Equity of access for rural health services –
 mapping of community-based services

Anne Lea, Mid Western Area Health Service, Orange

ABSTRACT

A review of community based health services within the Mid Western Area Health Service (MWAHS) was conducted in 1999. To address the lack of equity in the distribution of community health services and gaps in services demonstrated by this review, a service mapping exercise was undertaken. This has resulted in the development of a community health model that aims to; improve access to community health services and promote the efficient use of available resources through the networking of services, and provide communities (where possible), with access to allied health services within 50 kilometres.

Several methods of weighting populations were investigated. Those chosen were based on weighting formulae utilised by the NSW Department of Health in the Resource Distribution Formula (age distribution and Aboriginality) and that used by the NSW Board of Adult and Community Education (population density and post secondary education). The population for each town was standardised based on the average weight for the MWAHS.

Minimum service levels were defined taking into consideration the population base, equity of access and distance from other services. Nursing and allied health services were then allocated to sites based on current “average” provider to population ratios. The staffing allocation formulae varied according to the level of the service due to the increased availability of allied health, general practitioners (GPs), hospital services and other local services in larger centres. Service Networks were identified based on client flows, geographic location and role delineation. These networks will facilitate the co-ordination of service provision across levels, assist in formalising clinical and professional support systems for service providers, and promote continuity of client care.

This model should be seen as a starting point for improved distribution of health services and better use of resources within the MWAHS. The greatest impact will be on the community itself who will have increased access to health care.

INTRODUCTION

Community-based health services within Mid Western Area Health Service (MWAHS) are undergoing significant change (as is the rest of the Area health service). The current economic and political climate has driven the change process both externally and internally. The release of the Government Plan of Action for Health in 2000 and the NSW Rural Health Report in 2002, have set clear strategic directions for future service provision at a macro and micro level. The MWAHS in keeping with Strategic Directions for Health 2000–2005 is actively planning to provide accessible, quality
services based on the needs of the population, and developed in consultation with the community of interest.

To address the lack of equity in the distribution of community health services, demonstrated in a 1999 review of community based health services, a service mapping exercise has been undertaken. This has resulted in the development of a model for service distribution. The purpose of this model is to improve access to community based services though the equitable distribution of services, promote the efficient use of available resources through the networking of services, provide all communities with access to locally based nursing services and ensure, where possible, that communities have access to allied health services within 50 kilometres. This model will provide a strategic framework for the planning, resourcing and delivery of community health care services within the MWAHS.

This paper will describe the model, its development and the implications for the future delivery of community health services within the MWAHS.

BACKGROUND

The MWAHS catchment area and population

The MWAHS is one of 8 rural health services in NSW. It includes 13 Local Government Areas (LGAs) and is located in the central west of NSW, serving a diverse geographical area of 54 805 square kilometres. It extends from the foot of the Blue Mountains to the western plains country around Lake Cargelligo, sharing its borders with Wentworth, Greater Murray, Macquarie and Southern Area Health Services.

The MWAHS is responsible for the health of 171 366 residents. Over half of this population is concentrated in the eastern LGAs of Bathurst, Orange and Greater Lithgow. The remaining population is widely dispersed in smaller rural centres. The population shares the characteristics of most rural populations.

When compared with NSW, the area has a high proportion of children and young adults less than 20 years of age (31.5%) and a low proportion of adults aged between 20 and 40 years (27.6%). This trend is exaggerated in the more isolated areas as young adults migrate to less remote areas to gain education and employment. The proportion of people aged 65 years and over has increased dramatically from 8.4% in 1972 to 12.5% in 1996 and is expected to increase to 17.3% by the year 2021.5,6

Health status of the people of MWAHS

The Area has adverse economic and social factors relating to poorer levels of health in some communities. The average income is lower than that of NSW and though the unemployment status is similar to NSW it varies widely across the Area. According to the “Socio-Economic Indexes for Areas”, MWAHS is worse off compared to NSW as a whole.

The death rates for residents in the MWAHS are approximately 13% higher for males and 9% higher for females, compared with NSW rates. Leading causes of death are
Heart disease, cancer, respiratory disease, injury and poisoning. Road trauma is a major contributor to excessive injury rates.

There are considerable health issues relating to 3.2% of the population identifying themselves as being part of the Aboriginal and Torres Strait Islander (ATSI) community. This community has higher excess mortality, higher rates of hospitalisation and experiences problems with accessing and using health services.

**Health services within the MWAHS**

The Area is serviced by 22 acute public hospitals, 3 private hospitals, a major psychiatric hospital, one public nursing home and 37 community health centres.

