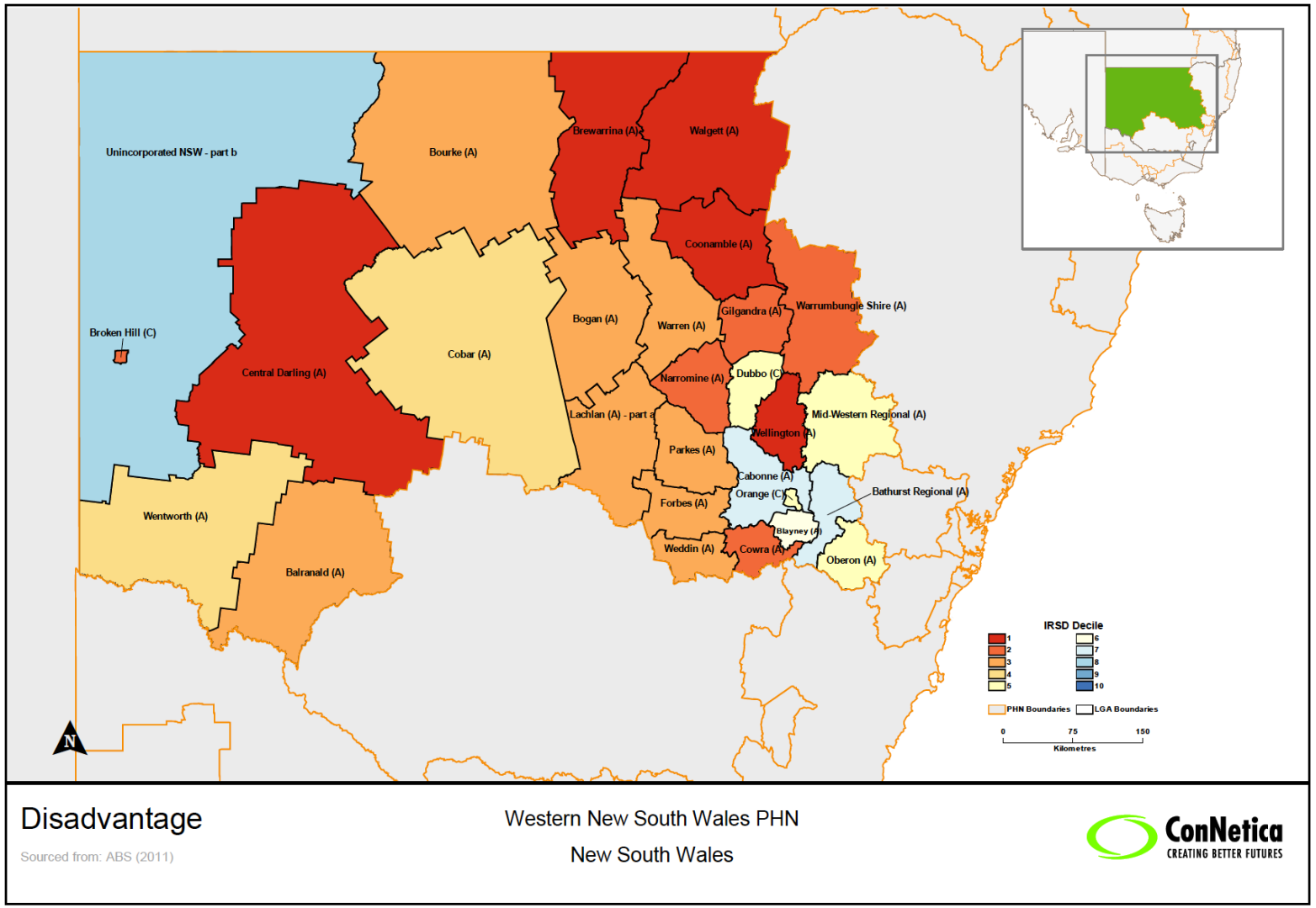


FIGURE 20 IRSD IN THE WNSW PHN REGION

4.4 Chronic Disease Risk Factors

Chronic disease risk factors related to lifestyle choices (e.g. tobacco and excess alcohol consumption, lack of exercise and poor diet) are well established as precursors to chronic disease (Dietz et al, 2016).

The promotion of healthy lifestyle behaviours has been a key focus of preventative health and public health promotion for a number of years, and aims to target the factors beyond genetics and social inequalities that may contribute to chronic disease (Halpin et al, 2017). Details of the chronic risk factors that are mapped in this atlas can be found in Table 9. In Table 10 the statistics related to chronic disease risk factors in the WNSW PHN region are presented.

TABLE 9 CHRONIC DISEASE RISK FACTORS EXAMINED

Indicator	Description	Calculation
Current Smokers	The data on which the estimates are based are self-reported responses, reported to interviewers in the 2014–15 National Health Survey (NHS). A current smoker is an adult who reported at the time of interview that they smoked manufactured (packet) cigarettes, roll-your-own cigarettes, cigars, and/or pipes at least once per week. It excludes chewing tobacco and smoking of non-tobacco products.	Estimated number of people aged over 18 years who were current smokers. Indirectly age-standardised rate per 100 population.
>2 Standard Alcoholic Drinks per Day on Average	The data on which the estimates are based are self-reported responses, reported to interviewers in the 2014–15 NHS. The National Health and Medical Research Council guidelines for lifetime risk state that, for healthy men and women, drinking no more than two standard drinks on any day reduces the lifetime risk of harm from alcohol-related disease or injury.	Estimated number of people aged 15 years and over who consumed more than two standard alcoholic drinks per day on average. Indirectly age-standardised rate per 100 population.
Overweight Persons	The Body Mass Index (BMI) (or Quetelet's index) is a measure of relative weight based on an individual's mass and height.	Estimated number of people aged 18 years and over who were overweight (but not obese). The height (cm) and weight (kg) of respondents, as measured during the NHS interview, were used to calculate the BMI for those who were overweight (but not obese) where a person's BMI was between 25 and 30. Indirectly age-standardised rate per 100 population.
Obese Persons	The Body Mass Index (BMI) (or Quetelet's index) is a measure of relative weight based on an individual's mass and height.	Estimated number of people aged 18 years and over who were obese. The height (cm) and weight (kg) of respondents, as measured during the NHS interview, were used to calculate the BMI for those who were obese where a person's BMI was between 30 or greater. Indirectly age-standardised rate per 100 population.
>18 Low or No Exercise in Previous Week	The data on which the estimates were based are self-reported responses, reported to interviewers in the 2014–15 NHS. The modelled estimates were based on data for exercise undertaken for fitness, sport or recreation in the week prior to being interviewed.	Estimated number of people aged 18 years or over who undertook no or low exercise in the week prior to the survey. Indirectly age-standardised rate per 100 population. Exercise level was calculated 'Duration of exercise (minutes) x Intensity factor (walking for fitness = 3.5, moderate = 5, vigorous = 7.5): low exercise refers to scores of less than 800.
Composite Risk Factors	The four risk factors making up the composite are: current smokers; consuming	Estimated number of males, females and persons aged 18 years and over with at least one of four

	alcohol at levels considered to be a high risk to health over their lifetime; obese from measured height and weight; and no or low exercise in the week prior to interview.	risk factors (current smokers, high risk alcohol, obese, no or low exercise in the previous week).

TABLE 10 CHRONIC DISEASE RISK FACTORS IN THE WNSW PHN REGION

LGA	Current Smokers (ASR per 100)*	>2 Standard Alcoholic Drinks per Day on Average (ASR per 100)*	Overweight Persons (ASR per 100)*	Obese Persons (ASR per 100)*	>18 low or no exercise in previous week (ASR per 100)*	Composite Risk Factors (ASR per 100)*
Balranald	22.6⇧	20.1⇧	34.5⇩	39.2⇧	76.6⇧	82.6
Bathurst	18.0⇧	20.7⇧	33.9⇩	36.7⇧	69.3⇧	80.7⇩
Blayney	21.0⇧	25.6⇧	32.4⇩	42.6⇧	73.8⇧	89.0⇧
Bogan	25.4⇧	20.7⇧	34.5⇩	42.2⇧	78.5⇧	85.8⇧
Bourke	NP	NP	NP	NP	NP	NP
Brewarrina	NP	NP	NP	NP	NP	NP
Broken Hill	23.7⇧	15.0⇩	32.7⇩	37.2⇧	74.3⇧	84.4⇧
Cabonne	17.6⇧	19.6⇧	34.3⇩	38.6⇧	72.9⇧	84.4⇧
Central Darling	23.7⇧	15.0⇩	32.7⇩	37.2⇧	74.3⇧	84.4⇧
Cobar	25.4⇧	20.7⇧	34.5⇩	42.2⇧	78.5⇧	85.8⇧
Coonamble	25.4⇧	20.7⇧	34.5⇩	42.2⇧	78.5⇧	85.8⇧
Cowra	24.4⇧	18.7⇧	32.7⇩	36.2⇧	74.1⇧	85.2⇧
Dubbo	19.3⇧	21.2⇧	32.6⇩	39.7⇧	70.0⇧	81.9⇩
Forbes	21.6⇧	19.9⇧	34.4⇩	42.5⇧	77.8⇧	87.1⇧
Gilgandra	23.5⇧	18.5⇧	33.2⇩	40.9⇧	78.1⇧	84.4⇧
Lachlan (a)	21.6⇧	19.9⇧	34.4⇩	42.5⇧	77.9⇧	87.2⇧
Mid-Western	24.2⇧	19.7⇧	34.1⇩	36.6⇧	71.8⇧	84.5⇧
Narromine	23.5⇧	18.5⇧	33.2⇩	40.9⇧	78.1⇧	84.4⇧
Oberon	21.3⇧	23.7⇧	34.3⇩	40.5⇧	75.3⇧	88.7⇧
Orange	18.2⇧	19.2⇧	33.3⇩	37.8⇧	71.4⇧	83.6⇧
Parkes	24.3⇧	18.8⇧	33.3⇩	38.7⇧	73.1⇧	84.7⇧
Walgett	NP	NP	NP	NP	NP	NP
Warren	25.3⇧	20.5⇧	34.4⇩	42.1⇧	78.5⇧	85.7⇧
Warrumbungle	23.6⇧	18.8⇧	33.3⇩	40.3⇧	77.1⇧	84.4⇧
Weddin	20.8⇧	20.8⇧	34.6⇩	40.0⇧	78.4⇧	86.6⇧
Wellington	27.1⇧	18.4⇧	32.7⇩	43.9⇧	73.7⇧	83.5⇧
Wentworth	22.6⇧	20.1⇧	34.5⇩	39.2⇧	76.6⇧	82.6
Unincorp. NSW	NP	NP	NP	NP	NP	NP
WNSW PHN	**21.2**	**19.7**	**33.5**	**38.9**	**73.0**	**83.84**
NSW	16.0	16.7	35.1	28.2	67.1	82.6
Australia	16.1	16.7	35.5	27.9	66.3	81.7

Sourced from: *2014-15 (PHIDU, 2017)

Chronic Disease Risk Indicators

Only three LGAs had lower chronic disease risk factor estimates than the state and national rates when looking at all indicators. Broken Hill and Central Darling both had lower rates of excessive alcohol consumption (15 per 100 ASR), lower than the state and national rates of 16.7. The LGA of Bathurst has a lower composite risk factor score (80.7) compared to state (82.6) and national (81.7) scores.

The Dubbo LGA scores largely reflect the WNSW PHN catchment rates, with slightly lower estimates of current smoker and low activity levels, and slightly higher estimates of excessive alcohol consumption and obese population.

In Coonamble, risk factor indicators are consistently higher than the PHN, state and national estimates, particularly concerning are rates of smoking, obese persons and low activity levels, with activity levels being the poorest performing indicator within the WNSW PHN region. These rates are reflected in a composite risk factor score of 85.8. (Figure 21 to Figure 26).