Community or primary health care services are spread across the Area from the major centres to small villages. The largest multi-disciplinary community health teams are located in Orange and Bathurst. These teams and those from the larger centres of Parkes, Forbes, Cowra and Lithgow, provide outreach and visiting services to smaller towns and villages on a regular basis.

**THE PROBLEM**

The emergence of the Community Health Program in the 1970s saw health centres located in towns with hospitals and in other sites where “baby health nurses” conducted clinics. Subsequent resourcing of these centres has been based on original allocations, community lobbying and the ability (or not) of individual services to attract additional resources. Currently some communities are well serviced while others have limited access to services. Compounding access issues are historical limits on the boundaries serviced and the scope of services provided by individual clinicians.

**DEVELOPMENT OF THE MODEL**

**The working party**

A working party was convened to map existing community health services and develop a model for the future resourcing and distribution of services. This working party consisted of community health managers, the Area Director of Health Service Development, the Manager of Primary Health Care and the Manager of Clinical Services Development.

Wide consultation within the MWAHS was also undertaken and included allied health advisers, health service managers and community health workers. Information from local health planning and associated community focus groups was also reviewed. A literature search was conducted to investigate methods of population weighting for resource distribution. Limited information was available.
Determining service needs

The working party brainstormed factors that impacted on health status and the need for community health services. Though difficult, the group tried to ignore the location and function of existing services and focus on the question — “if we were starting from scratch, where would services best be located and what would these services look like?” Many potential indicators of need were identified and discussed. These included the population size, specific age categories, Aboriginality, socio-economic status, isolation or distance from large centres, mortality and morbidity rates and the availability of other services such as general practitioners (GPs) and government and non-government agencies.

Weighting methods

The weighting methods chosen for use were based on weighting formulae utilised by the NSW Department of Health in the Resource Distribution Formula and that used by the NSW Board of Adult and Community Education. The selection of these methods was based on the availability of data, their ability to be reproduced and their prior testing. Weightings were applied to both LGAs and individual populations. It was decided that weighting LGAs was not sufficient due to the heterogeneity of towns within LGAs. Weighting of individual towns, though more difficult, provided more useful information. The weighting methods used the sum of the group weights was called the adjusted urban centre population.

Weighting for Aboriginality and age

Population numbers and characteristics for each urban centre based on 1996 Australian Bureau of Statistics (ABS) data were obtained. (Population profiles based on postcodes were not readily available). The different population groups in each urban centre were weighted using the NSW Health Department formulae — see Table 1. The sum of the group weights was referred to as the adjusted urban centre population.

By dividing the adjusted urban centre population by the actual urban centre population, a weighting, which could be used to rank and compare locations, was derived. This was called the “Aboriginal-Age weight”.

Table 1 NSW Health formulae for weighting population groups

<table>
<thead>
<tr>
<th>Population group</th>
<th>Weighting formulae</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = Total aboriginal population</td>
<td>Multiply by 1.5</td>
</tr>
<tr>
<td>B = Total population aged 14 years or less</td>
<td>Multiply by 3</td>
</tr>
<tr>
<td>C = Total population aged 65 years or more</td>
<td>Multiply by 4</td>
</tr>
<tr>
<td>D = Total population aged between 15–64 years</td>
<td>Multiply by 1</td>
</tr>
</tbody>
</table>

Example 1

If town X has a total population of 200, 20 of these are Aboriginal, 50 are 65 years of age or more, 50 are 14 years of age or less and 100 are aged between 15 and 64 years the population groups would be weighted as follows:

Aboriginal 20 x 1.5 = 30
65 years or more 50 x 4.0 = 200
14 years or less 50 x 3.0 = 150
15 to 64 yeras 100 x 1 = 100

Total (adjusted urban centre population) = 480
Aboriginal and age weight = 480/200 = 2.4

Populations were not weighted for people from non-English speaking backgrounds. The proportion of people from non-English speaking countries living in the MWAHS is low (3.1%) compared to NSW (14.9%). Only 53 people were recorded as not speaking English well in the 1996 Census.10

BACE weighting method

The Board of Adult and Community Education (BACE) weighting was then introduced. By including levels of post secondary education, this weight provided an additional measure of socio-economic disadvantage. It also included a measure of population spread. These weights had already been determined for postcode locations.

The average Aboriginal-Age weight and the average BACE weight for the MWAHS were calculated. The Aboriginality-Age weight for each location was then added to its BACE weight. By dividing the combined weights of each location by the combined MWAHS average weight, weights were standardised. The standardised weighted population for each location was then derived by multiplying the postcode population by its standardised weight — see Table 2.