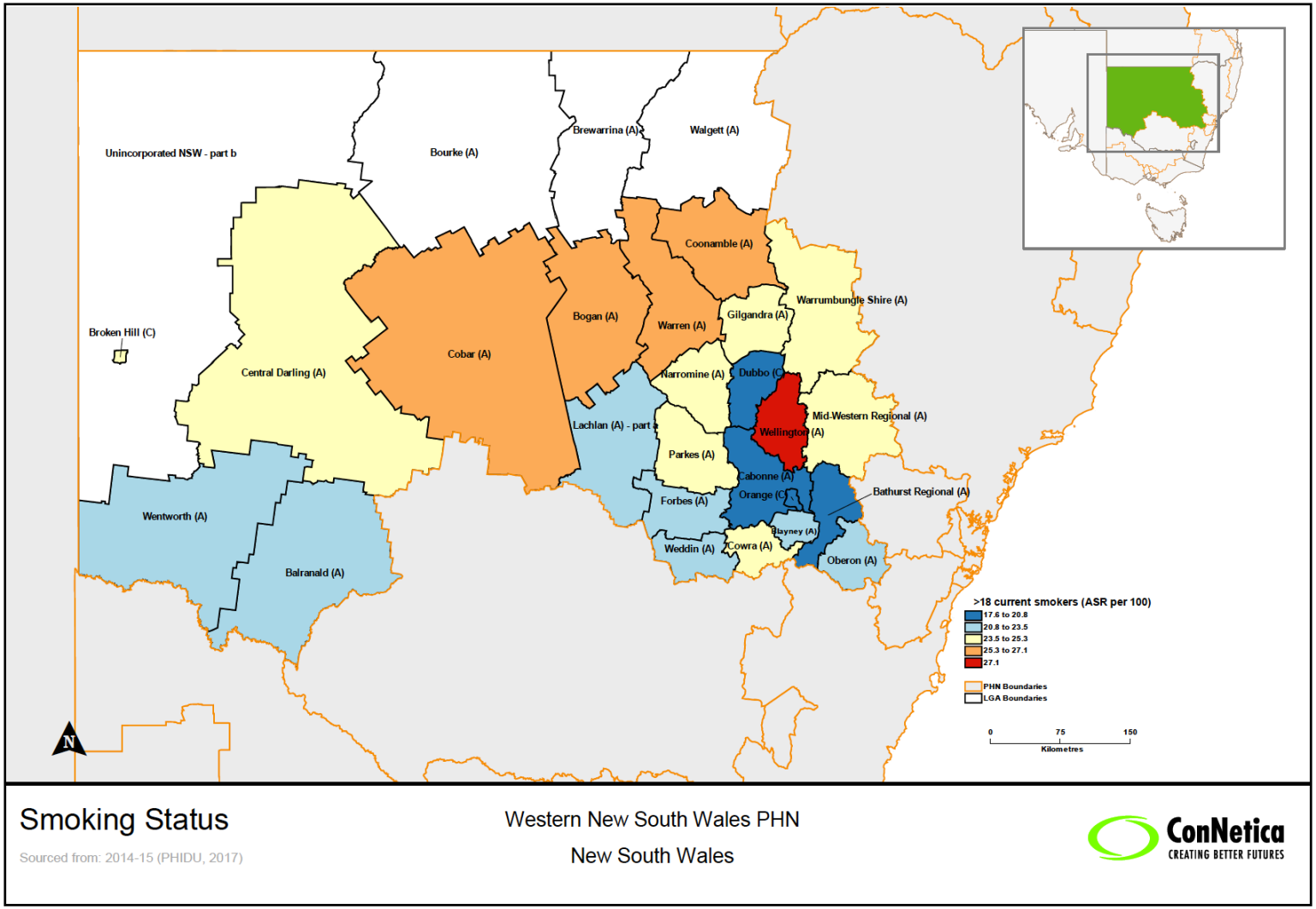


FIGURE 21 ESTIMATED CURRENT SMOKERS IN THE WNSW PHN REGION

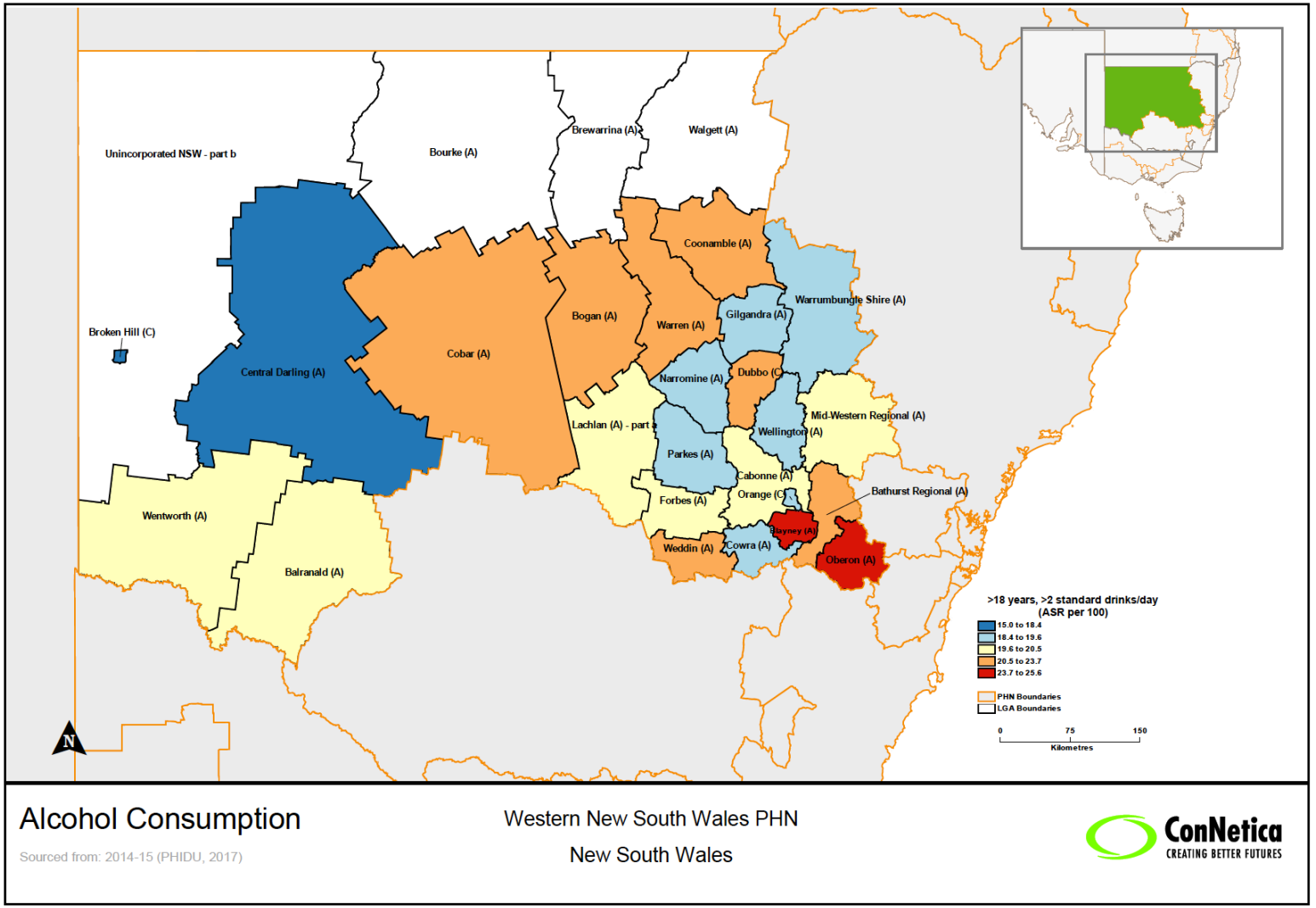


FIGURE 22 ESTIMATED >2 STANDARD ALCOHOLIC DRINKS PER DAY IN THE WNSW PHN REGION

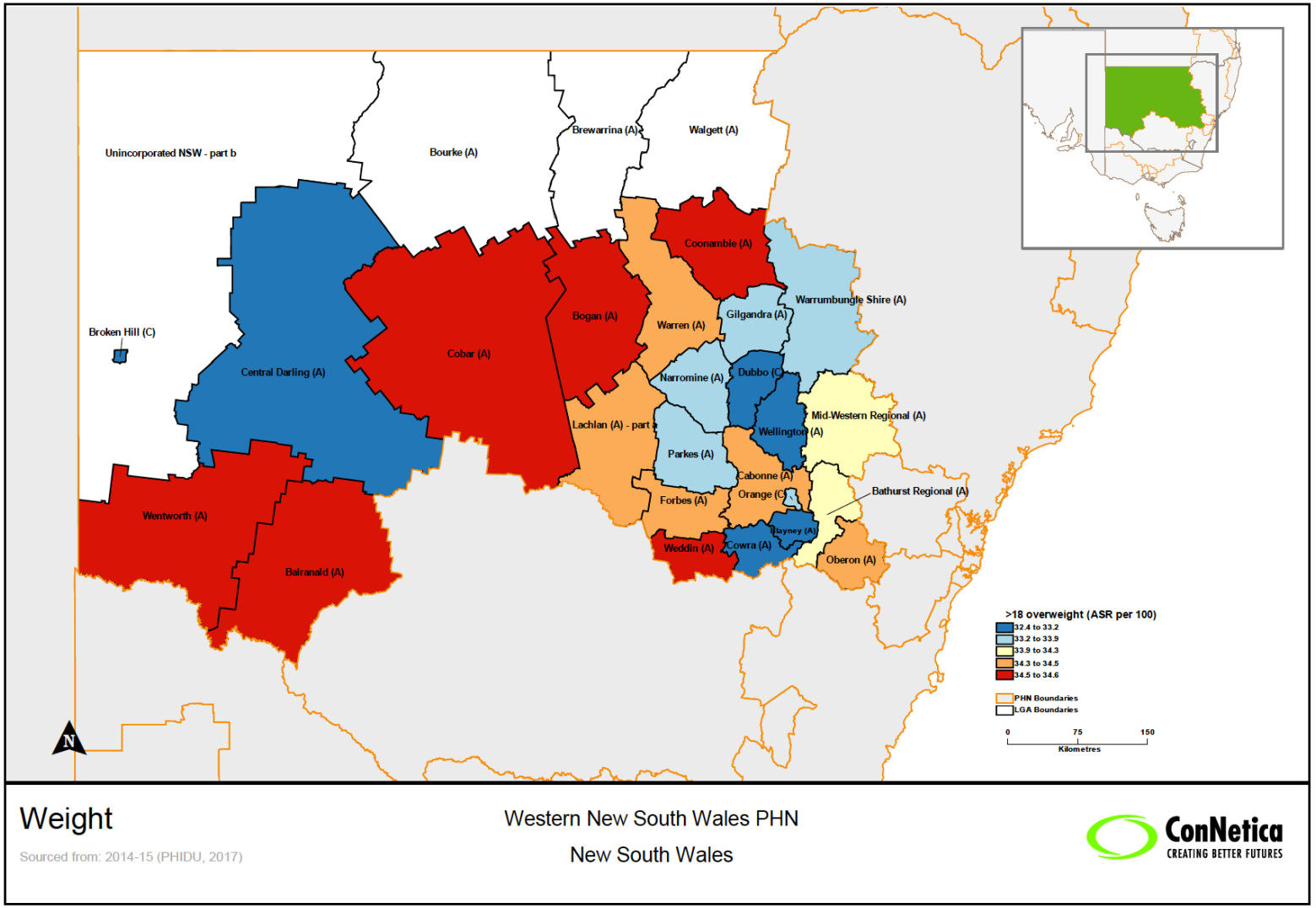


FIGURE 23 ESTIMATED OVERWEIGHT PERSONS IN THE WNSW PHN REGION

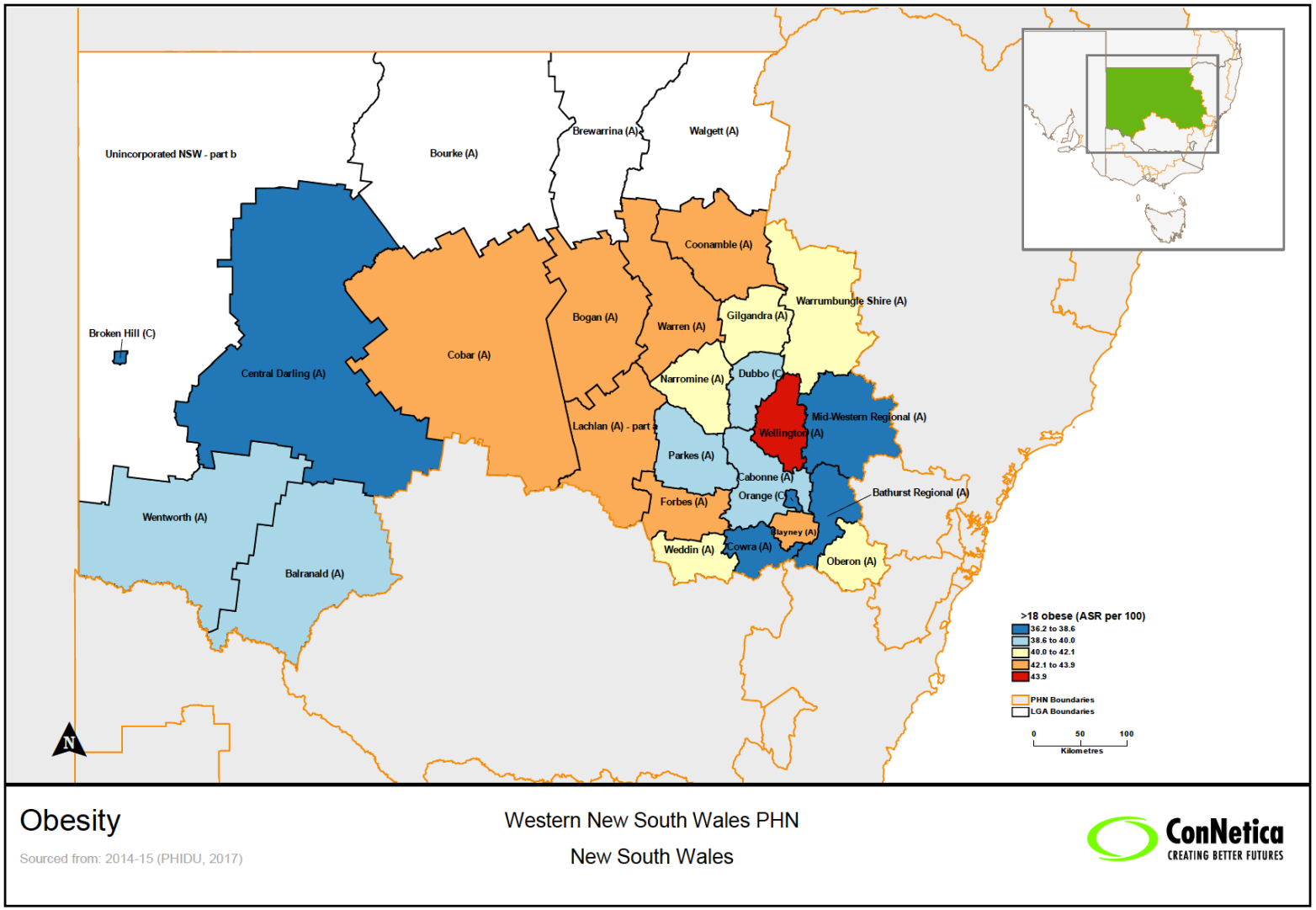


FIGURE 24 ESTIMATED OBESE PERSONS IN THE WNSW PHN REGION

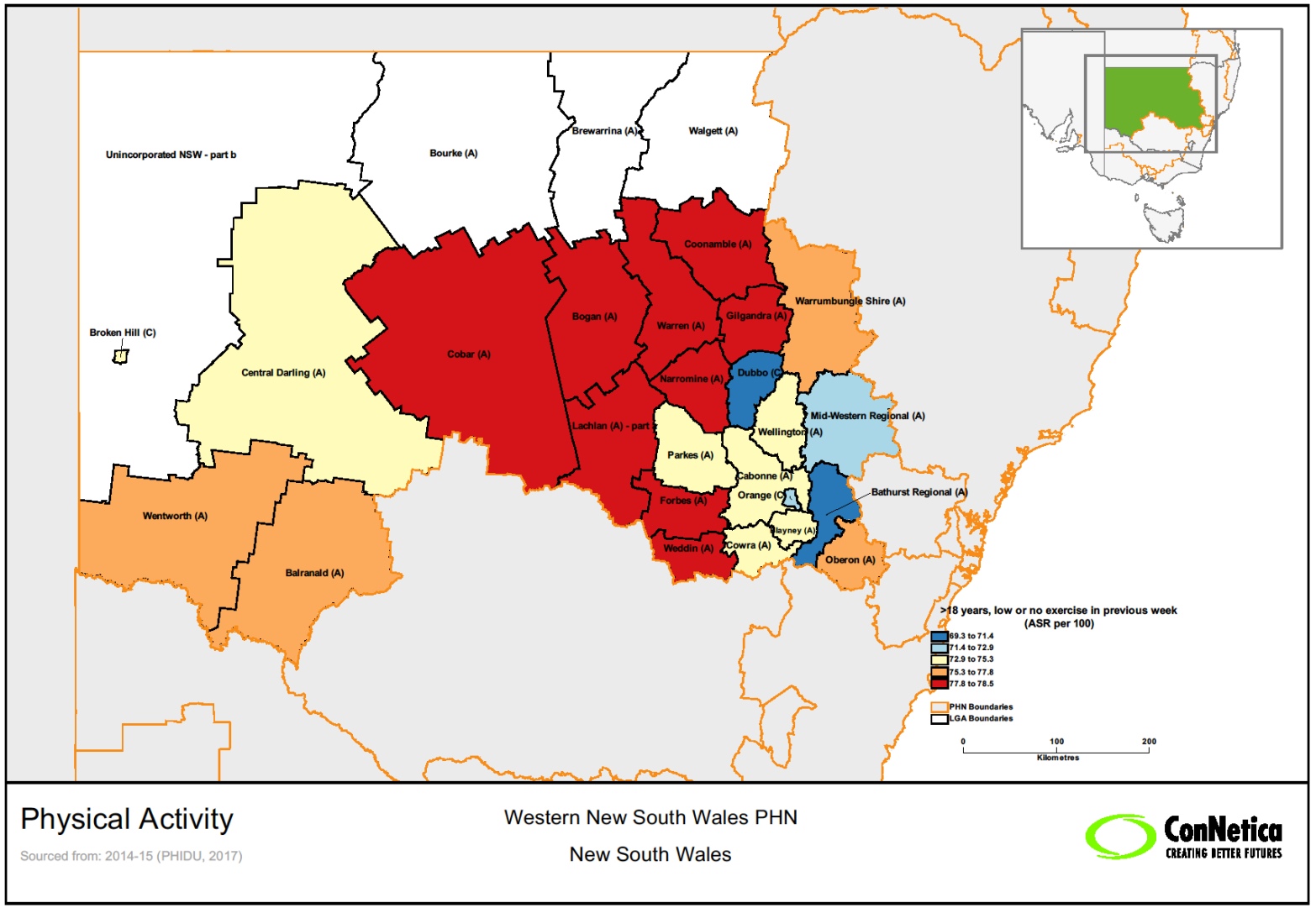


FIGURE 25 ESTIMATED LOW EXERCISE IN THE WNSW PHN REGION

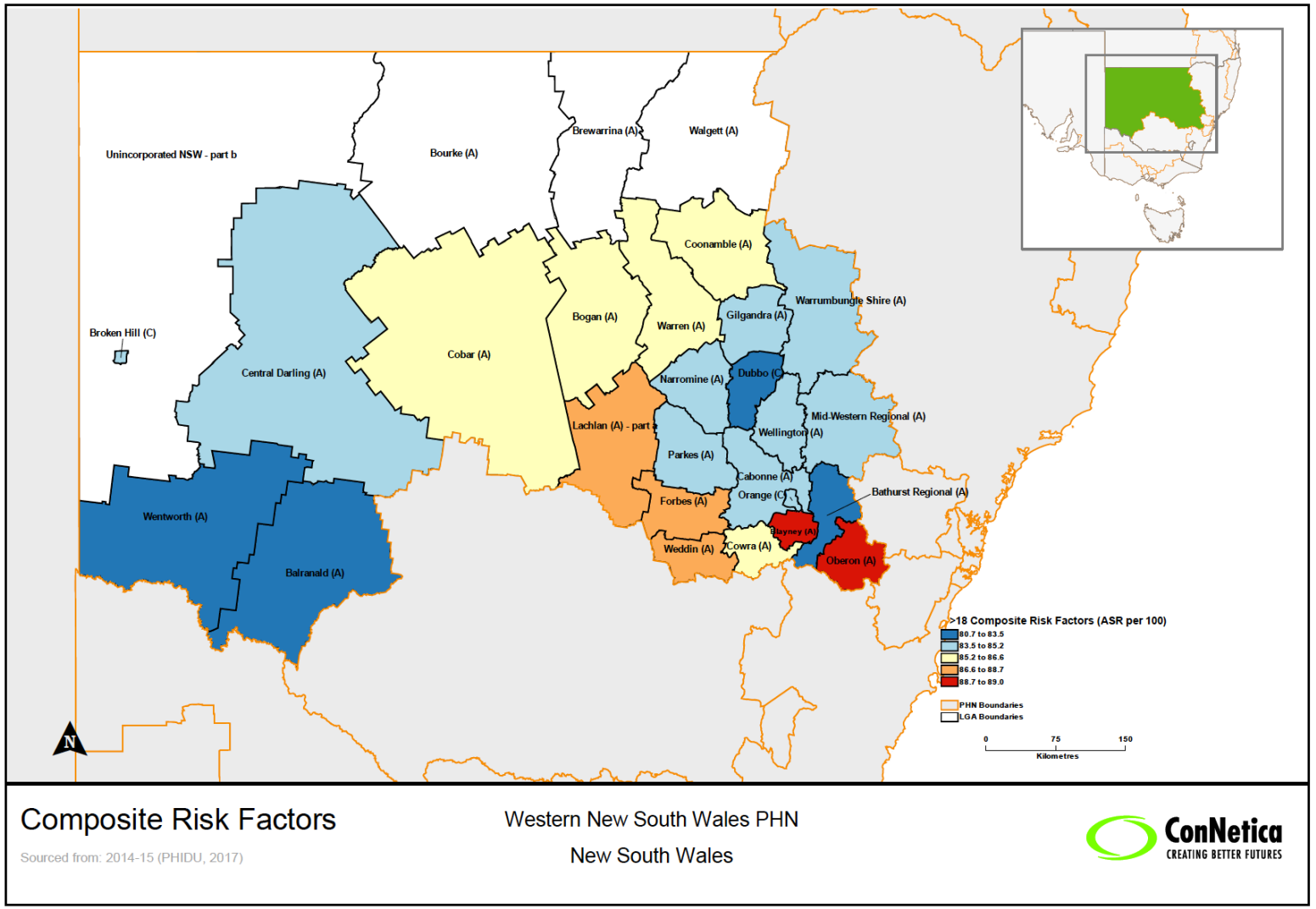


FIGURE 26 COMPOSITE CHRONIC DISEASE RISK FACTORS IN THE WNSW PHN REGION

4.5 Chronic Disease Indicators

The chronic disease indicators in this atlas aim to provide a snapshot of estimated chronic disease rates in the WNSW PHN region. Specifically, this atlas has mapped diabetes mellitus, high blood cholesterol, hypertensive disease and chronic obstructive pulmonary disease across the WNSW PHN region. Table 11 details these indicators and their associated calculations. Table 12 presents the chronic disease indicators for the WNSW PHN area, state and national areas.

TABLE 11 CHRONIC DISEASE INDICATORS EXAMINED

Indicator	Description	Calculation
Diabetes Mellitus	The prevalence of diabetes mellitus was measured by a glycosylated haemoglobin test (commonly referred to as HbA1c), derived from tests on blood samples from volunteering participants selected as part of the Australian Health Survey (AHS): people with an HbA1c level of greater than or equal to 6.5% were recorded as having diabetes mellitus (6.5% is the World Health Organization's recommended diagnostic cut-off point for diabetes mellitus).	Estimated population, aged 18 years and over with diabetes mellitus. Indirectly age-standardised rate per 100 population.
High Blood Cholesterol	Total cholesterol results were obtained for selected people aged 12 years and over, who agreed to participate in the NHMS component of the AHS and provided a blood sample. The total cholesterol test measures the combined amount of lipid (fat) components circulating in the blood at the time of the test. Fasting was not required. In the NHMS, the following definition for high serum total cholesterol was used: abnormal total cholesterol indicated by levels ≥ 5.5 mmol/L. This was based on epidemiological data and publications of major clinical trials, and advice from the National Heart Foundation Australia and the Cardiac Society of Australia and New Zealand. The data therefore refer to people with a total blood cholesterol level ≥ 5.5 mmol/L.	Estimated population, aged 18 years and over with high blood cholesterol. Indirectly age-standardised rate per 100 population.
Hypertensive Disease	In the AHS, people with hypertensive disease are defined as those persons who reported having been told by a doctor or nurse that they had hypertension and that it was current and long-term; that is, their condition was current at the time of interview and had lasted, or was expected to last, 6 months or more.	Estimated population with hypertensive disease as a current, long term condition. Indirectly age-standardised rate per 100 population.
COPD	In the AHS, these data refer to respondents ever having been told by a doctor or nurse that they have bronchitis or emphysema (COPD); or not diagnosed but who consider their condition to be current and long-term. A long-term condition is defined as a condition that is current and has lasted, or is expected to last, for 6 months or more.	Estimated population with COPD. Indirectly age-standardised rate per 100 population.

TABLE 12 CHRONIC DISEASE INDICATORS FOR THE WNSW PHN REGION

LGA	Diabetes Mellitus (ASR per 100)*	High Blood Cholesterol (ASR per 100)*	Hypertensive Disease (ASR per 100)*	COPD (ASR per 100)*
Balranald	5.0⇩	32.2⇩	10.5	2.7⇧
Bathurst	4.6⇩	34.9⇧	10.7⇧	3.0⇧
Blayney	4.6⇩	34.7⇧	11.0	2.9⇧
Bogan	4.9⇩	34.9⇧	10.6⇧	2.9⇧
Bourke	NP	NP	NP	NP
Brewarrina	NP	NP	NP	NP
Broken Hill	5.7⇩	31.3⇩	10.2⇩	3.3⇧
Cabonne	4.4⇩	33.7⇧	10.9⇧	2.7⇧
Central Darling	5.7⇩	31.3⇩	10.2⇩	3.3⇧
Cobar	4.9⇩	34.9⇧	10.6⇧	2.9⇧
Coonamble	4.9⇩	34.9⇧	10.6⇧	2.9⇧
Cowra	5.1⇩	35.0⇧	10.3⇩	3.1⇧
Dubbo	4.9⇩	32.2⇩	10.5	2.9⇧
Forbes	4.7⇩	34.9⇧	10.2⇩	2.9⇧
Gilgandra	5.1⇩	33.6⇧	10.5	2.8⇧
Lachlan (a)	4.7⇩	35.0⇧	10.2⇩	2.9⇧
Mid-Western	4.8⇩	33.2⇧	10.5	3.0⇧
Narromine	5.1⇩	33.6⇧	10.5	2.8⇧
Oberon	4.7⇩	32.2⇩	10.8⇧	2.8⇧
Orange	4.6⇩	32.7⇧	11.0⇧	2.9⇧
Parkes	4.8⇩	31.7⇩	10.4⇩	3.0⇧
Walgett	NP	NP	NP	NP
Warren	4.9⇩	34.8⇧	10.6⇧	2.9⇧
Warrumbungle	5.0⇩	33.6⇧	10.5	2.8⇧
Weddin	4.6⇩	33.9⇧	10.4⇩	2.9⇧
Wellington	6.0⇧	34.6⇧	10.9⇧	3.1⇧
Wentworth	5.0⇩	32.2⇩	10.5	2.7⇧
Unincorp. NSW	NP	NP	NP	NP
WNSW PHN	**5.0**	**33.3**	**10.6**	**2.9**
NSW	5.8	32.4	10.5	2.6
Australia	5.4	32.8	10.2	2.4

Sourced from: *2011-12 (PHIDU, 2016)

Chronic disease indicators across the WNSW PHN region are generally closely aligned with the state and national estimates. The Cabonne LGA has estimates lower than the WNSW PHN region, state and national estimates in rates of Diabetes Mellitus and COPD, whilst Broken Hill and Central Darling estimates are both lower than the WNSW PHN region, state and national estimates for high blood pressure and hypertensive disease.

Both Dubbo and Coonamble record estimates closely aligned with the WNSW PHN region, state and national rates, with no exceptionally high or low estimates for the chronic disease indicators presented. (Figure 27 to Figure 30).