Table 2 Formulae for standardised population weighting

<table>
<thead>
<tr>
<th>Standardised weight</th>
<th>= postcode weight A + postcode weight B</th>
<th>MWAHS weight A + MWAHS weight B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardised weighted population</td>
<td>= postcode population x standardised weight</td>
<td></td>
</tr>
</tbody>
</table>

Key:
Weight A = Aboriginal and Age Weight
Weight B = Post Secondary Education and Population Density Weight Average of Wt

Limitations of weighting methods

The Aboriginality-Age weight was based on urban centre population information. The lack of readily available data on population characteristics based on postcodes, required an assumption that the characteristics of the postcode population were similar to those of the urban centre population. For some small postcode locations data was not available on the population distribution. Therefore, the Aboriginality-Age weight of the nearest small centre was applied, based on the assumption that their population distributions would be similar.
Reproducible weighting formulae for isolation or standard mortality rates were not available for inclusion and weighting for socio-economic disadvantage was limited to Aboriginality and levels of post secondary education.

**Service level delineation**

Towns were then ranked according to their standardised weighted population numbers.

Four groupings based on these rankings were decided upon.

<table>
<thead>
<tr>
<th>Service Level</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Standardised population of less than 2000</td>
</tr>
<tr>
<td>Level 2</td>
<td>Standardised population of 2000–7000</td>
</tr>
<tr>
<td>Level 3</td>
<td>Standardised population of 7001–20000</td>
</tr>
<tr>
<td>Level 4</td>
<td>Standardised population of more than 20000</td>
</tr>
</tbody>
</table>

Distance from a major city and distance from a town with a population of 1500 people or more, were also considered for each location. This resulted in networking some centres due to their close proximity and the linking of some smaller isolated communities to form a higher level of service.

Service levels were then defined taking into consideration, the population base, equity of access and distance from other services. The levels outlined below are considered to be minimum standards and are not intended to restrict service delivery. They differ from the role levels for Community Health outlined in the NSW Health Role Delineation Document, being more specific for rural health services.\(^1\)

**Level 1 community health service**

A level 1 community health service will have locally available primary care nursing services that include domiciliary nursing and child and family health. An Aboriginal health education officer/health worker (AHEO) will be available where required.

The service will have access to consultative services including, Area program managers, clinical nurse consultants and allied health advisers. The service providers will engage in community development and health improvement initiatives and participate in quality improvement activities.

**Level 2 community health service**

A level 2 service will meet the requirements for a level 1 service. Outreach programs and services will also be available based on need. These will include, counselling, physiotherapy, dietetics, speech pathology, occupational therapy, mental health, aged care assessment, dental health, women’s health, palliative care and rehabilitation services.

The service providers will engage in formally evaluated community development programs and structured quality improvement programs. They will provide outreach primary care nursing services to level 1 centres as required.
**Level 3 community health service**

A level 3 service will meet the requirements of a level 2 service and in addition provide locally based programs and services including; counselling, alcohol and other drugs, dietetics, physiotherapy, occupational therapy, speech pathology and women’s health. Regular outreach services visiting the town will include area services such as cancer care, aged care assessment and child protection.

A level 3 service will network their services as appropriate with other level 3 services to ensure the efficient use of available resources. Clinicians will engage in comprehensive community development programs with formal outcome evaluation and provide outreach services including allied health and nursing services to level 1 and 2 services.

**Level 4 community health service**

A level 4 service will meet the requirements of a level 3 service and have designated specialist teams/services including, an aged care assessment team (ACAT), a brain injury team, a cancer care and palliative care service, a sexual health service, a sexual assault team, and a genetic counselling service. Clinicians and teams will provide outreach services to all other levels as appropriate.

Level 4 services will network with each other to allow the sharing and efficient use of highly specialised services and resources.

**Community health networks**

Service networks or groupings of services were defined, taking into account different service levels, geographical locations and current referral and client flow patterns. Formalised linkages between all service levels will be established and supported by service agreements.

It is proposed that the development of these networks will allow:

- improved access to all levels of community based health services
- a single point of entry to community health services
- improved access to allied health services
- the co-ordination of service provision across levels
- sharing of resources such as equipment, information, clinical expertise and community education programs
- clinical support for service providers, reducing professional isolation.
THE ALLOCATION OF NURSING AND ALLIED HEALTH CLINICIANS TO COMMUNITY HEALTH SERVICES

Nursing services

To provide an equitable distribution of nursing services, current numbers of full-time equivalent (FTE) primary care nursing positions for each community were identified. This included generalist community nurses (including enrolled nurses), child and family health nurses, and domiciliary nurses. Nurse managers, clinical nurse consultants, community midwives and nurses attached to specific programs were not included in these numbers. This exercise further illustrated the inequity in the current distribution of these clinicians.

The average ratio of primary care nursing services to both postcode and standardised populations were determined for each service level. The agreed formulae for the equitable distribution of existing positions have been derived from the average of these two ratios.

Formulae differ according to service levels with decreased nurse to population ratios for smaller communities. This reflects the recognition of a need for increased services in communities where services such as allied health, general practitioners, hospital services and other health related community services are not available.

Table 4 Ratios for the equitable distribution of primary care nursing services

<table>
<thead>
<tr>
<th>Service</th>
<th>Number of primary care nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>1 full-time equivalent per 1000 standardised population</td>
</tr>
<tr>
<td>Level 2</td>
<td>1 full-time equivalent per 1500 standardised population</td>
</tr>
<tr>
<td>Level 3</td>
<td>1 full-time equivalent per 1800 standardised population</td>
</tr>
<tr>
<td>Level 4</td>
<td>1 full-time equivalent per 1900 standardised population</td>
</tr>
</tbody>
</table>

These ratios are based on current staff establishments and provide a guide to the distribution of existing staff. They are not recommendations for minimal or optimal staffing levels. The determination of appropriate ratios requires further analysis of the utilisation of services, needs identification and prioritisation through local health planning and discussions with the Area Executive, local clinicians, health service managers and community health managers.

Allied health services

Current numbers of full-time equivalent (FTE) allied health positions for each community were identified. This did not include in-patient services or staff attached to specific programs. The current average provider to standardised population ratio was determined for each discipline and applied uniformly across all service levels for the purpose of equitable distribution of the existing staff establishment.
Table 5 Ratios for the equitable distribution of allied health services

<table>
<thead>
<tr>
<th>Service</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social work</td>
<td>1 full-time equivalent per 14300 standardised population</td>
</tr>
<tr>
<td>Dietetics</td>
<td>1 full-time equivalent per 19500 standardised population</td>
</tr>
<tr>
<td>Speech pathology</td>
<td>1 full-time equivalent per 14800 standardised population</td>
</tr>
<tr>
<td>Psychology</td>
<td>1 full-time equivalent per 18500 standardised population</td>
</tr>
<tr>
<td>Occupational therapy</td>
<td>1 full-time equivalent per 11500 standardised population</td>
</tr>
</tbody>
</table>

The ratios in table 5 apply to staffing levels for community based and ambulatory services only. Following extensive discussions, it was agreed not to include physiotherapy services, due to their difficulty in accessing activity data on inpatient and ambulatory services. Once again it must be emphasised that these ratios are based on existing staff establishments. They are not recommendations for required staffing levels.

**FUTURE DIRECTIONS**

The outcomes of the service mapping process should be seen as a starting point for improved distribution of community health services within the MWAHS. It provides an opportunity to “rethink” traditional rural primary health care models to ensure that they meet current and future service demands in a consistent, planned and innovative way.

This model will be used as a framework for local health planning as well as for modelling, costing and benchmarking services. The role delineation of services and formalisation of networks proposed in the model will provide a framework to allow practice boundaries for clinicians working in different settings to be established. The framework will also allow for the provision of planned and sustainable professional and clinical support for primary care clinicians, particularly those vulnerable to isolation in level and 2 services.

It is acknowledged that the model will continue to develop and be refined. Currently, community health information systems are being introduced in centres throughout MWAHS. This will allow community health activity to be better monitored and will assist in the evaluation of the adequacy of resource distribution. Ongoing evaluation and refinement of this model will allow service planning to be responsive to the needs of individual communities and promote the appropriate investment of resources into community health services.
REFERENCES


4. MWAHS, 1999, Review of Community Based Health Services, Community Development and Primary Care Unit.


6. MWAHS, 1999, Our People, Public Health Unit, Bathurst.


PRESENTER

Anne Lea is a Registered Nurse with 22 years’ experience in acute and critical care nursing (emergency, coronary care, intensive care). Anne has a Bachelor of Health Science (Nursing) from Charles Sturt University, Mitchell and a Master of Health Service Management from the University of New England.

From 1990 to 2000 Ane was employed as a Clinical Nurse Consultant in Critical Care for the Mid Western Area Health Service. Currently she is employed as the Manager of Clinical Service Development.