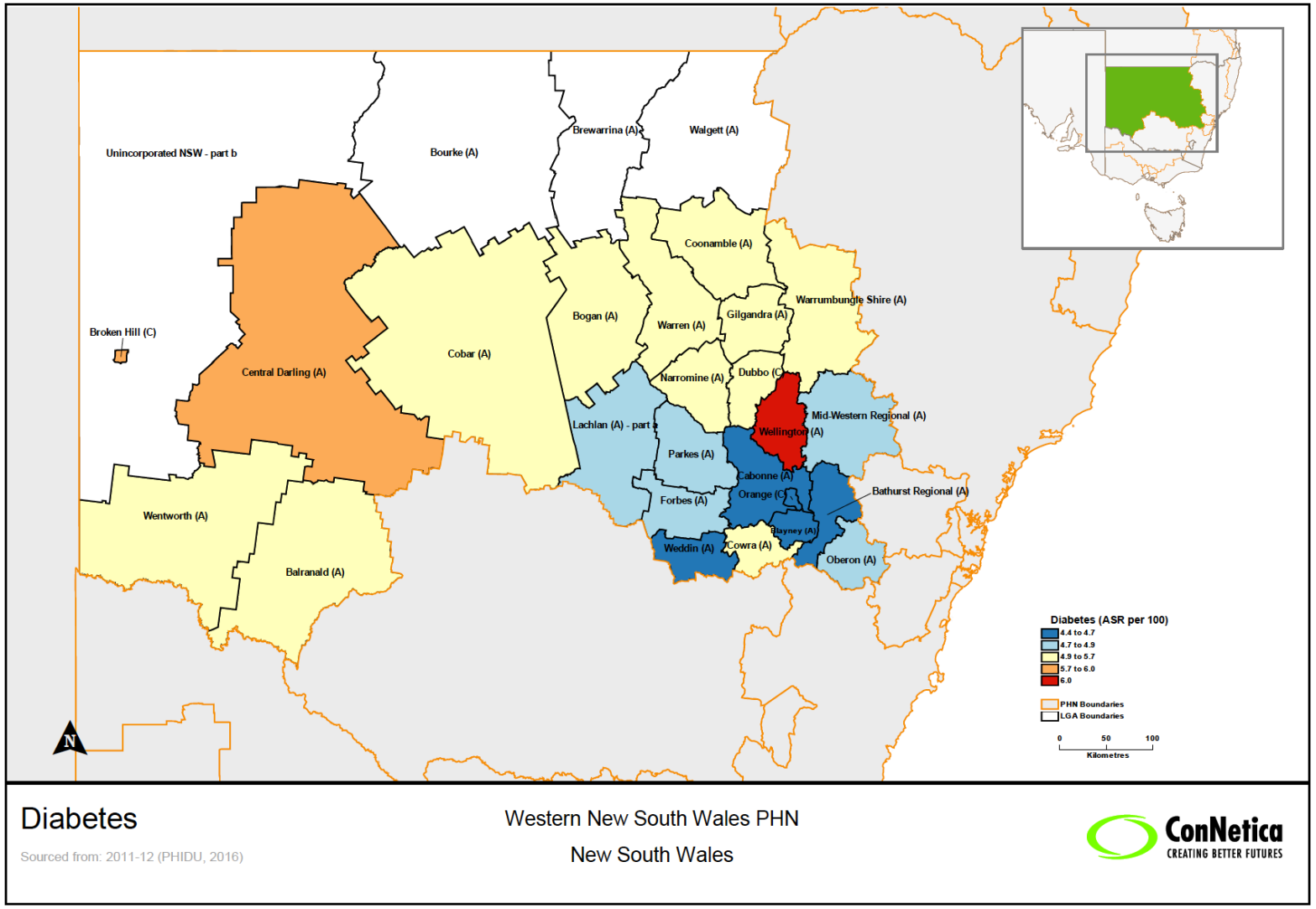


FIGURE 27 ESTIMATED DIABETES MELLITUS IN THE WNSW PHN REGION

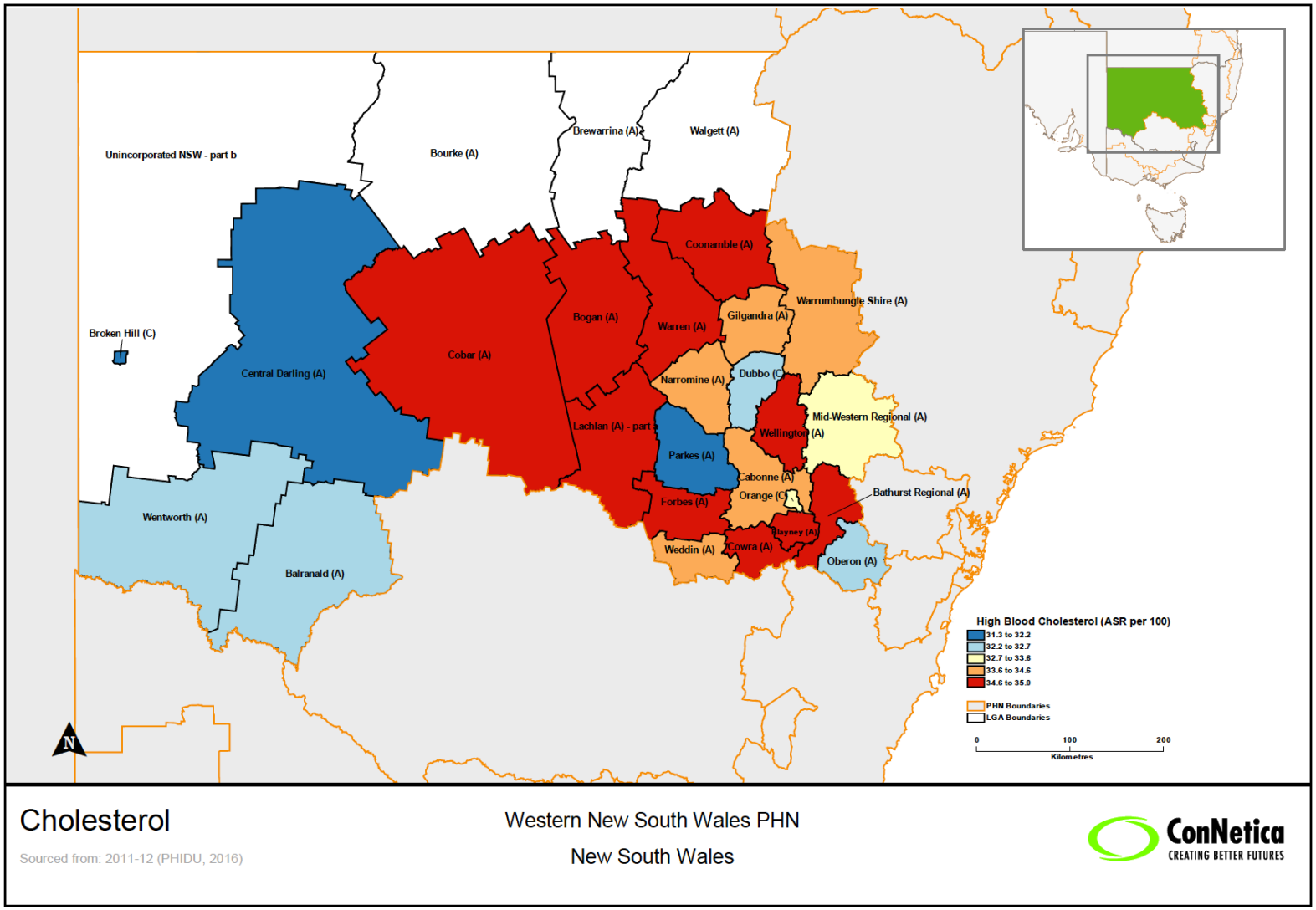


FIGURE 28 ESTIMATED HIGH BLOOD CHOLESTEROL

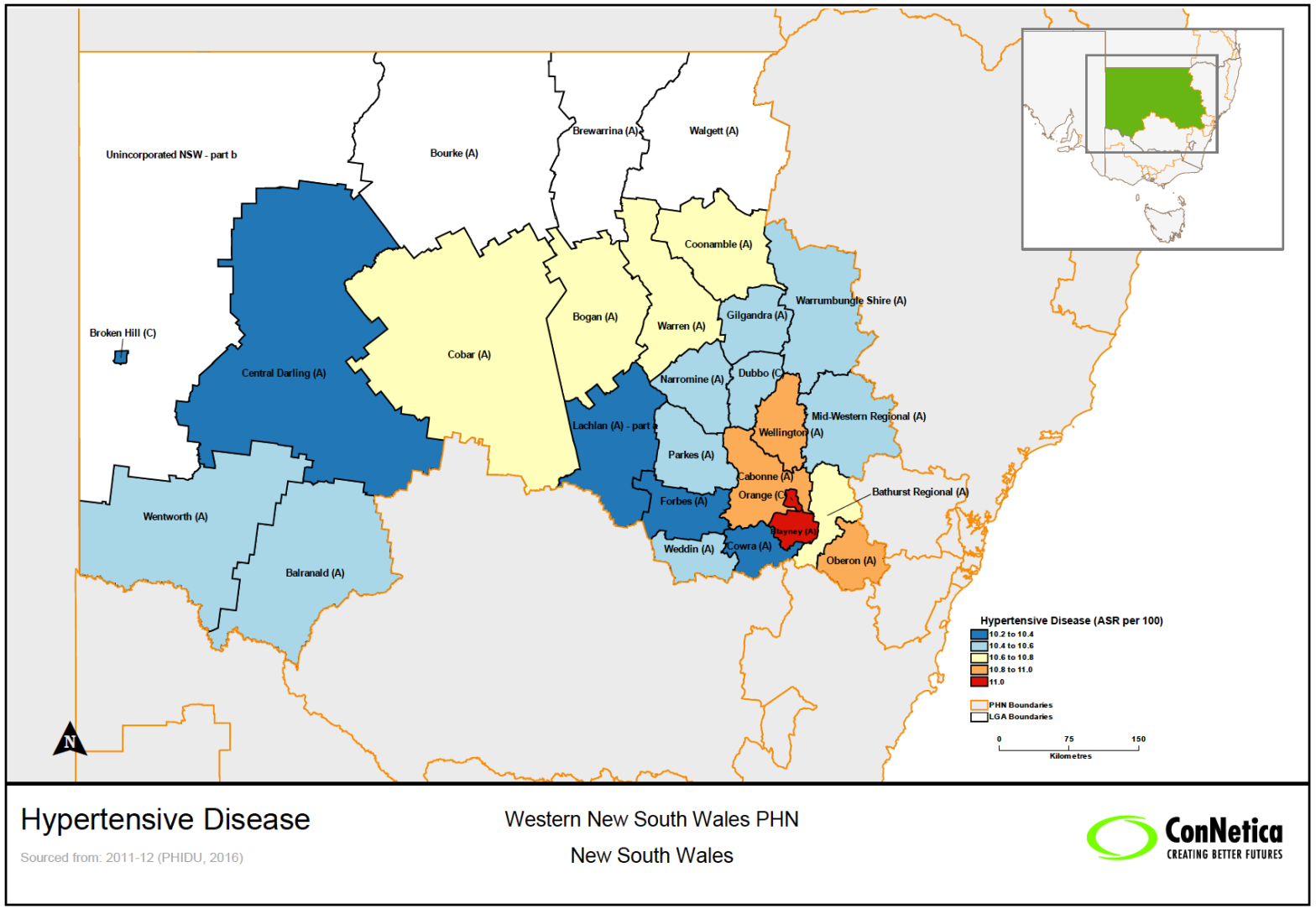


FIGURE 29 ESTIMATED HYPERTENSIVE DISEASE IN THE WNSW PHN REGION

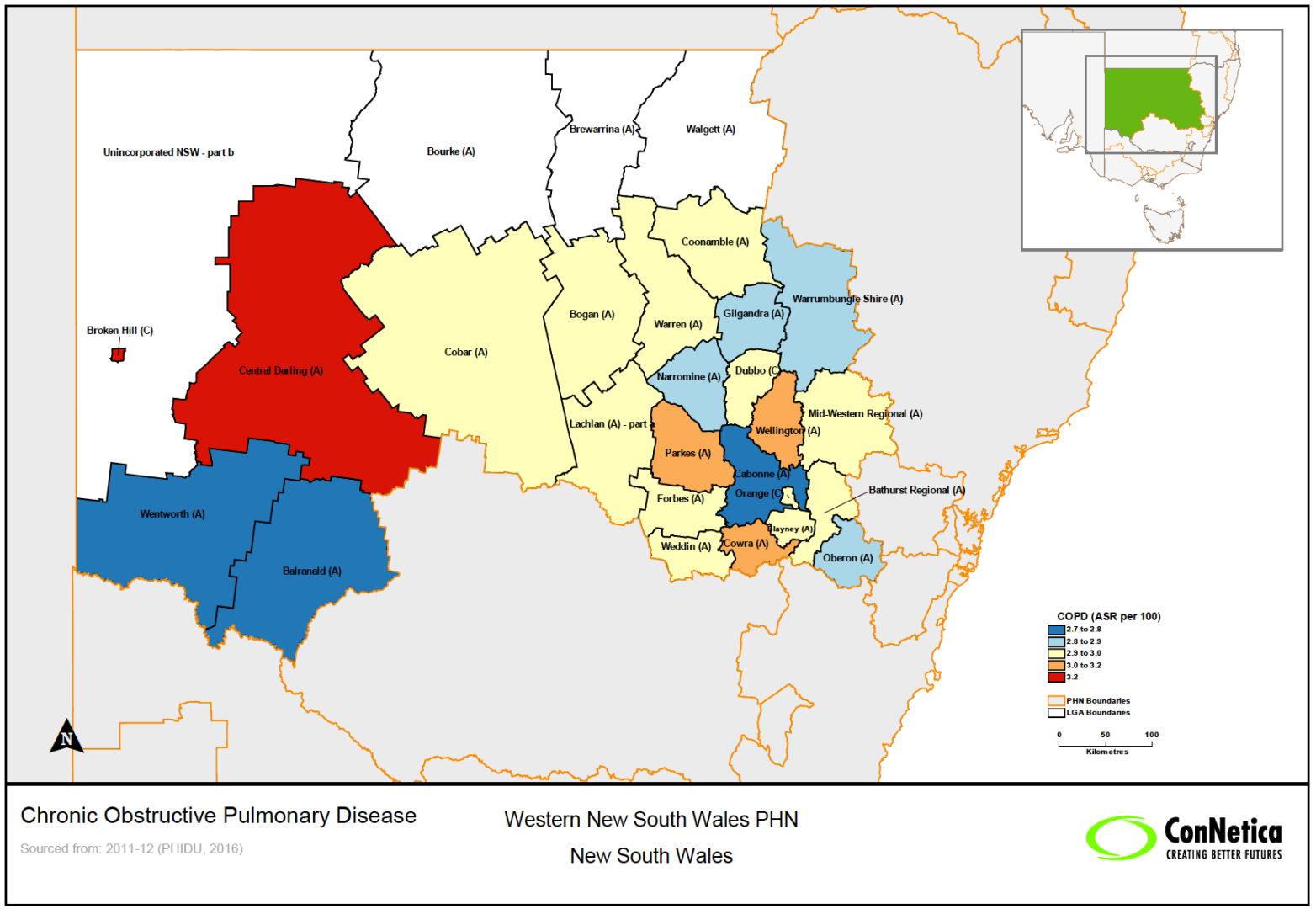


FIGURE 30 ESTIMATED COPD IN THE WNSW PHN REGION

4.6 Premature Mortality from Chronic Disease

Completing this section of this atlas is the premature mortality data related to five chronic disease estimates: circulatory disease, ischemic heart disease, cerebrovascular disease, respiratory disease and COPD. The description and calculation of these estimates are found in Table 13. Table 14 presents these premature mortality statistics by LGA, WNSW PHN region, state and national areas.

TABLE 13 PREMATURE MORTALITY FROM CHRONIC DISEASE EXAMINED IN THE WNSW PHN REGION

Indicator	Description	Calculation
Circulatory Diseases	Premature mortality from selected chronic diseases. For deaths data released since 2007, the ABS has applied a staged approach to the coding of cause of death which affects the number of records available for release at any date, with data being released as preliminary, revised, or final, This release is comprised of preliminary data for 2014, revised data for 2013 and final data for 2010, 2011 and 2012.	For all indicators, the data presented are the average annual indirectly age-standardised rates per 100,000 total population (aged 0 to 74 years); and/or indirectly age-standardised ratios, based on the Australian standard.
Ischemic Heart Disease		
Cerebrovascular Disease		
Respiratory Disease		
COPD		

TABLE 14 PREMATURE MORTALITY FROM CHRONIC ILLNESS

LGA	Circulatory Diseases (ASR per 100,000)*	Ischemic heart Disease (ASR per 100,000)*	Cerebrovascular Disease (ASR per 100,000)*	Respiratory System Disease (ASR per 100,000)*	COPD (ASR per 100,000)*
Balranald	46.2⇧	NP	NP	NP	NP
Bathurst	56.6⇧	24.1⇧	13.5⇧	21.9⇧	12.6⇧
Blayney	49.1⇧	30.9⇧	NP	22.8⇧	NP
Bogan	79.1⇧	NP	NP	31.7⇧	31.0⇧
Bourke	166.6⇧	91.3⇧	NP	38.4⇧	NP
Brewarrina	153.3⇧	82.4⇧	NP	NP	NP
Broken Hill	75.3⇧	48.1⇧	8.3⇩	26.3⇧	12.4⇧
Cabonne	39.4⇩	18.8	8.2⇩	24.1⇧	12.9⇧
Central Darling	93.9⇧	53.1⇧	NP	NP	NP
Cobar	61.0⇧	28.2⇧	0.0⇩	NP	NP
Coonamble	85.0⇧	38.1⇧	NP	41.5⇧	32.7⇧
Cowra	57.3⇧	28.6⇧	11.3⇧	30.0⇧	24.5⇧
Dubbo	73.5⇧	25.9⇧	14.2⇧	26.3⇧	17.3⇧
Forbes	74.0⇧	29.1⇧	10.1⇧	20.0⇧	9.8⇧
Gilgandra	94.6⇧	45.5⇧	20.5⇧	20.1⇧	NP
Lachlan (a)	92.7⇧	43.7⇧	NP	39.9⇧	22.0⇧
Mid-Western	50.0⇧	20.2⇩	10.4⇧	21.4⇧	14.7⇧
Narromine	54.5⇧	23.2⇩	NP	27.6⇧	19.6⇧

Oberon	53.0⇧	36.7⇧	NP	29.6⇧	18.6⇧
Orange	58.1⇧	29.1⇧	13.6⇧	22.1⇧	12.7⇧
Parkes	71.8⇧	19.2⇩	20.4⇧	29.8⇧	24.0⇧
Walgett	118.8⇧	60.3⇧	23.0⇧	38.4⇧	22.1⇧
Warren	79.7⇧	NP	NP	32.1⇧	29.8⇧
Warrumbungle	76.7⇧	33.0⇧	10.7⇧	22.0⇧	19.4⇧
Weddin	61.7⇧	NP	NP	18.2⇧	NP
Wellington	86.5⇧	34.5⇧	15.2⇧	27.8⇧	21.5⇧
Wentworth	53.5⇧	30.9⇧	NP	18.1⇧	14.2⇧
Unincorp. NSW	NP	NP	NP	NP	NP
WNSW PHN	**66.8**	**30.0**	**12.3**	**25.3**	**16.3**
NSW	46.1	23.8	8.8	15.3	8.6
Australia	45.6	24.1	8.3	14.8	8.5

Sourced from: *2010-14 (PHIDU, 2016)

Premature mortality from chronic disease estimates are presented as age standardised rates per 100,000 population, as opposed to previous indicators which were per 100 persons. Bourke LGA has significantly higher estimates than the WNSW PHN region, state and national estimates for Circulatory Disease (166.6) and Ischemic Heart Disease (91.3). The Cabonne LGA recorded the lowest estimate for Circulatory Disease (39.4 per 100,000 population), lower than the WNSW PHN catchment, state and national estimates.

In Coonamble LGA the estimated rates for premature mortality associated with Respiratory System Disease (41.5) and COPD (32.7) are higher than the WNSW PHN region, state and national rates and are the highest of all LGAs in the WNSW PHN region.

Dubbo LGA fares worse on all premature mortality estimates when compared to PHN, state and national rates, with the exception of Ischemic Heart Disease (Figure 31 to Figure 35).

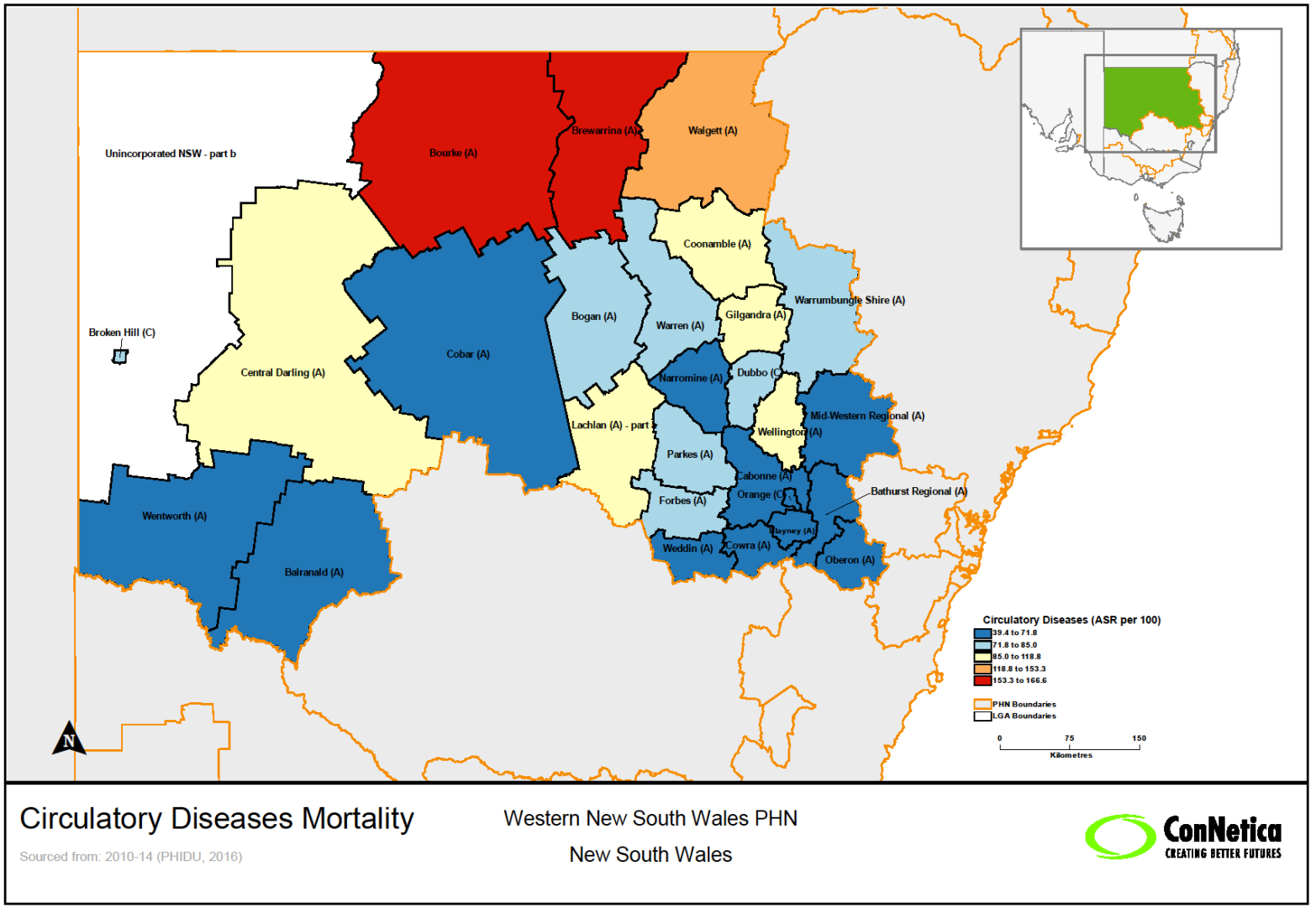


FIGURE 31 ESTIMATED CIRCULATORY DISEASES MORTALITY IN THE WNSW PHN REGION

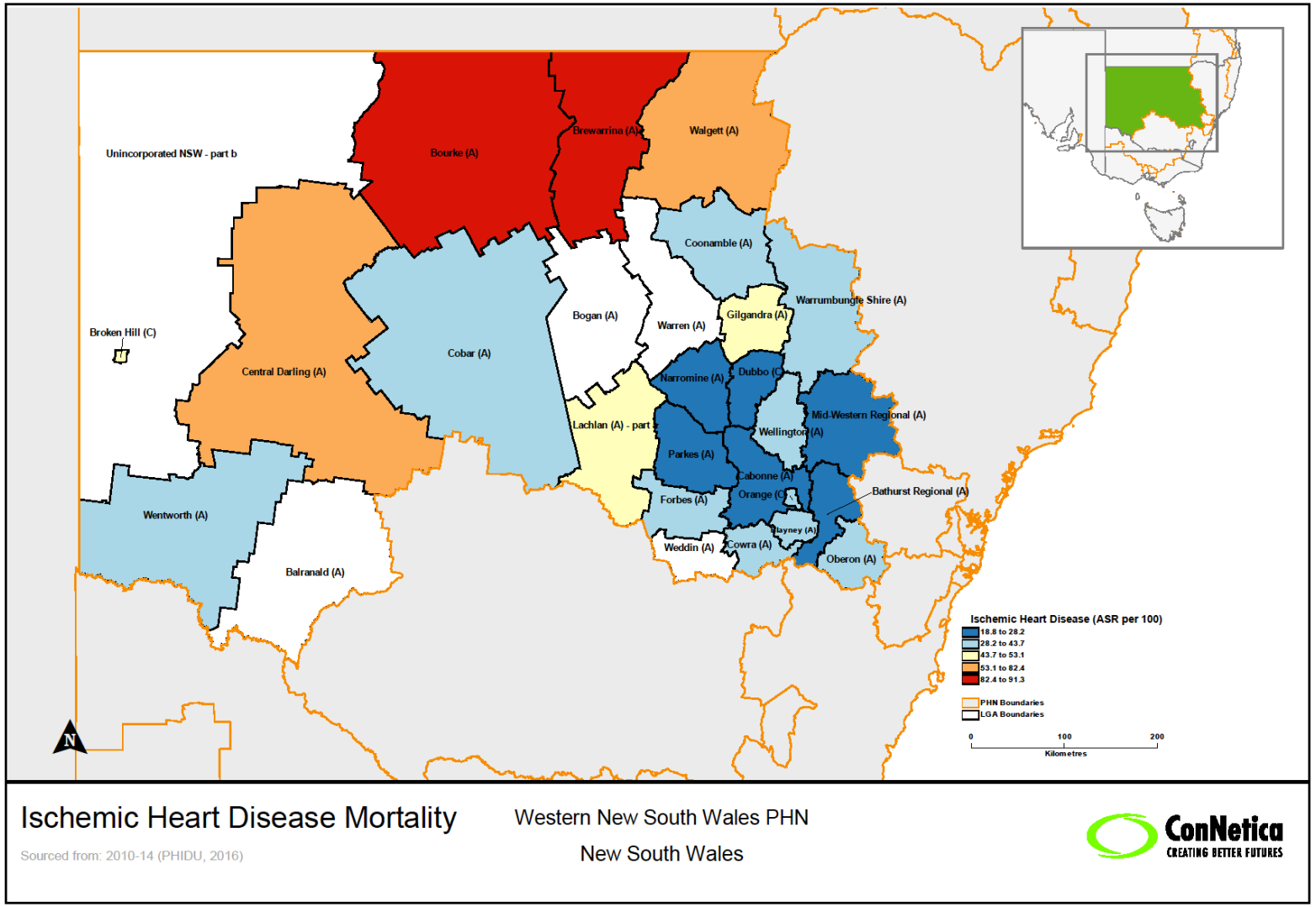


FIGURE 32 ESTIMATED ISCHEMIC HEART DISEASE MORTALITY IN THE WNSW PHN REGION

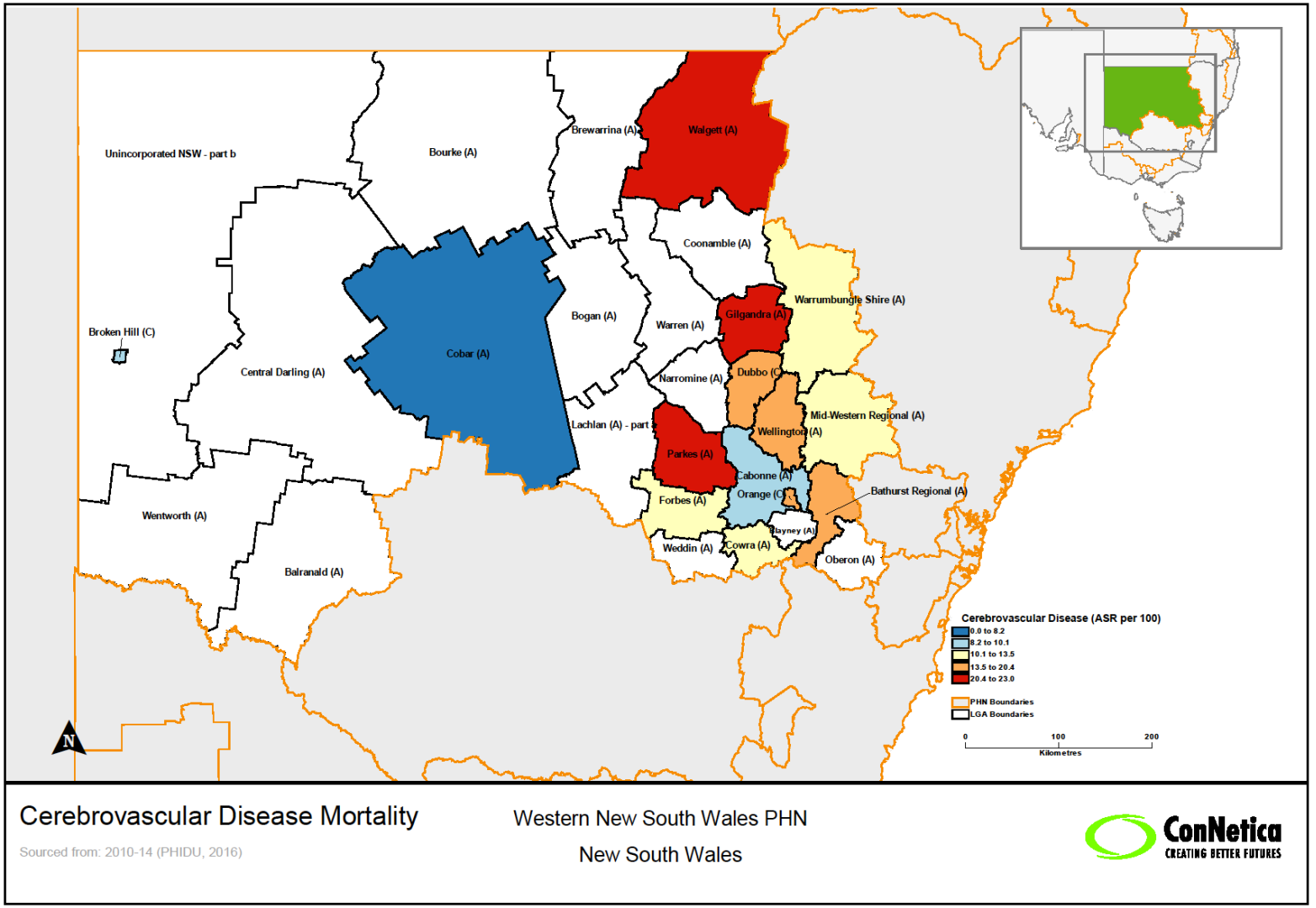


FIGURE 33 ESTIMATED CEREBROVASCULAR DISEASE MORTALITY IN THE WNSW PHN REGION

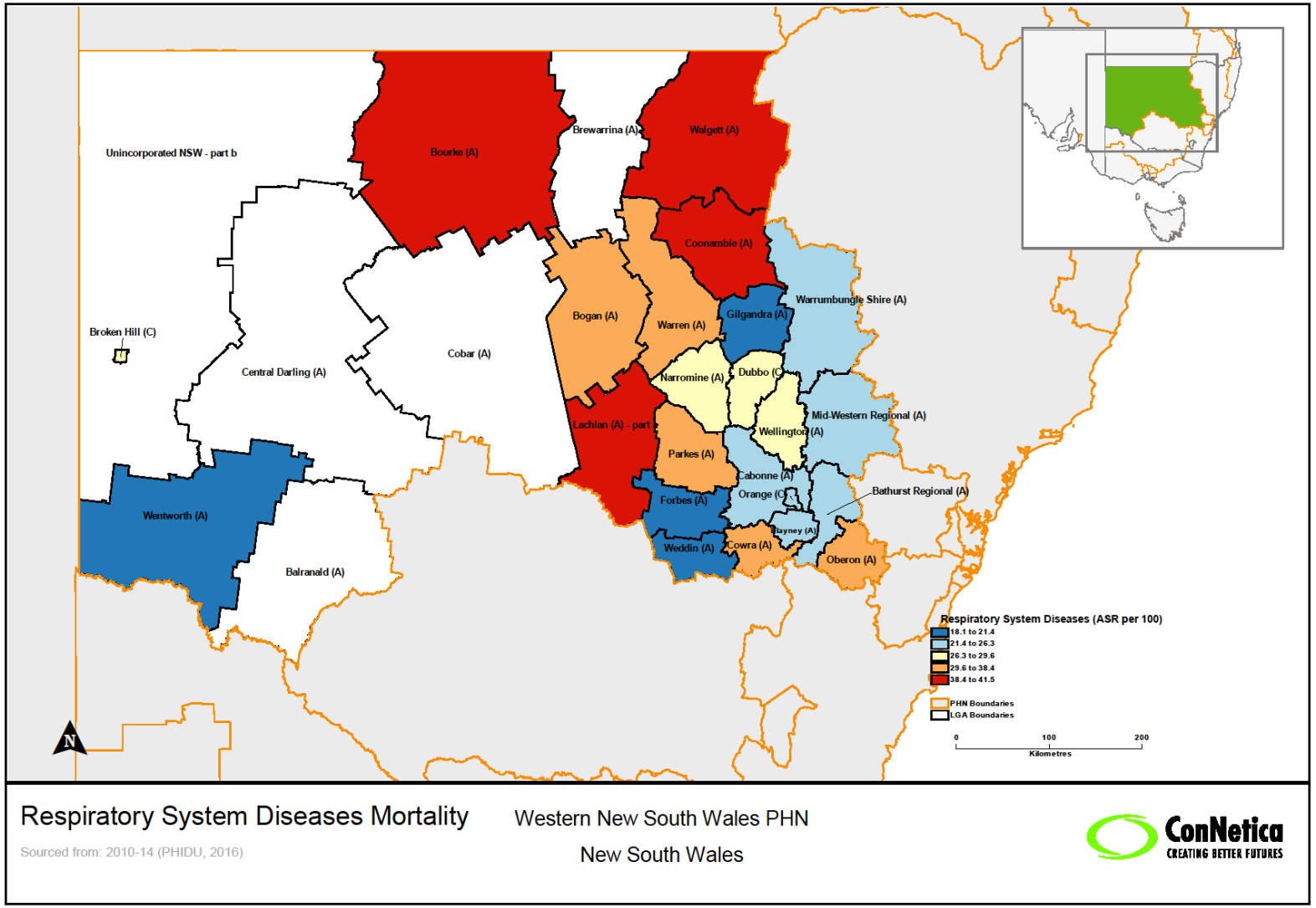


FIGURE 34 ESTIMATED RESPIRATORY DISEASE MORTALITY IN THE WNSW PHN REGION

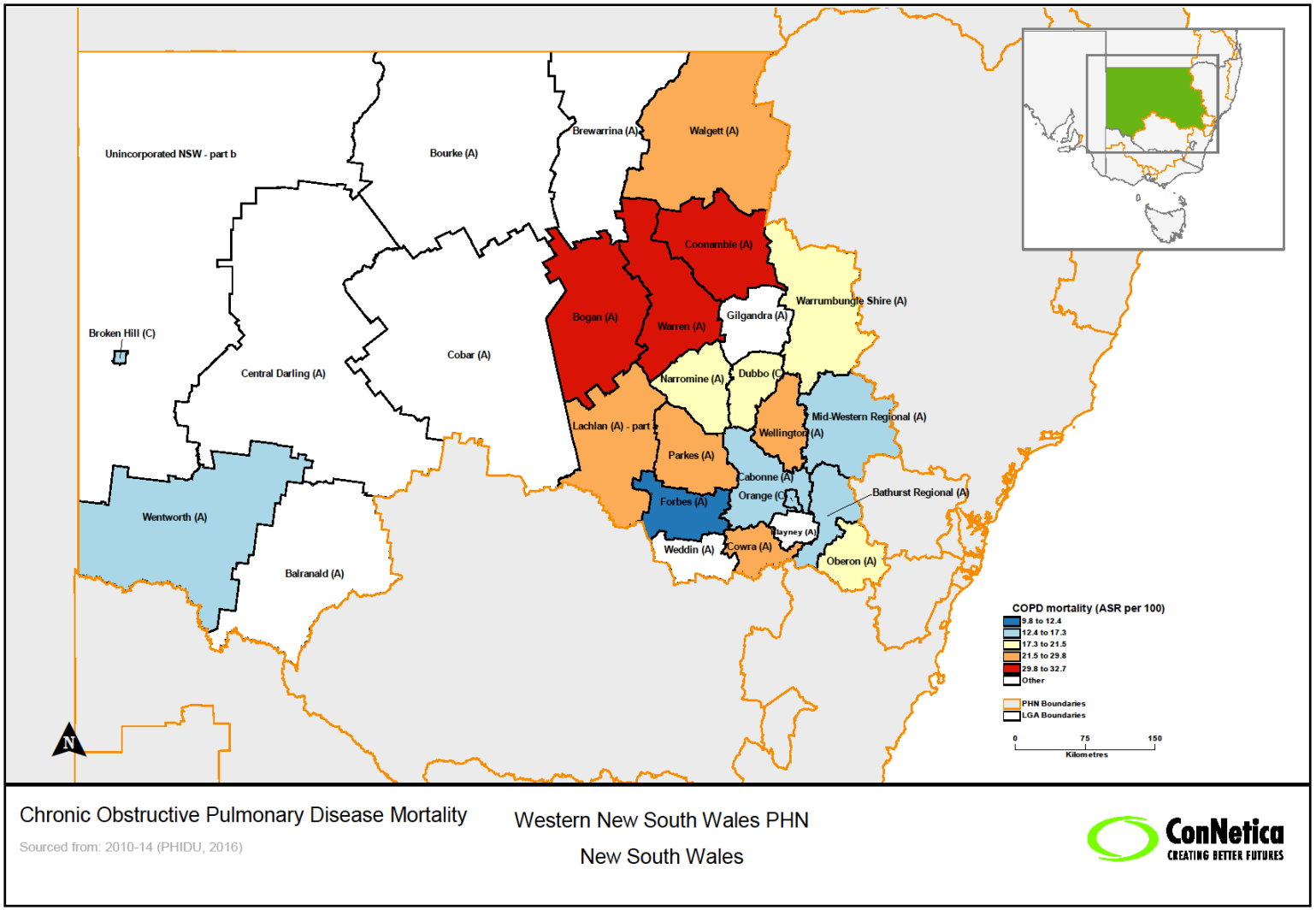


FIGURE 35 ESTIMATED COPD MORTALITY IN THE WNSW PHN REGION

5. Chronic Care Data

5.1 Medicare Benefits or Medicare Funded Services

For this report, MBS claims related to GP chronic disease care, GP health assessments, allied health and practice nurses/Aboriginal health workers were deemed most relevant to the measurement of chronic care provision.

A total of 45,727 patients were seen in the 2014-2015 financial year in the WNSW PHN catchment relating to chronic disease by GPs (Department of Health, 2016). Over 110,000 services were provided in the region which related specifically to chronic care in GP practices (Table 15). This data is not available at LGA level.

TABLE 15 WNSW PHN REGION MBS UTILISATION BY PROVIDER TYPE 2014-2015

Service Type	Patients (n)	Services (n)	Benefits Paid	Fees Charged
GP Chronic Disease	45,727	111,943	$12,034,753	$12,038,658
GP Health Assessments	23,767	24,415	$4,950,920	$4,951,117
Allied Health	21,268	63,039	$3,351,260	$3,635,910
Practice Nurse / Aboriginal Health Worker	17,792	38,630	$599,149	$599,167
Total	**127,285***	**294,685**	**$25,567,260**	**$26,638,054**

*Note: the total number of patients is less than patient numbers for each service type, as a single person could be a patient for a number of services and is only counted once in the total.

5.2 GP Service Data

Service data for GPs also sheds light on the extent of chronic care and chronic disease in the WNSW PHN catchment. The prevalence of circulatory, respiratory and endocrine diseases in both GP encounters and amongst active patients illustrates that the WNSW PHN region has higher proportions of these diseases when compared with NSW and national data. (Table 16). This data was accessed from the 'Bettering the Evaluation and Care of Health' project. Active patients reflects data that has been weighted to account for patients with high and low frequency GP visits, providing a more robust estimate of disease prevalence (Harrison & Valenti, 2017).

TABLE 16 PREVALENCE OF KEY CHRONIC CONDITIONS IN GP ENCOUNTERS

	Prevalence amongst GP encounters			Prevalence amongst active patients		
Disease Type	WNSW PHN	NSW	Australia	WNSW PHN	NSW	Australia
Circulatory	40.48%	32.96%	32.42%	27.98%	19.22%	18.71%
Respiratory	17.01%	14.72%	14.63%	12.59%	9.32%	9.34%
Endocrine	36.97%	31.12%	30.73%	27.25%	19.70%	19.60%

5.3 Rate of Hospitalisation Data

The NSW Combined Admitted Patient Epidemiology Data offers another lens through which to view the effects of chronic illness at the tertiary care level, and directly on individuals (NSW Ministry of Health, 2016).

For COPD, hospitalisations appear to be trending downward for those in Dubbo, however in the most recent data Coonamble has observed a spike in COPD related hospitalisations. Both LGAs have rates significantly higher than the state average (Figure 36).

The story is somewhat similar for CVD, with Dubbo and Coonamble recording significantly higher rates than the state average, however both LGAs appear to have no clear trend increases or decreases in CVD related hospitalisations (Figure 37).

The rate of diabetes and selected associated disease deaths shows that Dubbo and Coonamble have higher rates than the state average, with Coonamble appearing relatively constant over time and Dubbo showing a slight spike in diabetes related deaths in 2010-2011 (Figure 38). It should be noted, however, that given Coonamble's low population there are considerably wide 95% confidence intervals for rates in this area. As such, the differences observed in rates below should be viewed with a degree of caution.

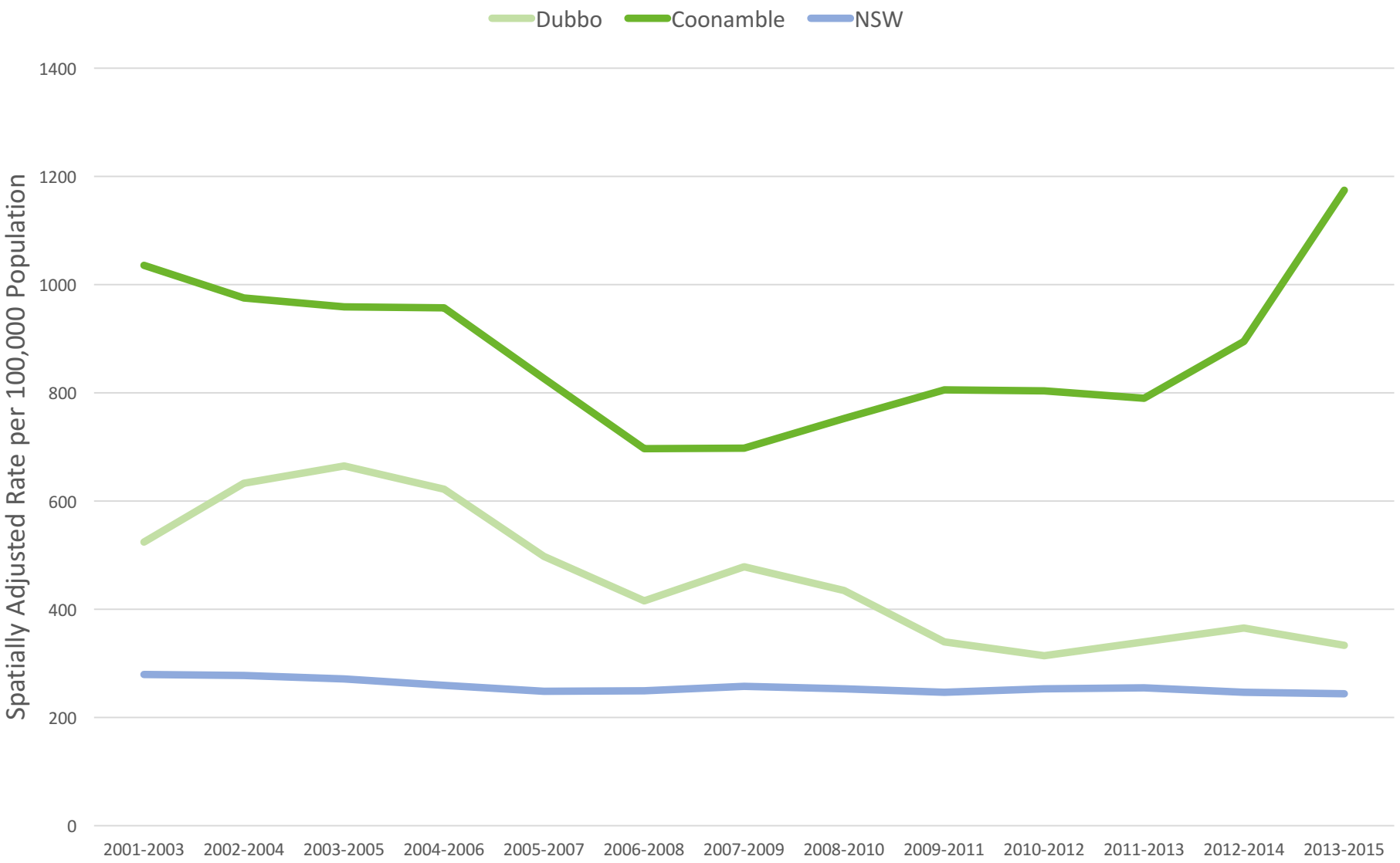


FIGURE 36 CHRONIC OBSTRUCTIVE PULMONARY DISEASE HOSPITALISATIONS, DUBBO & COONAMBLE & NSW

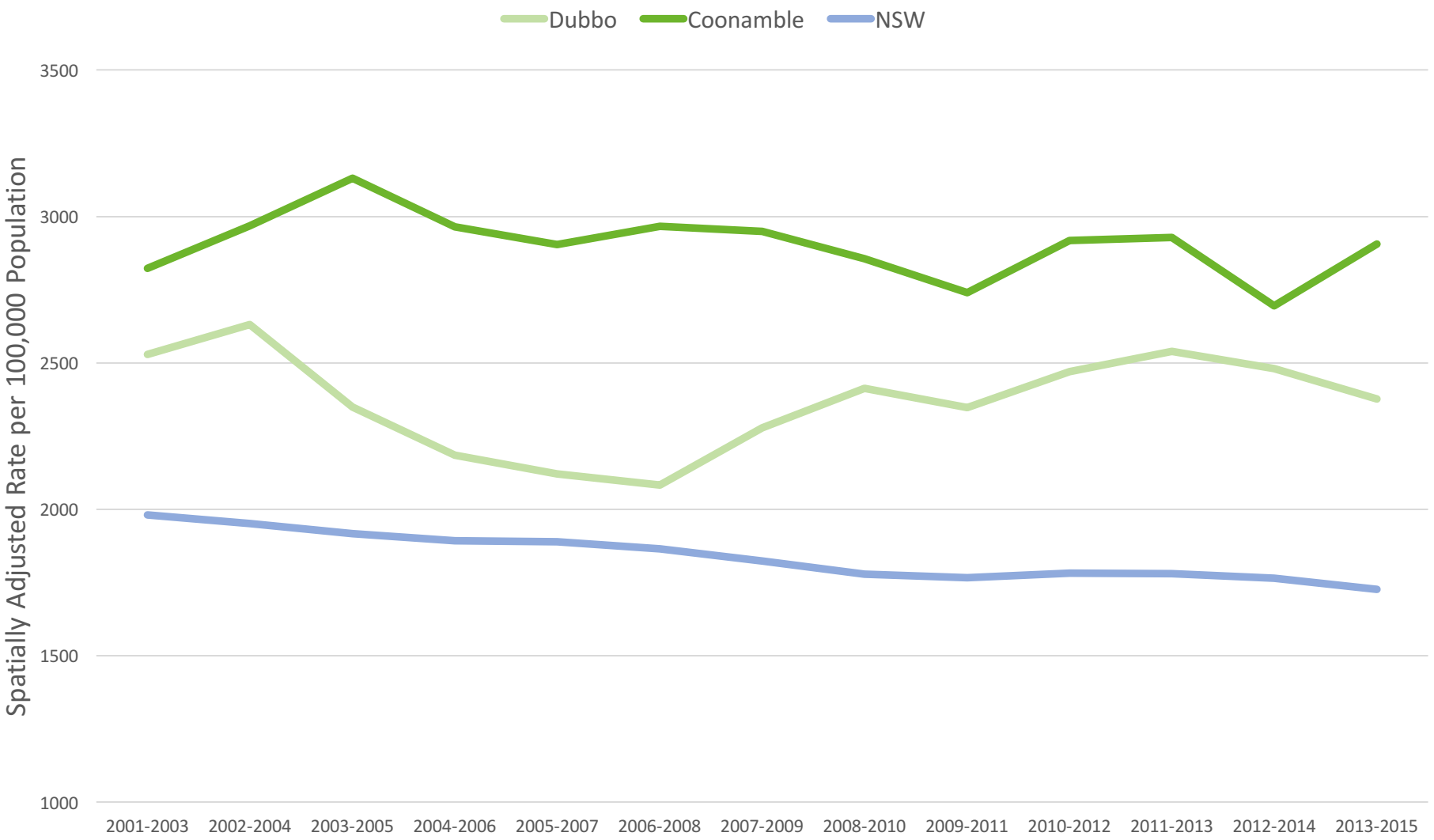


FIGURE 37 CARDIOVASCULAR DISEASE HOSPITALISATIONS FOR DUBBO, COONAMBLE AND NSW

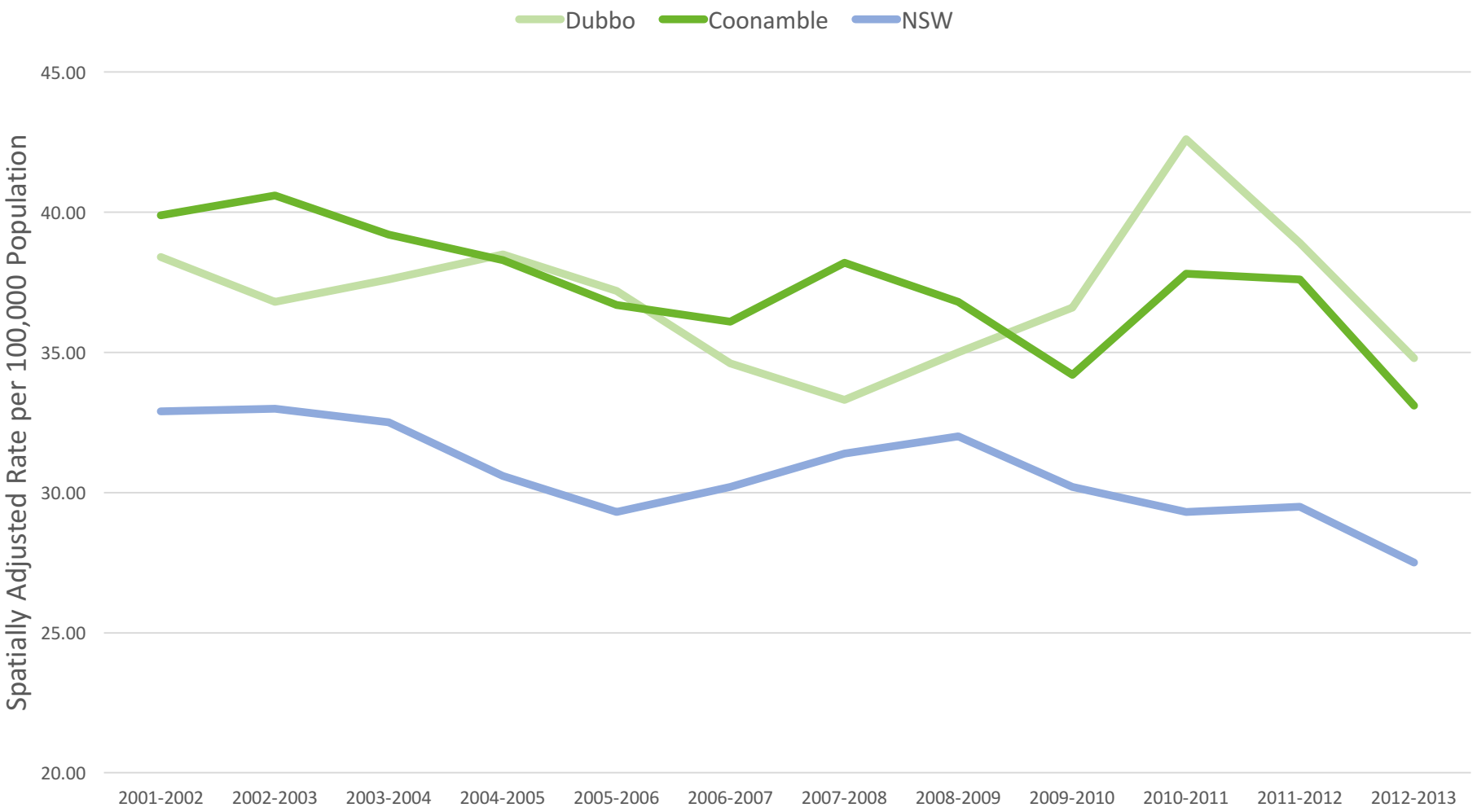


FIGURE 38 DIABETES AND SELECT ASSOCIATED DEATHS FOR DUBBO, COONAMBLE AND NSW

5.4 Potentially Preventable Hospitalisations

As a key performance indicator for PHNs and hospitals across Australia, Potentially Preventable Hospitalisations (PPH) provide a system level indication of the impact of chronic care. The PPH rates for chronic disease in 2014/2015, shows that Bourke-Cobar-Coonamble has the highest rate at 2,642 per 100,000 followed by Broken Hill and Far West at 1,863 per 100,000 (Centre for Epidemiology and Evidence, 2017) (Figure 39).

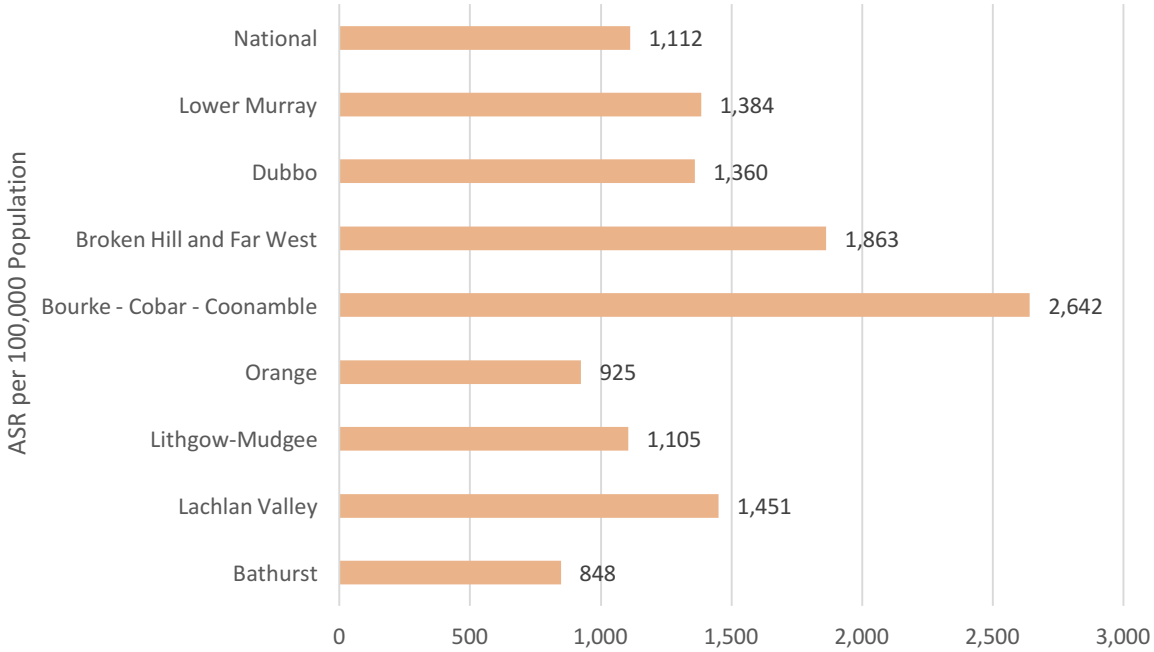


FIGURE 39 POTENTIALLY PREVENTABLE HOSPITALISATIONS BY SA3: CHRONIC DISEASE

For COPD the PPH rate is again higher for Bourke-Cobar-Coonamble when compared with all other areas (Figure 40). Orange and Bathurst are the only areas to have lower rates than the national average. Of concern, Bourke-Cobar-Coonamble (1,001 per 100,000 population) is more than double the next highest SA3 which is Lower Murray (461 per 100,000 population).

For heart failure, the PPH rate is again highest in Bourke-Cobar-Coonamble (443 per 100,000 population) and is lowest in Bathurst (130 per 100,000 population) (Figure 41). The Dubbo SA3 has the second highest PPH rate related to heart failure, at 258 per 100,000 population.

For Diabetes, the PPH rates are highest in the Bourke-Cobar-Coonamble area in the WNSW PHN region (390 per 100,000 population), followed by Broken Hill and the Far West (241 per 100,000 population) and Lachlan Valley (224 per 100,000 population). Orange and Bathurst recorded the lowest PPH rates at 114 and 188 per 100,000 population respectively (Figure 41).

Overall, PPH rates appear to be higher in remote or very remote areas with a lack of access to major hospital and/or health service facilities. This is coupled with the high degree of health and social inequalities in remote and very remote locations.

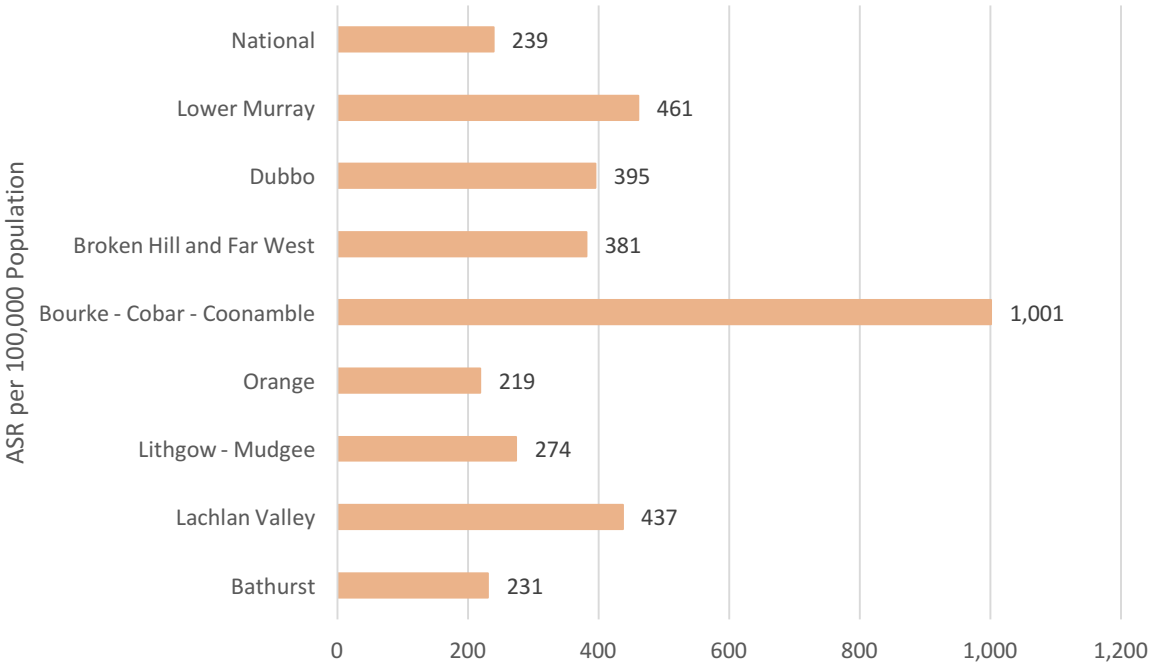


FIGURE 40 POTENTIALLY PREVENTABLE HOSPITALISATIONS BY SA3: COPD

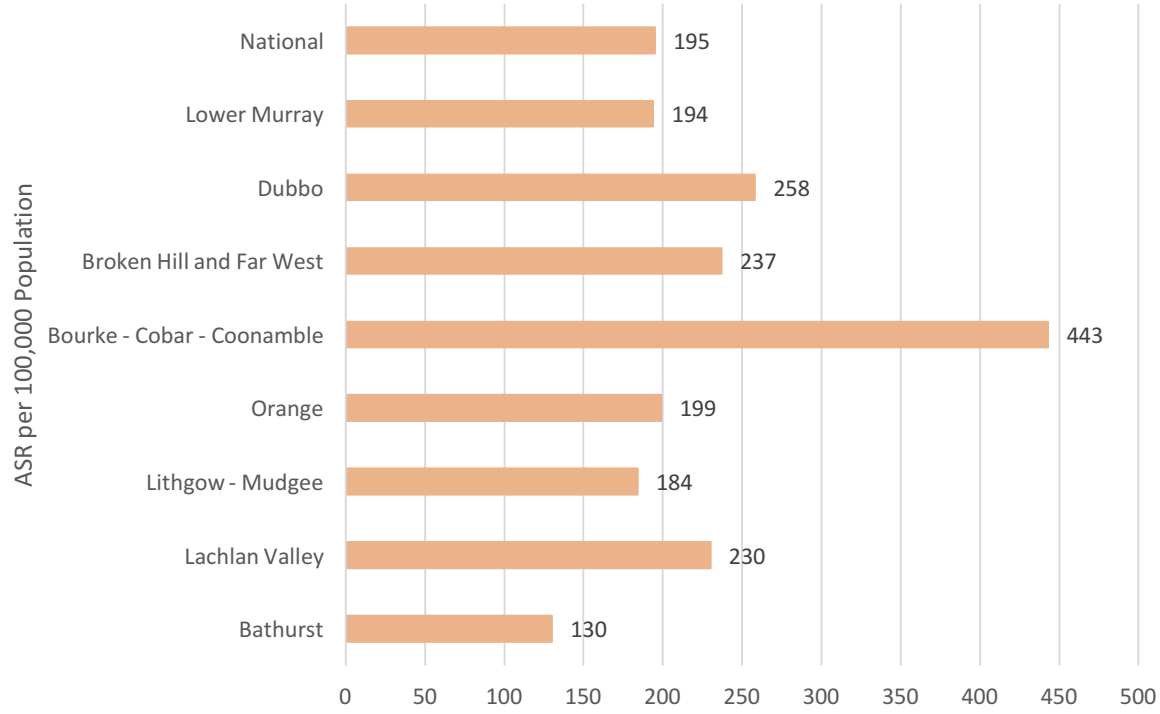


FIGURE 41 POTENTIALLY PREVENTABLE HOSPITALISATIONS BY SA3: HEART FAILURE

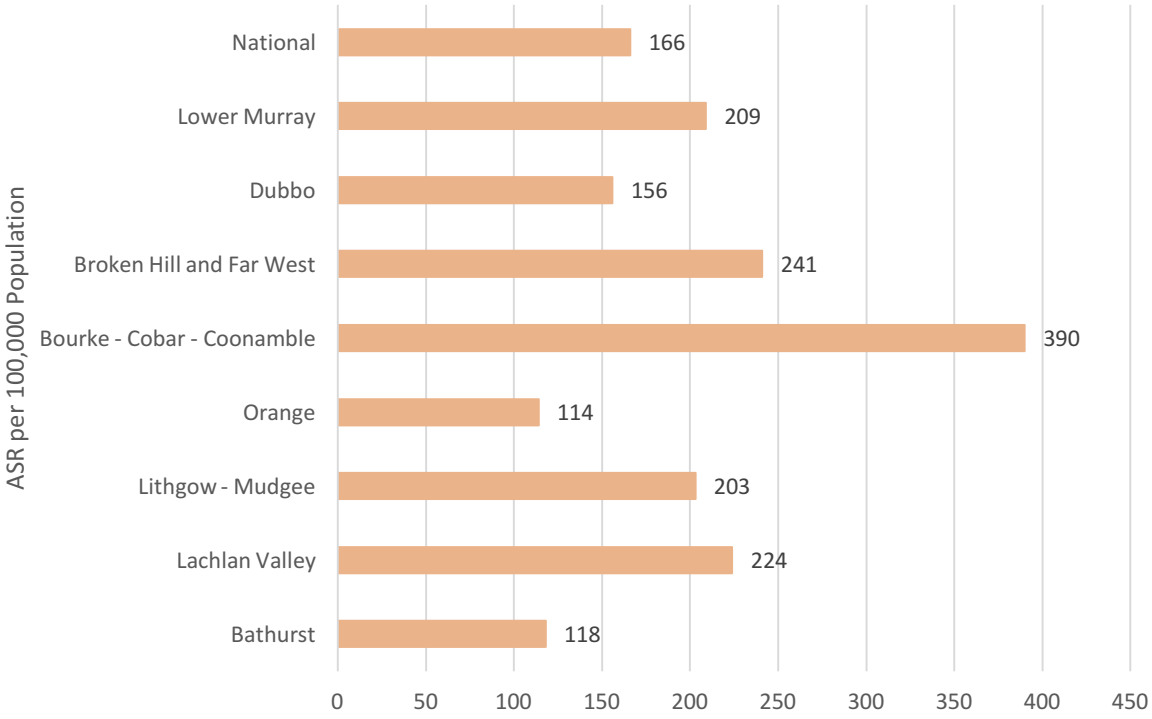


FIGURE 42 POTENTIALLY PREVENTABLE HOSPITALISATIONS BY SA3: DIABETES

6. Chronic Care Services in Dubbo and Coonamble

6.1 Overview

In this section of the Atlas the type, availability and location of service delivery teams (or BSIC) specifically focused on delivering chronic care in Dubbo and Coonamble is described. Each of the key DESDE classifications is presented in turn, describing the services available under each type.

Services for specific population groups will be highlighted within each of the relevant service categories, as well as in summary at the end of the chapter.

For simplicity, where services are described as catering for all age groups (GX), they are included within the Adult sections as in practice more adults utilise these services. These are readily identifiable by the GX at the start of the DESDE code.

There were a total of 36 BSIC identified that deliver chronic disease care in Dubbo (N = 23) and Coonamble (N = 13). This equates to a rate of 139.21 MTC per 100,000 adult population. All of these services are for adults (N = 7) or the general population (N = 29).

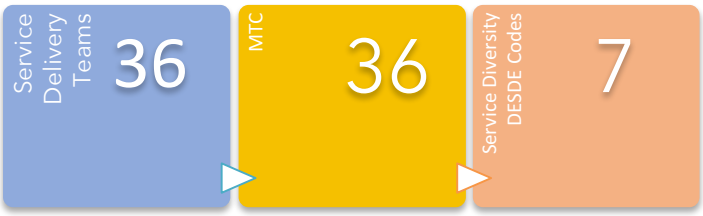


FIGURE 43 SUMMARY OF SERVICES PROVIDING CARE FOR COPD, CVD AND DIABETES

Nineteen of the 36 MTC (53%) are provided by Health Services, including Aboriginal Medical Services, and 17 are provided by others such as private health service providers including Marathon Health and General and Specialist Practices (providing free or bulk-billed services for their patients) (Table 17).

TABLE 17 MAIN TYPES OF CHRONIC CARE IN DUBBO AND COONAMBLE

Population Group	Provider Type	R	D	O	A	I	S	TOTAL
Child & Adolescent	Health	0	0	0	0	0	0	0
	PRV/Other	0	0	0	0	0	0	0
	Sub-total	0	0	0	0	0	0	0
Adult	Health	0	0	16	3	0	0	19
	PRV/Other	0	0	16	0	1	0	17
	Sub-total	0	0	32	3	1	0	36
Older Adult	Health	0	0	0	0	0	0	0
	PRV/Other	0	0	0	0	0	0	0
	Sub-total	0	0	0	0	0	0	0
Total	Health	0	0	16	3	0	0	19
	PRV/Other	0	0	16	0	1	0	17
	Total	**0**	**0**	**32**	**3**	**1**	**0**	**36**
		0%	**0%**	**89%**	**8%**	**3%**	**0%**	**100%**

R - Residential; **D** – Day Care; **O** – Outpatient; **A** – Accessibility; **I** – Information and Guidance; **S** – Self-help and voluntary

By far the largest number of teams are focused on delivering Outpatient services (89%), followed by Accessibility services (8%) and Information services (3%) (Figure 44). In terms of team sizes, these are very small or small teams with an average 1.04 FTE staff in each team.

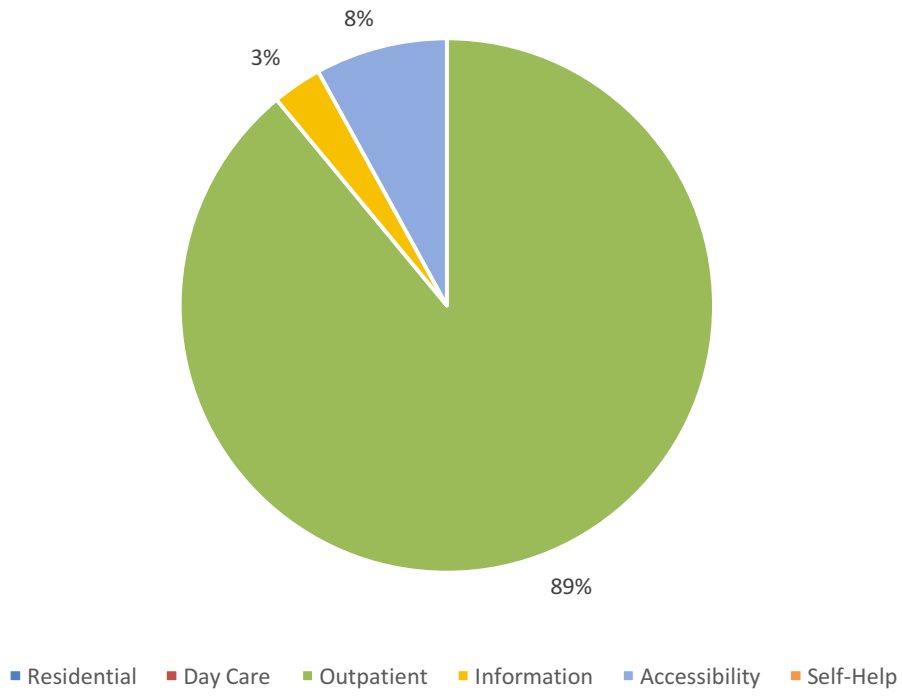


FIGURE 44 SERVICE DELIVERY TEAMS (BSIC) BY TYPE

To place data relating to the MTC into context, comparisons can be made between each service type and both the total number of MTC per region (N = 36) (Figure 45) and the rate per 100,000 adult population which was 139.21 MTC per 100,000 adult population for Dubbo and Coonamble combined (Table 18). As a comparative example, there was a total of 89.45 Mental Health MTC per 100,000 adult population across the WNSW PHN region.

This information must be considered alongside the size of the teams. It is common in rural and remote areas to see a relatively large number of teams however they are relatively small or even 'micro' teams and frequently work less than standard business hours. This is discussed in more detail in the workforce section of this report.

TABLE 18 CHRONIC DISEASE MTC PER 100,000 ADULT POPULATION

	Information		Accessibility		Outpatients		Total	
Region	**n**	**MTC /100,000**	**n**	**MTC /100,000**	**n**	**MTC /100,000**	**n**	**MTC /100,000**
Dubbo	1	4.26	3	12.78	19	80.94	23	97.98
Coonamble	0	0	0	0	13	545.07	13	545.07
Combined	1	3.87	3	11.60	32	119.88	36	139.21

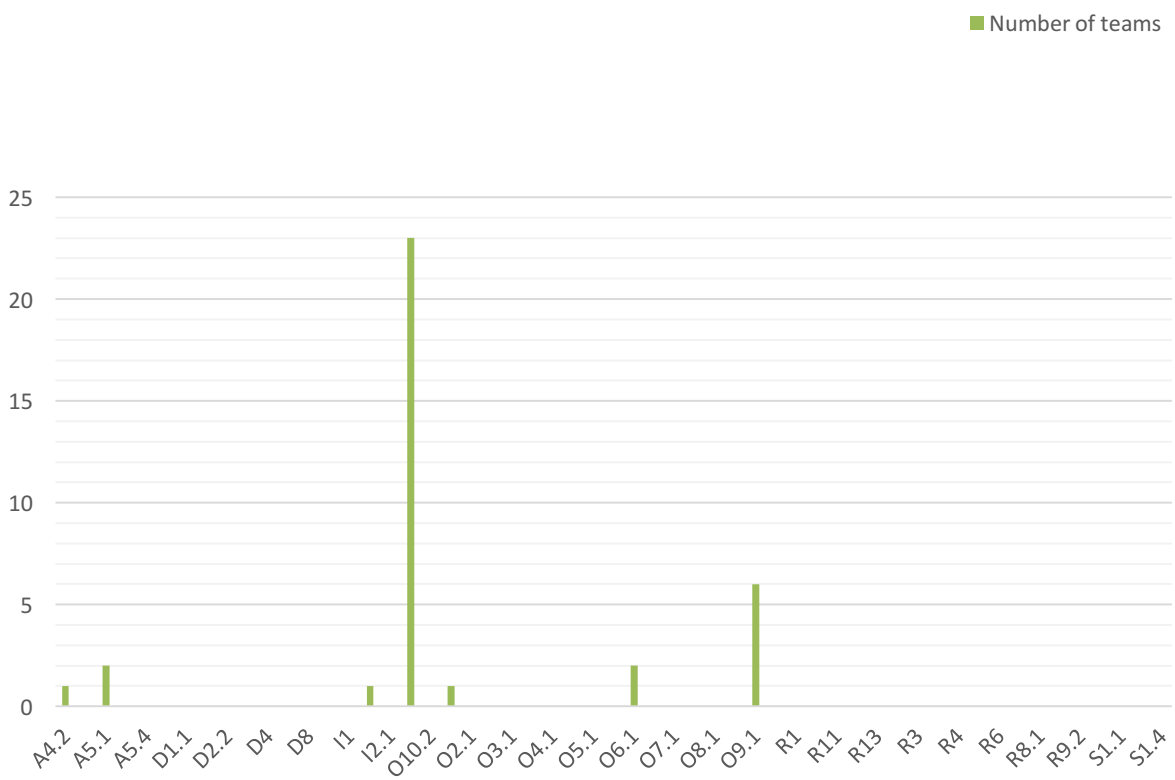


FIGURE 45 NUMBER OF CHRONIC DISEASE SERVICE DELIVERY TEAMS BY MTC IN DUBBO AND COONAMBLE

6.2 Residential Care

The impact of chronic disease is most obvious in the hospital system. Whilst there were no specific specialist units within the Dubbo Base Hospital or the Coonamble Multi-purpose Service for treating COPD, CVD or Diabetes, data suggests chronic conditions make up a large part of the emergency department presentations and inpatient stays at these services.

The NSW Combined Admitted Patient Epidemiology Data shows a recent spike in admissions for COPD in Coonamble and both Dubbo and Coonamble have COPD rates significantly higher than the state average (NSW Ministry of Health, 2016). Rates of hospitalisations for CVD are also above the state average for Dubbo and Coonamble. Across NSW hospitalisations for which diabetes was recorded as the principal diagnosis increased by more than 155% between 1989/90 and 2008/09 (WNSW LHD, 2012).

As indicated earlier in the report, data suggests that across the region PPH admissions for chronic disease are highest in the Bourke-Cobar-Coonamble SA3 area. This is also the case for PPH admissions related to COPD, which are more than twice the rate of the next highest SA3 area. For PPH admissions due to heart failure, again Bourke-Cobar-Coonamble is the highest in the region, with Dubbo being the second highest.

Data on hospital separations at Dubbo Base Hospital in 2010/2011 indicate that separations for Diabetes, Heart Failure, COPD and Bronchitis and Asthma are at similar levels to those in 2006/2007 (Table 19).

TABLE 19 CHRONIC DISEASE SEPARATIONS AT DUBBO BASE HOSPITAL 2006/07 – 2010/11

Chronic Disease	2006/07	2007/08	2008/09	2009/10	2010/11	Total
Diabetes	101	111	127	91	93	523
Heart Failure	128	89	127	122	131	597
COPD	156	217	202	164	165	904
Bronchitis and Asthma	113	143	129	104	119	608
Total	**498**	**560**	**585**	**481**	**508**	**2,632**

6.3 Day Care

There were no Day Care chronic disease services identified in the Dubbo and Coonamble LGAs.

6.4 Outpatient Care

Acute Mobile Outpatient Care (O1 and O2 DESDE Codes)

There were no Acute Mobile Outpatient care teams delivering services specifically for the treatment of COPD, CVD or Diabetes in Dubbo or Coonamble.

Whilst chronic kidney disease was not within the scope of this Atlas, there is a strong relationship between kidney disease and CVD disease. Whilst not included in the mapping, the Dubbo Dialysis and Renal Outreach Team operates out of the Dubbo Base Hospital providing both acute end stage renal dialysis care and mobile outreach via a nursing and medical team. This includes nursing outreach of approximately 35% into homes and medical outreach to surrounding medical centres in Bourke, Cobar, Brewarrina, Coonamble, Mudgee and Walgett. This team also has a telehealth service.

Acute Non-Mobile Outpatient Care (O3 and O4 DESDE Codes)

There were no teams identified as providing Acute Non-Mobile chronic disease services in the Dubbo and Coonamble LGAs.

Non-Acute Mobile Outpatient Care (O5, O6 and O7 DESDE Codes)

There were two teams identified as providing Non-Acute Mobile chronic disease services in the Dubbo and Coonamble LGAs (Table 20). A Complex Care Nurse Practitioner works two days a week in Dubbo at the Dubbo Base Hospital and one day per week in Coonamble. This role is varied and includes a mix of in-hospital and outreach work. Work includes assessment, case management and care coordination, education, completing action plans and liaison with doctors. The main focus of the role is to intervene early and prevent hospitalisations, assist people with managing their condition, help seeking and improving the patient experience whilst in hospital. Contact with patients is generally very long-term, starting with weekly contact which reduces over time. Complex Care Nurses work closely with the Palliative Care services and this is the case in Dubbo where there was a close relationship evident between the Complex Care Nurse and the Palliative Care service running out of Lourdes Hospital.

The number of Non-Acute Mobile Outpatient MTC per 100,000 adults is 7.73.

TABLE 20 NON-ACUTE MOBILE OUTPATIENT CHRONIC CARE IN DUBBO AND COONAMBLE

Provider	Name	Suburb	DESDE – 1	FTE	Comments
Dubbo Health Service	Complex Care Nurse Practitioner - Dubbo	Dubbo	GX[ICDc] - O6.1u	0.4	2 days per week
	Complex Care Nurse Practitioner - Coonamble	Coonamble	GX[ICDc] - O6.1ut	0.2	1 day per week

Non-Acute Non-Mobile Outpatient Care (O8, O9 and O10 DESDE Codes)

There were 29 teams identified as providing Non-Acute Non-Mobile services in the Dubbo and Coonamble LGAs (Table 21).

The Bawrunga AMS in Dubbo offers a dietician who provides diabetes education one day per month, on a Saturday.

Private respiratory specialists at the Brisbane Street Medical Centre and Dr Roger Chatoor, whilst in private practice, do provide bulk billing to some patients and so are included in the mapping.

The Coonamble Aboriginal Health Service, in common with other general practices, offers chronic disease management plans. It provides smoking cessation for one day per week and an exercise physiologist 4 hours per month. If offers a podiatrist with funding provided by the Rural Doctors Network. It also provides diabetes education and a visiting dietician (currently provided by Marathon Health, however these were not considered 'stable' services in the DESDE context).

The Coonamble Multi Purpose Service provides a Cardio-Pulmonary Clinic once each week on a Wednesday afternoon. Using a Hub and Spoke model, it connects into specialists at Dubbo via telehealth facilities. Smoking cessation is also offered here, with a nurse providing spirometry, assessments and referrals, smoking counselling, smokaliser and follow-ups. Whilst this nurse works four days per week, smoking cessation is one part of her workload (estimated at 0.2 FTE). The Multi Purpose Service also runs two exercise groups(Table 22).

Dubbo Base Hospital provides a full-time Clinical Nurse Consultant who provides cardio-pulmonary rehabilitation, including home oxygen, and consultation liaison as an outpatient service.

The Betty Orth Unit at Dubbo Base Hospital is a specialist diabetes unit providing both inpatient and outpatient care to patients and families with both Type 1, Type 2 and Gestational Diabetes management. It provides education with Type 1, on starting insulin, admission for hyperosmolar hyperglycaemic state (HHS) and Diabetic ketoacidosis and severe hypoglycaemia. It provides outreach to Bourke, Brewarrina and Cobar monthly. It is one of the largest teams included in this Atlas and comprises 2.5 FTE Diabetes Educators, 1 FTE Nurse Manager, a Dietician (0.5 FTE), a Podiatrist (0.2 FTE), Endocrinologist (four days per month) and a Paediatrician two days per month. There are also two FTE Aboriginal Health Practitioners who do home visits and provide monthly support groups and clinics.

The Department of Respiratory Medicine is part of the Dubbo Health Service and is staffed by a respiratory scientist and two full-time respiratory clinicians. This service operates three clinics a week and provides in-reach to the wards at the hospital. As a regional service the respiratory scientist accepts referrals from GPs and external specialists directly, as well as via the clinicians in the team. Services provided include lung function testing, lung capacity, assessment of functional damage, respiratory impairment, pre-operative assessments and a paediatric service through paediatric outpatients. With support, nurses at general practices can perform lung function testing prior to prescribing inhalers, which does not occur for as many as 80% of inhaler prescriptions written by a GP (AIHW, 2016).

The number of Non-Acute Non-Mobile Outpatient MTC per 100,000 adults is 112.14.

TABLE 21 NON-ACUTE NON-MOBILE OUTPATIENT CHRONIC CARE IN DUBBO AND COONAMBLE

Provider	Name	Suburb	DESDE – 1	FTE	Comments
Bawrunga Aboriginal Medical Service	Dietician/ Diabetes Educator	Dubbo	GXIN[E08-E13] - O10.1	0.01	One day per month
Brisbane Street Medical Centre	Respiratory Physicians	Dubbo	GX[J00-J99] - O9.1	3.0	To be confirmed
Consultant Cardiologist	Dr Roger Chatoor	Dubbo	AX[I00-I99] - O10.1	3.0	
	Dr Roger Chatoor	Coonamble	AX[I00-I99] - O10.1t	Inc. above	Clinic every two months
Coonamble Aboriginal Health Service	Exercise Physiologist	Coonamble	GXIN[ICD] - O10.1	0.01	Four hours per month
	Podiatrist*	Coonamble	GXIN[ICD] - O10.1	0.05	
	Smoking Cessation Clinic	Coonamble	AX[F17] - O10.1	0.2	One day per week
Coonamble Multipurpose Service	Cardio-Pulmonary Clinic	Coonamble	AX[J44.9] - O10.1h	0.2	Wednesday PM
	Smoking Cessation	Coonamble	AX[F17] - O10.1	0.2	Average one day per week
Dubbo Base Hospital	Clinical Nurse Consultant - Cardio-Pulmonary Rehab	Dubbo	AX[J00-J99] - O9.1hl	1.0	Full-time position
	Betty Orth Unit - Specialist Diabetes Unit	Dubbo	GX[E08-E13] - O9.1	3.5	
	Betty Orth Unit - Aboriginal Health Practitioner	Dubbo	GXIN[E08-E13] - O10.1	2.0	
	Department of Respiratory Medicine	Dubbo	GX[J00-J99] - O9.1ha	5.0	
Dubbo Health Service Cardiology Clinic	Respiratory Physicians and Nurse	Dubbo	GX[J00-J99] - O10.1	3.0	To be confirmed
	Cardiology	Dubbo	GX[I00-I99] - O10.1	2.0	

Marathon Health	MOICDP Physician - Respiratory	Dubbo	GXIN[J00-J99] - O10.1	0.05
	MOICDP Physician – Cardiology*	Dubbo	GXIN[I00-I99] - O10.1	0.03
	MOICDP Physician – Endocrinology*	Dubbo	GXIN[E08-E13] - O10.1	0.10
	MOICDP Podiatrist*	Dubbo	GXIN[E08-E13] - O10.1	0.04
	MOICDP Pharmacist*	Dubbo	GXIN[E08-E13] - O10.1	0.15
	Dubbo Public Eye Clinic - MOICDP	Dubbo	GXIN[E08-E13] - O10.1	0.24
	RHOF Visiting Cardiology*	Dubbo	GX[I00-I99] - O10.1	0.24
	RHOF Visiting Respiratory Physicians*	Dubbo	GX[J00-J99] - O10.1	0.34
	MOICDP Diabetes Education Service*	Coonamble	GX[E08-E13] - O10.1t	0.05
	MOICDP Nurse - Pulmonary Rehabilitation*	Coonamble	GXIN[J00-J99] - O10.1	0.03
	MOICDP Dietitian/Nutritionist*	Coonamble	GXIN[I00-I99] - O10.1	0.03
	MOICDP Physician – General*	Coonamble	GX[E08-E13] - O9.1	0.03
	MOICDP Podiatrist*	Coonamble	GX[E08-E13] - O9.1	0.03
Peak Hill Aboriginal Medical Service	MOICDP Podiatrist	Peak Hill	GXIN[E08-E13] - O10.1	0.02

*It is possible some of the Marathon Health Medical Outreach Indigenous Chronic Disease Program (MOICDP) allocations are supplementing other services in this table and may therefore be double-counted. This will be clarified and corrected if necessary in the next draft of the Atlas.

Other Outpatient Care (O11 DESDE Code)

There was one team identified as providing Information and Guidance services in the Coonamble LGA which is an exercise group provided by the Coonamble Multi-purpose Service (Table 22).

The number of Other Outpatient MTC per 100,000 adults is 3.87.

TABLE 22 OTHER OUTPATIENT CHRONIC CARE IN DUBBO AND COONAMBLE

Provider	Name	Suburb	DESDE – 1	FTE	Comments
Coonamble Multi-purpose Service	Exercise Group	Coonamble	GX[ICD] - O11	0.10	Two groups per week. Open to all.

6.5 Accessibility Services

There were three teams identified as providing Accessibility services in the Dubbo LGA (Table 23).

The Community Care Co-ordinator for chronic disease management is a full-time position, based at Dubbo Base Hospital. This position is mobile, working into the hospital and visiting GP surgeries. The position is filled by a Registered Nurse. This role includes assessments, care coordination and managing referrals to relevant services and is the Connecting Care Coordinator position.

There is also a Connecting Care service which is part of the NSW CDMP. This is a chronic disease management service for people over the age of 16 years with congestive heart failure, coronary artery disease, COPD or diabetes who have difficulty managing their condition and are at risk of hospitalisation.

The primary focus of the program is acute care, with the aim of reducing hospitalisations and decreasing costs. According to the CDMP evaluation conducted at the end of 2013 there were 467 Aboriginal participants enrolled in the located in Dubbo (George Institute for Global Health, 2014). Most of these are adults, referred into the program from GPs including Aboriginal Community Controlled Health Services (ACCHS) and over 50% are male. Interestingly the 48-hour follow-up program was not identified as a referral pathway.

The program offers a single model of care coordination with health coaching incorporated. Some problems were identified with Argus, the shared data management/messaging system that underpins the program, however it was seen to support the sharing of patient information across service providers, something particularly important in remote areas. When admitted to hospital, the care coordinators employed through this program become the interface between the hospital or acute team and the community or primary health teams, such as GPs and Aboriginal Health Workers (AHWs) for example. Care Coordinators follow up with patients within 72 hours of discharge to ensure they are connected back into the appropriate services. This program is one that is viewed as a means of addressing the broader social issues that impact a patient's ability to effectively deal with their chronic diseases.

The Rheumatic Heart Disease Coordination position is a state sponsored project (ACI). This is currently provided by the Western NSW LHD District Chronic Care Coordinator. Rheumatic Heart Disease is a reportable disease and this service case manages these people, ensuring they are linked in to services and have access to Bicillin. There are currently only 10 patients in this program and none are from Dubbo or Coonamble.

The Indigenous Health Support Service (IHSS), known as Marrabinya, is provided by Maari Ma Health Aboriginal Corporation, in conjunction with Bila Muuji Aboriginal Health Services and funded by the Commonwealth Government's Integrated Team Care program via the WNSW PHN. The IHSS program aims to assist Aboriginal people to access and attend the care, services or aids they require as recommended by their GP. This includes making specialist appointments, arranging transport, or having medications packaged in Webster packs and walking frames, for example.

The IHSS is a relatively new model for clients and is a brokerage service that supports the patient care provided by the patient's GP in both General Practices and AMSs. The IHSS liaises between the client's primary care provider (e.g. GP or AMS), the client and the service they need and provide information back to the client's primary care provider. Any GP with an Aboriginal client eligible for the service can make contact with the relevant Care Coordinator. The Care Coordinator will discuss the needs of the client with the referring practice and the client, and put plans in place to address these needs (e.g. assist in completion of necessary paperwork, arranging payment of specialist gap fees, arranging travel and accommodation logistics around a specialist appointment, organising local

transport). This new model promotes clinical care being provided by the GP to prevent disconnected patient information and service delivery and promotes better integrated and patient centred-care (WNSW PHN, 2016). The organisation of the chronic care services prescribed by the patient's GP is facilitated by Chronic Care Link Workers from the Marrabinya program.

The number of Accessibility MTC per 100,000 adults is 11.60.

TABLE 23 ACCESSIBILITY CHRONIC CARE IN DUBBO AND COONAMBLE

Provider	Name	Suburb	DESDE – 1	FTE	Comments
Dubbo Base Hospital	Community Care Coordinator for CDM	Dubbo	GX[ICDc] – A4.1	1.0	
WNSW LHD	Rheumatic Heart Disease Coordination	Dubbo	GX[I09.9] – A5.1	N/S	
Maari Ma Health Aboriginal Corp	Indigenous Health Support Service (IHSS) - Marrabinya	Dubbo	GX[ICDc] - A5.1	N/S	

6.6 Information and Guidance

There was one team identified as providing Information and Guidance services in the Dubbo LGA which is diabetes specific service delivered by Morrison's Family Eyecare Centre (Table 24).

The number of MTC per 100,000 adults is 3.87.

TABLE 24 INFORMATION AND GUIDANCE CHRONIC CARE IN DUBBO AND COONAMBLE

Provider	Name	Suburb	DESDE – 1	FTE	Comments
Morrison's Family Eyecare Centre	Diabetes Specific Service	Dubbo	GX[E08-E13] - I1.1	6.0	FTE to be confirmed as diabetes specific

6.7 Self-help and Voluntary Support

There were no Self-Help and Voluntary teams delivering chronic care identified in the Dubbo and Coonamble LGAs.

6.8 Placement of Chronic Care Services

Not surprisingly for regional areas, services are predominantly focused in the major towns, in and around the District Hospitals and Multi-purpose Services. This is reflected in the service locations for both Dubbo (Figure 46) and Coonamble (Figure 47).

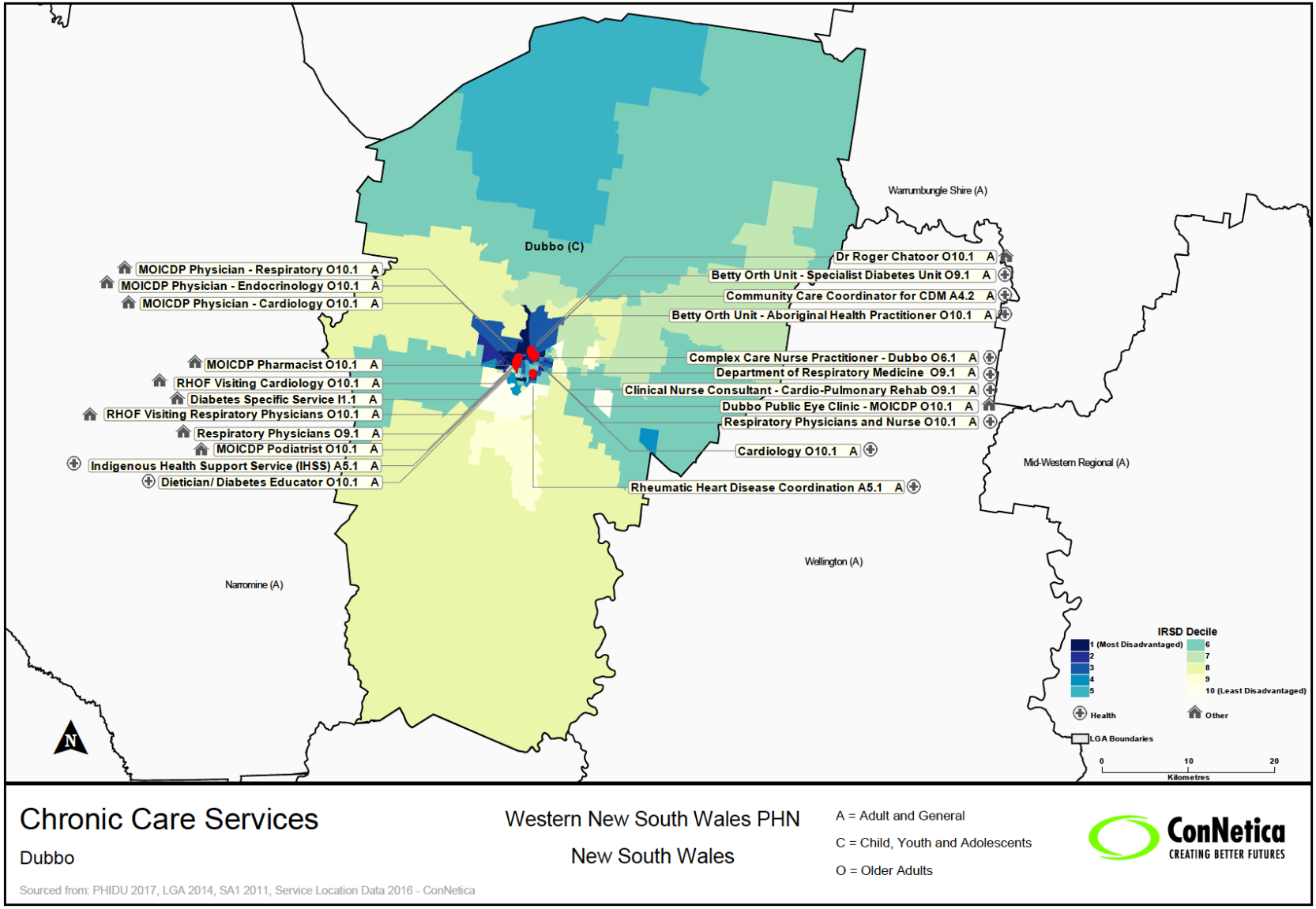


FIGURE 46 PLACEMENT OF CHRONIC CARE SERVICES: DUBBO

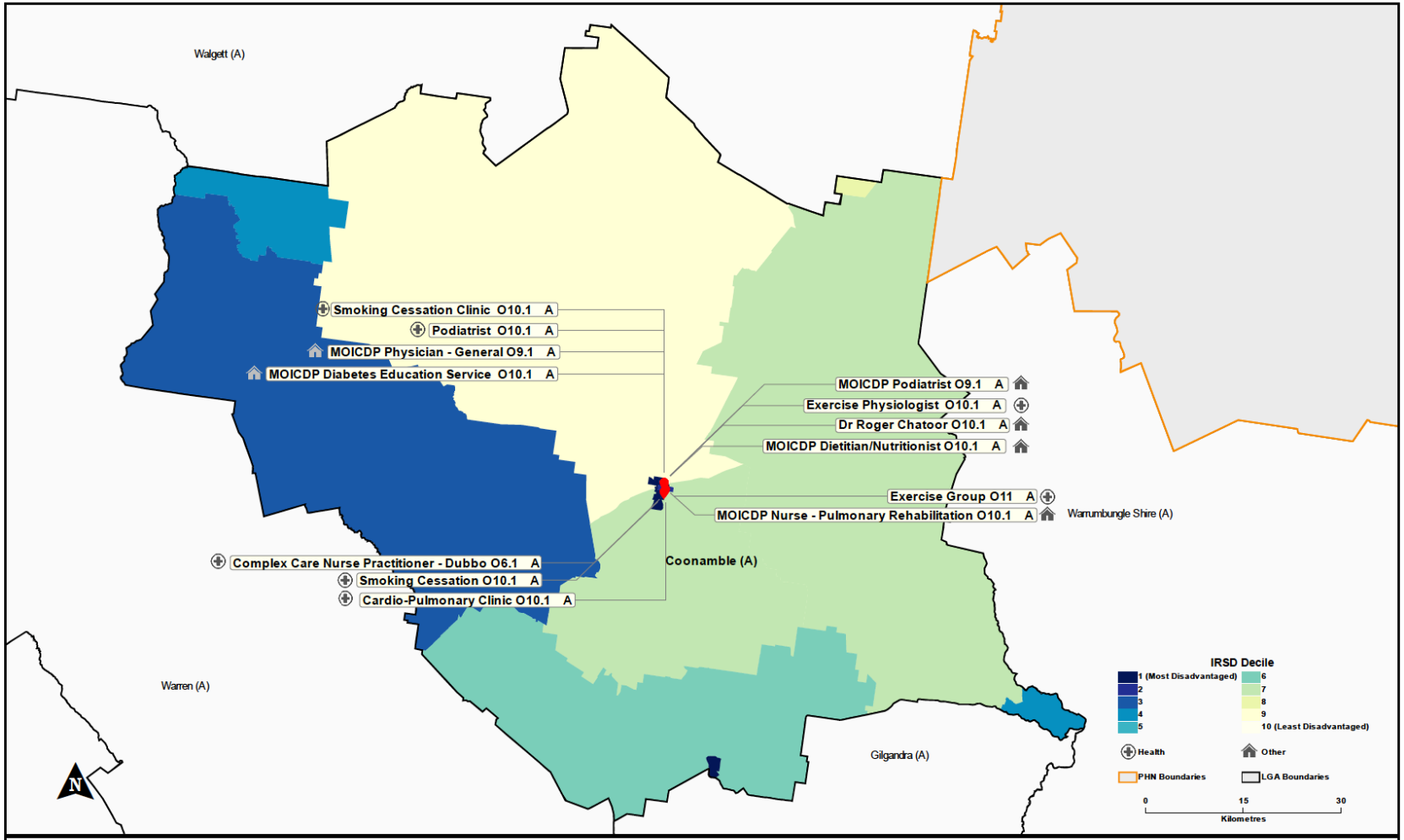


FIGURE 47 PLACEMENT OF CHRONIC CARE SERVICES: COONAMBLE

6.9 Patterns of Chronic Health Care

To understand the nature of a health care system and the balance between the different types of care within that system, a radar tool, also known as a spider diagram, is utilised. The spider diagram is a tool to visually depict the mix of service types (pattern of care) in a particular system. Each of the 21 points on the radius of the spider diagram represents the number of MTC for a particular type of care per 100,000 adults.

The patterns of chronic disease care for Dubbo (Figure 48) and Coonamble (Figure 49) are similar in that they both have treatment and support for chronic disease which is almost entirely clinical.

The patterns of care indicate that:

- There are a very high proportion of Outpatient ‘teams’ per 100,000 population but this is largely a function of the small scale of the teams and the remote and rural location
- Inpatient acute chronic disease care is provided in the general wards of the District Hospital and Coonamble Multi Purpose Service which is not represented on the spider diagrams, and
- There is accessibility care, such as care coordination is based in Dubbo but not Coonamble (although it is likely that some outreach coverage to the area is provided by the Community Care Coordinator).

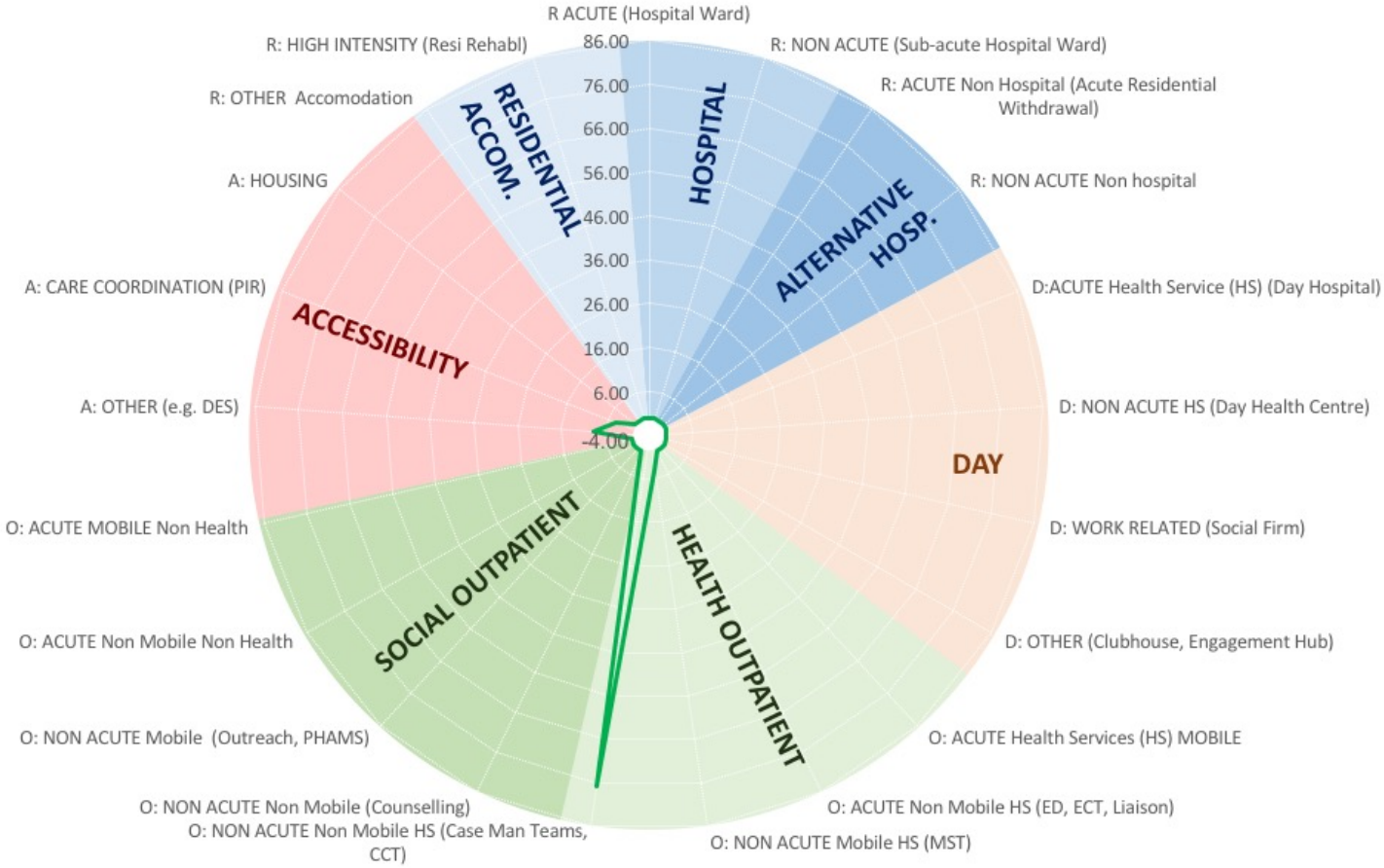


FIGURE 48 PATTERN OF CHRONIC CARE: DUBBO

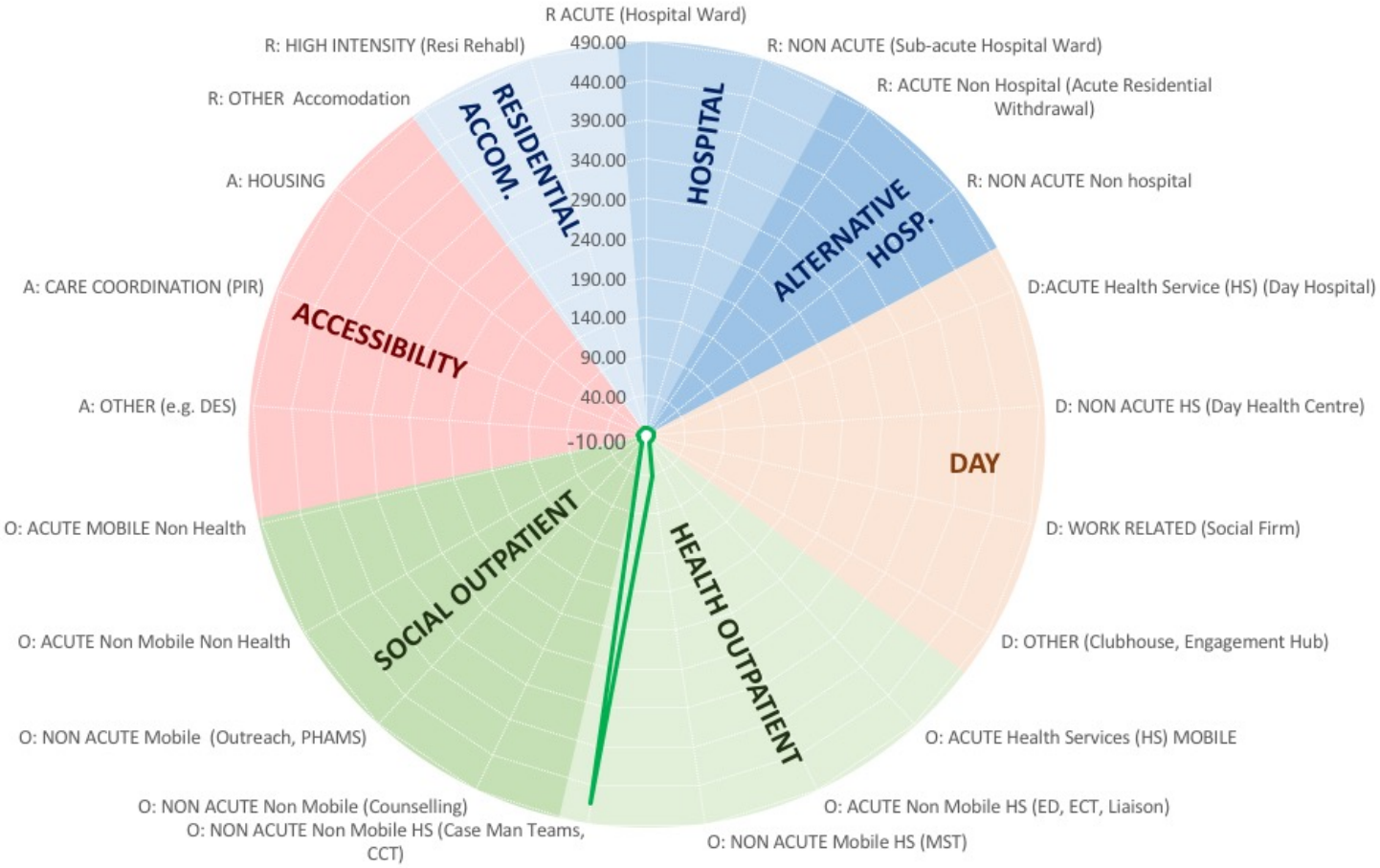


FIGURE 49 PATTERN OF CHRONIC CARE: COONAMBLE

6.10 Workforce Capacity

Introduction

During the data gathering process for this Atlas, stakeholders were asked to report the full time equivalent (FTE) staffing levels for each BSIC. Data was sometimes not able to be provided and at times the data provided was more of an estimation or lacked specificity. As such, the data presented here should be used as an approximation of the workforce characteristics.

Data was collected for 34 of the 36 chronic disease service delivery teams or BSIC identified in this project (94.4%), a total of 35.34 FTE reported. In terms of capacity, it helps to understand the sizes of the teams working across the area. To do this, teams are classified into four types either; extra small (<1 FTE), small (2-5 FTE), medium (from 6-20 FTE) and large (over 20 FTE).

Most chronic care teams across the Dubbo and Coonamble LGAs are extra small (47%) or small (32%) in size (Table 25). Twenty-five of the teams have less than one FTE, meaning they are single person, fractional or unitary teams. Small teams are much more vulnerable to staff absence and fluctuations in workload which places the system (and those individuals within it) under pressure. Coonamble has proportionately smaller teams than Dubbo.

Teams working in the private sector were similar in size compared to those working in the health sector with the overall average team size was 1.04 FTE (Table 26).

All the teams included in this Atlas were clinical or health-related teams. Most staff have a clinical qualification.

TABLE 25 DUBBO AND COONAMBLE CHRONIC DISEASE TEAM SIZES

Teams	Not Stated	X-Small (<1 FTE)	Small (1-5 FTE)	Medium (6-20 FTE)	Large (>20FTE)	Total
Dubbo	2	13	7	1	0	23
Coonamble	0	12	1	0	0	13
Total	**2**	**25**	**8**	**1**	**0**	**36**
%	-	73.5%	23.5%	3%	0%	100%*

*Please note – This is as a percentage for those that provided FTE (N=34).

TABLE 26 CHRONIC DISEASE AVERAGE TEAM SIZE BY SECTOR

Provider Type	Teams	Total FTE	Average Team Size
Health	17	18.98	1.12
PRV/Other	17	16.36	0.96
Total	34*	35.34	1.04

*Please note – This only includes the teams that provided FTE (N=34).

7. Comparatives

DESDE has now been utilised around the world for nearly 20 years. One of the strengths of using the methodology is that it allows for comparisons with other areas that have been mapped both nationally and internationally. Another advantage is that that the DESDE provides consistent types of care for different health and social (e.g. homelessness) conditions.

Using a standardised classification methodology allows for comparisons of the patterns of care between different regions, and for reflection on the differences and consistencies between them. There is no 'right' pattern of care. Indeed, as there is an increasing move toward regionalised service planning and design to best meet specific regional needs, there is an expectation that differences in these patterns with occur. The comparisons, both international and national, can be viewed as discussion starters; facilitating conversations in relation service planning and commissioning.

Within Australia the DESDE-LTC has been applied to create the following Atlases:

- The Integrated Mental Health Atlas of the Central and Eastern Sydney Primary Health Network Region (Salvador-Carulla et al, 2016b)
- The Integrated Mental Health Atlas of Western Sydney (Salvador-Carulla et al, 2016a)
- The Integrated Mental Health Atlas of The Far West (Salvador-Carulla et al, 2015b)
- The Integrated Mental Health Atlas of South Western Sydney (Salvador-Carulla et al, 2015a), and
- The Integrated Mental Health Atlas of Brisbane North (Mendoza et al, 2015).

It is also being utilised in Atlases that are due for publication in 2017 including:

- The Integrated Mental Health Atlas of Country Western Australia PHN Region
- The Integrated Mental Health Atlas of Metropolitan Perth
- The Integrated Mental Health Atlas of the Australian Capital Territory PHN Region
- The Integrated Mental Health Atlas of Northern Sydney PHN
- The Integrated Mental Health Atlas of Western NSW
- The Integrated Mental Health Atlas of South Eastern Melbourne PHN, and
- The Integrated Homelessness Atlas of South Eastern Melbourne PHN.

7.1 Comparing Patterns of Mental Health Care with Chronic Care

This Atlas represents the first application of the DESDE methodology specifically to COPD, CVD and Diabetes in the world.

Using the DESDE methodology means the pattern of chronic care can be compared to the patterns of care for mental health, Alcohol and Other Drugs (AOD) and homelessness in other parts of Australia and around the world. Whilst it is acknowledged there is no 'ideal' pattern of chronic care, comparatives open the discussion about the differences between systems and challenge us to think 'outside the box' of any one system.

One of the key differences between the system of mental health care in a rural and remote area with the system of chronic care is that chronic health care is almost entirely clinical in focus (Figure 50). The approach to mental health care is quite different, balanced between clinical and psycho-social, Acute and Non-Acute, Mobile and Non-Mobile forms of care.

When considered in the context of issues with treatment compliance in chronic health care, the importance of understanding the complexity of social and economic factors and supporting and

maintaining behaviour change, the contrast between systems raises an interesting question. What role might there be for the provision of psycho-social supports and increased care-coordination in the management of chronic disease?

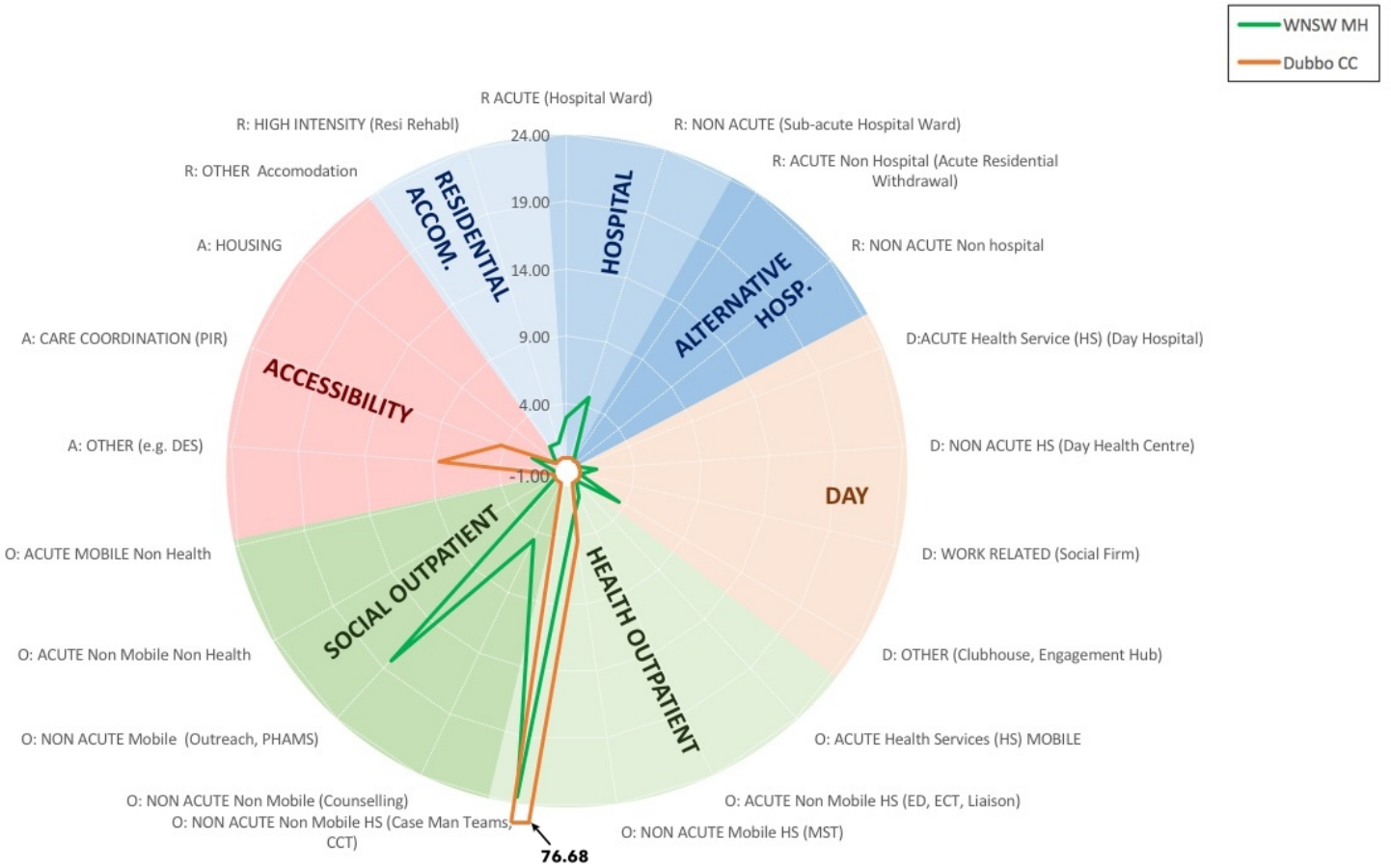


FIGURE 50 COMPARING PATTERNS OF CARE: MENTAL HEALTH VS. CHRONIC CARE

8. Discussion

Chronic disease affects approximately seven million people in Australia, is a major contributor to morbidity and premature mortality and represents a disproportionately large economic cost to the health system. Prevalence data presented in this Atlas highlights:

- The WNSW PHN region recorded higher proportions of circulatory, respiratory and endocrine related diseases when compared with NSW and national data.
- Premature mortality from respiratory disease and COPD is higher in Coonamble than any other LGA within the WNSW PHN region and higher than the PHN, state and national rates.
- Both Dubbo and Coonamble have rates of hospitalisation for COPD above the state average, with a recent spike observed in spatially adjusted hospitalisations in Coonamble.
- Dubbo showing a slight spike in diabetes related deaths in 2010-2011.
- PPH admissions data indicates that the Bourke-Cobar-Coonamble SA3 area has higher aged standardised rates of preventable hospitalisations for COPD, heart failure and Diabetes.
- There was an average of 526 chronic disease separations per year at Dubbo Base Hospital between 2006/07 and 2010/2011.

These figures highlight the significance of chronic disease across Dubbo, Coonamble and the WNSW PHN region. It is one of the nine priority areas identified by the WNSW PHN in its Needs Assessment. Further, chronic disease is closely linked, if not inextricably related, to almost all the other eight priority areas, especially Aboriginal health, mental health, service coordination, integration and collaboration.

Multi-morbidity of chronic disease is not uncommon and is especially prevalent in those with serious mental illness, further strengthening the case for a more integrated, multidisciplinary approach to service provision and self-management.

As part of the Better Outcomes for People with Chronic and Complex Health Conditions report, this complexity and requirement for integrated care was placed front and centre of chronic disease policy formation moving forward (Primary Health Care Advisory Group, 2016). The report advanced a reform agenda that included the Health Care Home model of care, where the patient can receive enhanced access to holistic coordinated care, and wrap around support for multiple health needs. WNSW PHN is in the process of commissioning chronic disease management and care services built upon the principles of Health Care Homes and service innovation.

Models of care, however, cannot stand alone as effective tools for the management and minimisation of chronic diseases in any given area. A sound knowledge of what services are currently available within any given catchment is necessary in planning, commissioning and coordinating chronic care. Integrated Atlases can provide this detailed service provision understanding.

The Integrated Atlas of Chronic Care for Dubbo and Coonamble is a project that takes the concept of Integrated Atlases and applies it to the provision of care for the chronic conditions of COPD, CVD and Diabetes. It reveals the DESDE methodology can be effectively applied to map chronic care services to facilitate a deeper understanding of the unique characteristics and the pattern of chronic care in a given area.

Further, the mapping and classification of chronic disease services across Dubbo and Coonamble reveals that:

- There is consistency with patterns of care provided in other rural and remote locations (e.g. Country Western Australia),

- There is a high level of outpatient, non-mobile services, but these are small or very small in capacity,
- There are relatively more chronic disease services (or 'teams') than mental health 'teams' per 100,000 population (139.21 vs. 89.45),
- There are no inpatient beds or wards specifically for treating chronic diseases in either Dubbo or Coonamble (e.g. a coronary care unit),
- There are no age-specific chronic disease services, rather services are generally open age,
- Chronic disease service provision is almost entirely clinical, delivered by the public health sector or private providers,
- Team sizes are extremely small, often less than one FTE and often run on set days or for blocks of hours rather than every day, and
- Services are 'hub and spoke' in many cases, meaning the service is based elsewhere or is provided by a 'visiting' clinician.

These findings and other key themes presented during this project are explored below.

Service Specialisation

The focus of this Atlas is quite specific, aiming to identify services that are specialised in treating COPD, CVD and Diabetes. In addition to these services, people with chronic disease will also receive treatment at general practices, in general and surgical wards at the hospitals, through emergency departments and from a range of other generalist allied health practitioners, such as Community Nurses or Optometrists for example. These generalist services are not the focus of this mapping.

Intensity

As might be expected, the specialised nature of the services mapped in this Atlas means that the level of intensity for these services is generally low. That is, patients who are seeing the specialised service will most likely be seeing them infrequently. For example, a patient may be referred to the Cardiopulmonary clinic in Coonamble on discharge from a hospital in Orange or Sydney. They might only visit the clinic once, and as such it is classified as a low intensity service. Others may use a service weekly for a short period, say six weeks. Generally, the ongoing management of their chronic disease will be done through their general practitioner and it is likely they will be visiting them much more frequently.

Mobility

One of the key principles of the CDMP is to enable the primary care sector to manage and support people with chronic disease as close to home as possible.

The services mapped in this Atlas were all based in the towns of Dubbo and Coonamble. They were largely Non-Mobile, that is, they were delivered from a fixed location, such as a clinic, hospital outpatient department or at a specialist's room. Very few services appeared to be visiting patients at home. Aboriginal Health Practitioners, the Community Care Coordinator for Chronic Disease Management and the Complex Care Nurse Practitioners are the exception to this.

Workforce

The workforce identified as providing specialised chronic disease services in Dubbo and Coonamble is very small. There was a total of 35.34 FTE reported across the two locations. Many of the teams identified are unitary, that is, single person or fractional teams. Many of the service activities they offer

are less than one day per week. This must be factored in when consideration is given to the service capacity across these two areas.

Small teams bring with them a unique set of challenges which are exacerbated by the rural and remote location. When a team consists of only one professional, the service they provide is severely compromised if they are absent for any reason. Waiting lists and large client lists may be a consequence. Additionally, if they leave the area, recruitment will be challenging.

In common with other remote areas, during this project interviewees reported that it can be difficult to attract and retain suitably qualified and experienced staff, threatening the sustainability of service provision. This is well-recognised and workforce is identified as a strategic priority area for both the PHN and the LHD. This issue is also the focus of research such as the recently released Research to Action Guide: 'A Sustainable Rural and Remote Workforce for Disability' (Dew et al, 2016).

Additionally, as services are recommissioned and structures or policies change, there will be reskilling and de-skilling issues. As an example, when specialist roles such as Diabetes Educators were introduced, the work that shifted to these roles moved away from other areas, such as community nursing and over time this will have resulted in some de-skilling of those nurses regarding that aspect of their work. If policy shifts occur that cause a decrease in this resource in the future, it may be necessary to re-skill staff to cover the resulting gap.

Service Structure and Placement Capacity

Another common feature of the service structure in remote and rural areas is the use of a 'hub and spoke' model of service provision. Main 'hubs' of staff are based in the larger towns and smaller 'spokes', offshoots of the hub are based, or in-reach into, the smaller regional towns. Where staff are based permanently at a spoke site, they may be supported by team leaders and administrative infrastructure from the hub site. This may include the provision of telehealth services with a range of specialists located in the hub service and accessed by professionals at the spoke site on an 'as needs' basis.

At other times, the spoke is purely a 'visiting' presence, such as a monthly clinic, or weekly three-hour session provided out of a local facility, such as the multi-purpose service or local AMS, for example. RFDS clinics are one example of a visiting 'spoke' service, the role of Complex Care Nurse Practitioner in Coonamble is another. Sometimes a visiting 'spoke' service is described as a 'node' and the hub and spoke becomes 'hub, spoke and node'.

The mapping and classification of these types of service systems is challenging. On one hand, it is important to identify that there is service provision available in the 'spoke' or 'node'. On the other hand, counting this as a service simplifies and overstates the true service capacity available in that area. This is one of the limitations of the current DESDE tool. The counting of BSIC or 'services' and the calculation of rates of these per 100,000 population weights all BSIC equally, no matter their size. This is where service commentary and context is critical in an Atlas as it provides perspective. It provides the colour and movement to the picture.

Interestingly, despite this limitation, or indeed because of it, the comparative analysis provided using the DESDE highlights its strength. Because the tool is applied with rigour and consistency across areas, similarities in patterns of care and rates of services become evident. High numbers of small teams in remote areas drive a unique shape in the pattern of care that is consistent across areas that share similar characteristics. This may not be as evident if the BSIC were weighted for scale.

The DESDE has now been applied across a large part of Australia, from large metropolitan cities such as Melbourne, Brisbane, Perth and Sydney, to very remote areas such as the Kimberley in Western Australia. It has been applied to the provision of long term care for mental illness, alcohol and other

drugs and even homelessness. The more it is utilised the more powerful is the ability to compare service structures and characteristics between areas and different service types.

Transport

As with workforce, transport challenges are also a common theme when speaking with services in the rural areas, particularly Aboriginal communities. Again, this is well understood by the PHN and LHDs. Telehealth is going some way to alleviating this burden, as it allows access to a range of specialist care that would otherwise not be available without significant cost or inconvenience to both patient and provider. The WNSW LHD is leading the way here with a telehealth trial site to be established in the new multi-purpose service facility to open in Cobar next year. However, additional flexibility and innovation is possible and the provision of care by Mental Health Nurse Incentive Program (MHNIP) nurses stands out as one example of this.

Currently a MHNIP nurse is unable to provide consultations over the telephone or via telehealth. Thus, patients might have to drive long distances to access the nurse. For some highly anxious or very depressed patients, this may not be possible, or at least not without considerable distress and risk. There were examples provided during the project of cases where nurses have had to talk a distressed and suicidal patient through a long drive.

NDIS

The NDIS rolls out across the region in July 2017, the impact of which remains unclear. It is unlikely it will significantly impact the provision of clinical care for chronic diseases, however a flow on effect caused by the range of pressures it will place on NGOs such as the Aboriginal Controlled Health Organisations is likely. Aboriginal health services report they are working closely with the NDIS to facilitate its introduction to the area.

Service Stability

The funding and delivery principles for the PHN state clearly that the services it funds, “will only address gaps that other publicly funded services, Commonwealth and State, are not providing (including other PHN funded activities i.e. Integrated Team Care initiatives)” (WNSW PHN, 2017).

PHN funding cycles are generally only 12 months in length and they are deliberately flexible in their focus. This enables the PHN to shift service focus as needs change, to be adaptive and flexible to best meet the needs of the people in the region.

During this project, there were services that have been or are in the process of being recommissioned by the WNSW PHN. New service contracts are in the process of coming online. As such, some services interviewed at the commencement of the project could not be described as ‘stable’ because they had their funding discontinued later during the project and some newer services may likewise not yet be regarded as ‘stable’ longer-term.

Given the increasing devolvement of state and federal funding to LHD and PHNs at a regional level and the introduction of the NDIS, there is a large question mark against service stability. Short-term funding cycles put services and staff under significant pressure. This environment is particularly difficult for smaller NGOs, who often do not have the scale, skills and resources to effectively manage competitive tendering, buffering for uncertain financial flows and addressing other commercial imperatives such as marketing and digital communication. Ultimately, the impact here will be felt by both staff and patients, as increased casualisation and instability of the workforce may be a potential consequence.

Compliance

It is evident that patients with chronic disease are impacted by a range of complex factors including issues with housing, substance use and mental illness, domestic violence and low incomes. Such

issues make it difficult to gain consistent adherence to treatment regimes. Appointments get missed, patients fail to engage or stay engaged. The ‘dots’ between services supporting the patient do not always get joined up.

This is reflected in the retention of patients in chronic care programs. In the WNSW LHD region, of those referred to respiratory rehabilitation services in the 2010-11 financial year (n = 468), only 292 commenced a program of care, with only 188 completing a full course of rehabilitation (WNSW LHD, 2012). For cardiac rehabilitation, the trajectory of dropout was similar, with 1,252 referrals, 552 rehabilitation commencements and just 347 patients completing a full course of cardiac rehabilitation (WNSW LHD, 2012).

As such, the importance of assertive case management and care-coordination cannot be underestimated, as is the importance of supporting approaches that build out a holistic model of care incorporating education, early intervention and prevention and psychosocial support including support for behavioural change.

In a UK study of several care-coordination models, researchers outlined the key characteristics of care coordination that may be transferable across diverse contexts (Goodwin et al, 2013). At a service level, named care coordinators were necessary for patients to have a familiar and consistent point of contact who would coordinate care. Furthermore, and perhaps relevant to the rural and regional nature of the WNSW PHN region, the ability for care coordinators to be familiar and connected to local communities was important for legitimacy, trust and community awareness concerning chronic conditions (Goodwin et al, 2013). The concept of a nurse navigator has been advanced here in Australia, particularly as a pivot point within interdisciplinary teams to support those transitioning from acute to continuing care - empowering patients to navigate a complex system and self-manage their condition at home (McMurray and Cooper, 2017).

Chronic disease and Mental Health

There is an established link between mental illness and other chronic diseases. People with mental illness experience higher rates of chronic disease, particularly those with severe mental illness. Furthermore, people with severe mental illness die earlier due to poor physical health.

People with chronic disease also experience issues related to their mental health. Chronic disease has an impact on all areas of a person’s life. It can affect work, relationships and mental health. Depression and anxiety are common when people are affected by chronic disease. For example, it is estimated that depression affects nearly half of those with chronic kidney disease (SANE Australia, 2017).

The level of integration between mental health and chronic care teams was not a focus for this atlas, however it should be noted that mental health and chronic care services may benefit from some form of integration. This may come in the form of integrated data collection, referral pathways, shared care planning and patient defined recovery planning. The cyclic nature of chronic care and mental illness affecting one another demands the integration of primary care services. The concurrent mental health atlas project being undertaken for WNSW PHN can be read in conjunction with the Dubbo and Coonamble chronic care atlas to identify synergies and opportunities for integration of mental health and chronic care across the two LGAs.

9. Study Limitations

There are several limitations that should be acknowledged.

Services may be missing because they were not able to be reached. Some organisations did not respond to requests for interview or survey invitations. Additionally, it is possible that others were overlooked in the creation of the initial stakeholder lists. It should be noted that services may have been excluded from the final data not because they were missed but rather because they do not meet Atlas criteria.

Some services are not included because they are not specialist chronic disease services. These generalist services may still treat people with chronic disease, however they are not included as they do not specifically target these issues. The DESDE methodology must be applied with rigour and consistency to ensure the accuracy of comparative data. The ability to make cross-comparisons with other areas both nationally and internationally is one of the key strengths of the tool. This necessarily means some more generalist services are excluded from analysis. This is particularly pertinent to this Atlas when considering the nature of services provided into remote and rural communities, including AMSs and some (not all) of the generalist community services, prevention and early intervention services and remote multi-purpose-services. To fully appreciate the depth and complexity of these services, it would be necessary to do further analysis on the activities these groups, something which could be achieved by mapping modalities of care.

Private providers are generally not included in an Atlas, as it is focused on services with a minimum level of universal accessibility (that is, services must be free). As such, private providers are generally only included where they are providing free services (for example via bulk billing). The inclusion of private providers in the mapping of publicly available services is considered to increase noise and possibly distort the interpretation of results. It might also misrepresent the universality of access to services.

The assessment of services was made through a process of telephone interviews, data provided by services and through email correspondence. Some information may not have been provided before the cut-off date, some information may have been misinterpreted, or contain inaccuracies and some assumptions may have been required to finalise a code or classification.

It is noted that the data collection period for this Atlas took place during a time of substantial change in the funding environment including the recommissioning of some services by the PHN, the restructure of the WNSW LHD and the introduction of the NDIS.

The Atlas focuses only on services provided from a base within the WNSW PHN region. It is acknowledged that there are services that residents of the PHN will use that may be outside of this catchment (e.g. Mildura).

The Atlas compares the rates of beds, places and the numbers of teams (BSIC) per 100,000 population across the area of focus. These rates are then compared with other types of care and other areas across Australia and internationally. However, when comparing the rates of teams, it is important to understand the size of these teams to get the most accurate assessment of the capacity of the services in the area of focus. Therefore, additional effort has been applied to exploring the size of teams with additional commentary provided to add further depth to the analysis (where data on FTE was available).

10. Future Steps

This Atlas comprehensively mapped the stable services providing care for people living with COPD, CVD or Diabetes in Dubbo and Coonamble, NSW. It uses publicly available socio-demographic information on the population and other characteristics for these towns and for the WNSW PHN region.

The WNSW PHN region is a large region, with a wide variation in characteristics across and within the LGAs within it. The rural and remote areas and large Aboriginal populations present additional complexity.

This Atlas is the first application of the DESDE methodology to the provision of care for COPD, CVD and Diabetes in Australia. It provides a comprehensive assessment and analysis of the services provided within the Dubbo and Coonamble area. It is anticipated this draft of the report will be discussed in detail with the WNSW PHN and key stakeholders prior to forming a consensus view as to possible future applications, extensions or additional analysis that might further enhance and compliment the information it provides.

11. Conclusion

Integrated Atlases are a key tool for evidence informed service planning and policy development. They are not a service directory or gazette of services. This Atlas included comprehensive mapping of services identified as stable and specifically tailored for the treatment of chronic disease in Dubbo and Coonamble.

This Integrated Atlas of Chronic Disease for Dubbo and Coonamble is a snapshot of a pivotal point in time and a starting point for further discussion across the region. It supports the application of the DESDE methodology to the analysis and mapping of the provision of chronic care in an area, facilitating as it does the comparative analysis of the unique patterns of care found in remote and rural areas, across different types of care (for example with mental health care, AOD and homelessness care). Further, it provides a great opportunity to harness this local evidence to innovate and improve existing service systems for the benefit of the local community.

Used in conjunction with the Regional Needs Analysis and the Integrated Mental Health Atlas of Western NSW, it provides an insight into the potential application this invaluable tool to identify and visualise service gaps to contribute to evidence informed service planning and policy development.

Appendix A

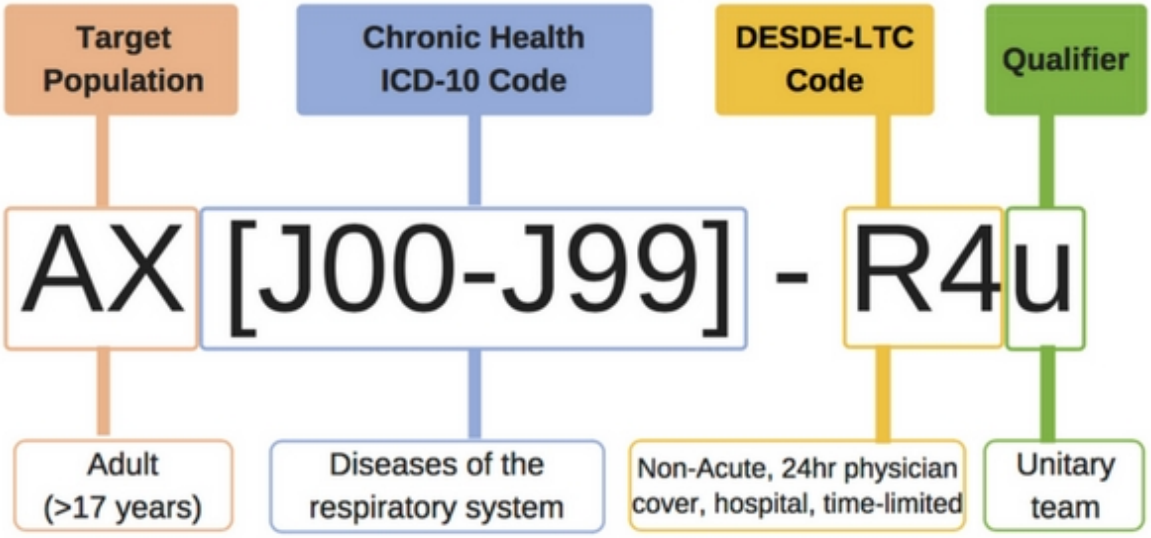
Stakeholder List

Chronic Care Stakeholder List - WNSWPHN		
Activate Physiotherapy Centre	Bila Muuji	Bawrunga Aboriginal Medical Service - Dubbo
Cardiac Clinic	Care Cottage Dubbo - Dubbo Family Doctors	Cobra Street Centre
Cobra Street Podiatry Centre	Coonamble Aboriginal Health Service	Dubbo Community Health Centre - Chronic and Complex Care
Dubbo Community Health Centre - Dietician	Dubbo Community Health Centre - Occupational Therapy	Dubbo Community Health Centre - Psychologist
Dubbo Diabetes Unit - Betty Orth Memorial Centre	Dubbo Eye Care	Dubbo Health Service - Dietetics Clinic
Dubbo Health Service - Physiotherapy Department	Dubbo Health Service - Aboriginal Health Chronic Care Service	Dubbo Health Service Cardiology Clinic - Specialist Medical Centre
Dubbo Health Service Chronic Care Service - Cardiopulmonary Rehabilitation	Dubbo Health Service - Diabetes Education Service	Dubbo Medical and Allied Health Group
Dubbo Medical Specialist - Endocrinology	Dubbo Regional Aboriginal Medical Service	Interact Injury Management
Jenny Rodway Physiology	Dubbo Family Dentists	Macquarie Foot Clinic
Marathon Health	Max Astri Optometrist Eyecare Plus	Morrison's Family Eye Care Centre
OPSM	Paula O'Leary Physio	Precision Healthcare and Rehabilitation
Recover - Dubbo	Smile Design Centre	Sydney Eye Care - Dubbo
Tim Manning Psychology Services (Bettalife Solutions)	Tim Morris Podiatry	Western Plains Medical Centre
LHD Oral Health	Wingewarra Dental	

Appendix B

DESDE-LTC Quick Reference Guide

DESDE-LTC Quick Reference Guide



Age Codes

GX All age groups
NX None/Undetermined
CC Only children (0-11 years)
CA Only adolescent (12-16 years)
CX Child & adolescents (<18 years)
CY* Adolescents and young adults (12-25 years)
TA Period from adolescent to adult (16-24 years)
AX Adults (18-65 years)
TO Period from adult to older adult (60-70 years)
OX Older adult (>64 years)

In analysis section, age codes are grouped as follows:
Children and adolescents (including young adults) - Codes CC, CA, CX, CY and TA
Adults (including services with no age specification) - Codes AX and GX
Older adults - Codes TO and OX

* CY is a new DRAFT code utilised in this Atlas based on the unique service characteristics in Victoria.

DESDE-LTC Codes

R
Residential Care
D
Day Care
O
Outpatient Care
A
Accessibility to Care
I
Information for Care
S
Self-Help and Voluntary Care

Diagnostic Groups

I00-I99 Diseases of the circulatory system
J00-J99 Diseases of the respiratory system
E08-E13 Diabetes Mellitus
Z13.1 Encounter screening for diabetes mellitus
Z83.1 Family history of diabetes mellitus
ICDc Used where there is not a specific diagnostic group for this chronic care service

Qualifiers

a - Acute care (complimentary) - Used where acute care is provided within a non-acute, non-residential setting but does not fit the criteria for the addition of a second MTC .

d - Domiciliary care - Denotes this service is provided wholly at the home of the service user

e - eCare - Includes all care services relying on telephone, modern information and communication technologies (ICTs) (e.g. telecare/telemedicine, teleconsultation, teleradiology, telemonitoring)

g* - Group - This DRAFT qualifier is applied to outpatient services that provide predominantly group activities and do not meet the criteria for a Day Care service (Typically 80% of their activity is through the provision of groups)

h - Hospital (Care provided in a hospital setting) - Describes non-residential MTCs ("O" or "D") provided within the hospital setting

j - Justice care - Describes BSICs whose main aim is to provide care to individuals in contact with crime and justice services

l - Liaison care - Describes liaison BSICs where specific consultation for a subgroup of clients from another area within the facility, e.g. mental health care to a cancer ward of a hospital

m - Management – Describes an MTC where management, planning, coordination or navigation of care a core part the provision of their outpatient care

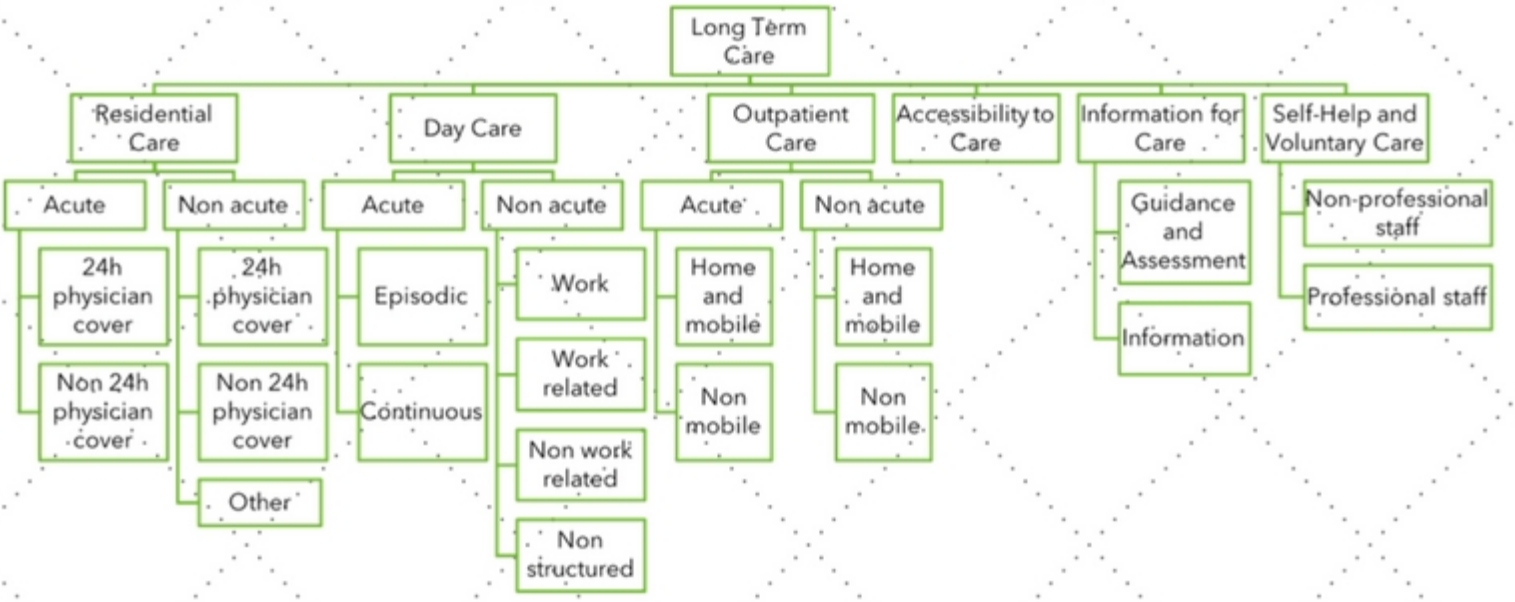
r - Reference – describes a MTC which operates as the main intake or referral point for the local area

s - Specialised care - Describes BSICs for a specific subgroup within the target population of the catchment area (e.g. eating disorders service)

t - Tributory – Describes an MTC that is a satellite team dependant on another main care team

u - Unitary care - Describes an MTC that is a satellite team dependant on another main care team

v - Variable – Service is subject to strong limitations of capacity or fluctuations in demand



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MTC Codes

Residential Care

R0 Acute, 24-hours physician cover, non-hospital
R1 Acute, 24-hours physician cover, hospital, high intensity
R2 Acute, 24-hours physician cover, hospital, medium intensity
R3.0 Acute, non 24-hours physician cover, hospital
R3.1 Acute, non 24-hours physician cover, non-hospital, health related care
R3.2 Acute, non 24-hours physician cover, non-hospital, other
R3.2.1 Acute, non 24-hours physician cover, non-hospital, other, 24 hour care
R3.2.2 Acute, non 24-hours physician cover, non-hospital, other, Daily care
R3.2.3 Acute, non 24-hours physician cover, non-hospital, other, lower care
R4 Non-acute, 24-hours physician cover, hospital, time limited
R5 Non-acute, 24-hours physician cover, non-hospital, time limited
R6 Non-acute, 24-hours physician cover, hospital, indefinite stay
R7 Non-acute, 24-hours physician cover, non-hospital, indefinite stay
R8 Non-acute, non 24-hour physician cover, time limited, 24 hours support
R8.1 Non-acute, non 24-hour physician cover, time limited, 24 hours support, less than 4 weeks stay
R8.2 Non-acute, non 24-hour physician cover, time limited, 24-hours support, over 4 weeks
R9 Non-acute, non 24-hours physician cover, time limited, daily support
R9.1 Non-acute, non 24-hours physician cover, time limited, daily support, < 4 weeks
R9.2 Non-acute, non 24-hours physician cover, Time limited, Daily Support, > 4 weeks
R10 Non-acute, non 24-hours physician cover, time limited, lower support
R10.1 Non-acute, non 24-hours physician cover, time limited, lower support, < 4 weeks
R10.2 Non-acute, non 24-hour physician cover, time limited, lower support, > 4 weeks
R11 Non-acute, non 24-hours physician cover, indefinite stay, 24-hours support
R12 Non-acute, non 24-hours physician cover, indefinite stay, daily support
R13 Non-acute, non 24-hours physician cover, indefinite stay, lower support
R14 Non-acute, other non-acute

Outpatient Care

O1 Acute, home & mobile, 24 hours support
O1.1 Acute, home & mobile, 24 hours support, health related care
O1.2 Acute, home & mobile, 24 hours support, other Care
O2 Acute, home & mobile, limited Hours
O2.1 Acute, home & mobile, limited Hours, other care
O2.2 Acute, home & mobile, limited Hours, health related care
O3 Acute, non-mobile, 24 hours support
O3.1 Acute, non-mobile, 24 hours support, health related care
O3.2 Acute, non-mobile, 24 hours support, other care
O4 Acute, non-mobile, limited hours
O4.1 Acute, non-mobile, limited hours, health related care
O4.2 Acute, non-mobile, limited hours, other care
O5 Non-acute, home & mobile, high intensity
O5.1 Non-acute, home & mobile, high intensity, health related care
O5.1.1 Non-acute, home & mobile, high intensity, health related care, 3/6 days per week
O5.1.2 Non-acute, home & mobile, high intensity, health related care, 7 days per week
O5.1.3 Non-acute, home & mobile, high intensity, health related care, 7 days per week including overnight
O5.2 Non-acute, home & mobile, high intensity, other care
O5.2.1 Non-acute, home & mobile, high intensity, other care, 3/6 days per week
O5.2.2 Non-acute, home & mobile, high intensity, other care, 7 days per week
O5.2.3 Non-acute, home & mobile, high intensity, other care, 7 days per week including overnight
O6 Non-acute, home & mobile, medium intensity
O6.1 Non-acute, home & mobile, medium intensity, health related care
O6.2 Non-acute, home & mobile, medium Intensity, other care
O7 Non-acute, home & mobile, low intensity
O7.1 Non-acute, home & mobile, low Intensity, health related care
O7.2 Non-acute, home & mobile, low Intensity, other care
O8 Non-acute, non-mobile, high intensity
O8.1 Non-acute, non-mobile, high intensity, health related care
O8.2 Non-acute, non-mobile, high intensity, other care
O9 Non-acute, non-mobile, medium intensity
O9.1 Non-acute, non-mobile, medium intensity, health related care
O9.2 Non-acute, non-mobile, medium intensity, other care
O10 Non-acute, non-mobile, low intensity
O10.1 Non-acute, Non-mobile, low intensity, health related care
O10.2 Non acute, non-mobile, low intensity, other care
O11 Other non-acute outpatient care

Day Care

D0 Acute, episodic
D0.1 Acute, episodic, high intensity
D0.2 Acute, episodic, other intensity
D1 Acute, continuous
D1.1 Acute, continuous, high intensity
D1.2 Acute, continuous, other intensity
D2 Non-acute, work related, high intensity
D2.1 Non-acute, work, high intensity, ordinary employment
D2.2 Non-acute, work, high intensity, other work
D3 Non-acute, work related care, high intensity
D3.1 Non-acute, work related care, high intensity, time limited
D3.2 Non-acute, work related care, high intensity, time indefinite
D4 Non-acute, non-work structured care, high intensity
D4.1 Non-acute, non-work structured care, high intensity, health related
D4.2 Non-acute, non-work structured care, high intensity, Education related care
D4.3 Non-acute, non-work structured care, high intensity, social and cultural related care
D4.4 Non-acute, non-work structured care, high intensity, other non-work structured care
D5 Non-acute, non structured care, high intensity
D6 Non-acute, work, low intensity
D6.1 Non-acute, work, low intensity, ordinary employment
D6.2 Non-acute, work, low intensity, other work
D7 Non-acute, work related care, low intensity
D7.1 Non-acute, work related care, low intensity, time limited
D7.2 Non-acute, work related care, low intensity, time indefinite
D8 Non-acute, non-work structured care, low intensity
D8.1 Non-acute, non-work structured care, low intensity, health related care
D8.2 Non-acute, non-work structured care, low intensity, education related care
D8.3 Non-acute, non-work structured care, low intensity, social and cultural related care
D8.4 Non-acute, non-work structured care, low intensity, other non-work structured care
D9 Non-acute, non-structured day care
D10 Other non-acute day care

Information & Guidance

I1 Guidance and assessment
I1.1 Professional assessment and guidance related to health
I1.2 Professional assessment and guidance related to education
I1.3 Professional assessment and guidance related to social and cultural issues
I1.4 Professional assessment and guidance related to work
I1.5 Professional assessment and guidance related to other (non-work)
I2 Information
I2.1 Information provided through interaction
I2.1.1 Information provided through interaction - face to face
I2.1.2 Information provided through interaction - other
I2.2 Information, non-interactive

Accessibility to Care

A1 Access to communication
A2 Access to physical mobility
A3 Access to personal accompaniment
A4 Case coordination
A4.1 Case coordination, acute care
A4.2 Case coordination, non-acute care
A4.2.1 Case coordination, non-acute, high intensity
A4.2.2 Case coordination, non-acute, medium intensity
A4.2.3 Case coordination, non-acute, low intensity
A5 Other accessibility care
A5.1 Access to health services
A5.2 Access to Education and Training
A5.3 Access to social and cultural relations
A5.4 Access to employment
A5.5 Access to housing

Self-help & Volunteer

S1 Non-professional unpaid staff
S1.1 Non-professional unpaid staff, information on care
S1.2 Non-professional unpaid staff, accessibility to care
S1.3 Non-professional unpaid staff, outpatient care
S1.4 Non-professional unpaid staff, day care
S1.5 Non-professional unpaid staff, residential care
S2 Professional staff
S2.1 Professional staff, information on care
S2.2 Professional staff, accessibility to care
S2.3 Professional staff, outpatient care
S2.4 Professional staff, day care
S2.5 Professional staff, residential care

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We acknowledge that we work on the traditional lands of many Aboriginal clans, tribes and nations. We commit to working in collaboration with our region's Aboriginal communities and peoples to improve their health, emotional and social wellbeing in the spirit of partnership.