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Aged care provision in Greater Bendigo: current provision and future requirements

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ABSTRACT: In the following paper, ratios which correlate aged care places with physical infrastructure requirements are developed for the regional Victorian Local Government Area of Greater Bendigo, by analysing its existing aged care facilities. These ratios are then used in conjunction with the federal government's population based measures to model scenarios of future aged care infrastructure requirements for Greater Bendigo. Strategies for the provision of additional residential aged care facilities are explored using a matrix governed by size and configuration. Variations in these two aspects are shown to affect the location options for future facilities in Greater Bendigo.

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INTRODUCTION

The Australian federal government’s Department of Health and Ageing use the ratio: places per 1000 persons aged 70 and over, to measure the provision of aged care in an area. The places included within this ratio fall into different categories of care. Aged care categories can be differentiated by the level of care provided and the type of space in which care is provided. The two main levels of aged care are high level care and low level care. Each of these main levels contain four sub-levels of care (Australian Institute of Health and Welfare 2003). The two types of space in which the different levels of care can be provided are domestic space (at-home based care) and non-domestic space (facility based care). Facility based high and low level aged care is known as Residential Aged Care. High level at-home based aged care is referred to as Extended Aged Care at Home (EACH) and low level at-home based aged care is known as a Community Aged Care Package (CACP).

The federal government uses a benchmark ratio to govern the overall provision of federally funded aged care. This benchmark was recently increased from 100 to 108 places per 1000 persons aged 70 and over (Australian Federal Government 2004). Although the benchmark remained constant at 100 places per 1000 persons aged 70 and over since the early 1980s, the actual amount and type of aged care provided during this time changed considerably (Gibson, D., Liu, Z. and Chol, C. 1993, Gibson, D. and Liu, Z. 1994). Much of this change came as a result of the introduction of at-home care. The proportion of places allocated to at-home care within the benchmark has been steadily increasing. As a consequence, the proportion of facility based places has been steadily decreasing. This trend is shown for the period between 1995 and 2002 in Figure 1.

In regional Victoria in 2002, there were 94 aged care places per thousand persons aged 70 and over (Australian Institute of Health and Welfare 2003). Of these places, 78.7 were facility based residential aged care places: 47.8 high level and 30.9 low level. The remaining 15.3 places of the 94 per thousand persons aged 70 and over were at-home based aged care packages: 13.1 CACPs and 2.2 EACH. The federal government’s measures of provision do not include EACH packages (presumably because of the limited number of areas into which they have currently been introduced), however, EACH packages are included in the measurements in this paper. (Department of Health and Ageing 2004). In Figure 2, Greater Bendigo can be seen to have had a higher level of provision than the average for regional Victoria in 2002, for all types of aged care except for high level residential aged care. Its overall level of provision of 127 places per thousand persons aged 70 and over was much higher than the overall average for regional Victoria, and it was also much higher than the federal government’s benchmark of 100 places per thousand persons aged 70 and over.

Figure 1: The number of aged care places in Australia by type, and their level of provision measured per 1,000 persons aged 70 years and over, (1995-2002).

Source: (Australian Institute of Health and Welfare 2003)

Figure 2: Aged care provision in Greater Bendigo in 2002, measured in relation to the average for regional Victoria.

Source: (Department of Health and Ageing 2004)
1. MEASURING EXISTING RESIDENTIAL AGED CARE INFRASTRUCTURE

While the government's population based ratios and benchmarks indicate the number of aged care places required to meet the needs of a given aged population, they do not give an indication of the amount of physical infrastructure required to accommodate these places. The Review of Pricing Arrangements in Residential Aged Care produced by W.P. Hogan in 2004 states that there is no mandatory gross floor area (indoor area) per resident in the Australian Government certification requirements (Hogan, W.P. 2004:140) for residential aged care facilities. For the calculations in the Hogan Review, an average indoor area of 45 square metres per residential aged care place was used. This was derived after an analysis of existing residential aged care facilities indicated that 'a gross floor area per resident of between 40 and 50 square metres is typical' (Hogan, W.P. 2004:140). An average site area of 90 square metres per place was subsequently estimated yielding a plot ratio of 2 square metres of site area per 1 square metre of indoor area. In this paper we have measured indoor areas, outdoor areas and site areas for the facilities currently providing low, high, and both high and low level residential aged care in Greater Bendigo. Using these measurements, ratios of indoor area per place, indoor area-to-outdoor area, and site area per place, have been produced for each type of facility. The current provision levels in Greater Bendigo indicated by these ratios will be used as benchmarks to estimate future infrastructure requirements given forecast population change.

Greater Bendigo's existing residential aged care facilities and the (absolute) number of places they provide are illustrated in Figure 3, and have been grouped according to the type of care they provide. The indoor area, outdoor area and site area of each facility is also shown. These figures were used to calculate, for each facility, the amount of indoor area per place, the ratio of indoor area-to-outdoor area and the amount of site area per place. For example, the Barkly Private Nursing Home has 20 high level care places. With a total of 700 square metres of indoor area, it has 35 square metres of indoor area per place. It also has 700 square metres of outdoor area, which is an indoor area-to-outdoor area ratio of 1:1. With a site area of 7,000 square metres, the Barkly Private Nursing Home has 70 square metres of site area per place, for each of its 20 places. Ratio averages have been calculated for the facilities of each type in Greater Bendigo. These are shown at the bottom of each column in Figure 3. For example, for the residential aged care facilities providing high level care in Greater Bendigo (of which the Barkly Private Nursing Home is one) there is on average 43 square metres of indoor area per place. The overall average of 50 square metre of indoor area per place found for all types of residential aged care facilities in Greater Bendigo is very close to the average of 45 square metre of indoor area per place that was found in the Hogan Review. The average indoor-to-outdoor area ratio of 1:1, and the average of 90 square metres of site area per place that were found in the Hogan Review, differ significantly from the equivalent averages found for Greater Bendigo. While these land-related differences may have resulted from the greater availability of land and lower building density historically typical of a region such as Greater Bendigo, they nonetheless appear to indicate that Greater Bendigo has a greater level of existing infrastructure (land) than what may be taken as the average from the Hogan Review.

The indoor area-to-outdoor area and the amount of site area per place found for Greater Bendigo could therefore be taken as benchmarks to be maintained, or they could be taken as indicators of the potential for expanding the indoor area of a number of facilities within their existing sites.

2. MODELLING FUTURE INFRASTRUCTURE REQUIREMENTS

To model the future residential aged care infrastructure requirements of Greater Bendigo, the possibility that the level of residential aged care provided per aged care type might change in the future from the existing provision levels (represented by the ratios) must be taken into account. As shown earlier in Figure 1, there has been a distinct national trend of such change, as at-home based aged care places have increasingly replaced facility based aged care places. A continuation of this trend would significantly alter the amount of infrastructure required for residential aged care facilities by 2021, due to the ‘at-home’ based nature of CACPs and EACH packages. Possible changes to the type of aged care provided in future can be explored through scenario modelling. Three possible scenarios of future change to aged care provision have been developed: from the trends shown in Figure 1, current government policy, and from government statements on future aged care provision. These scenarios are described in Figure 4.

![Figure 3: Greater Bendigo's residential aged care facilities: their size by place and area and their ratios.](image)

![Figure 4: Possible scenarios of change to the provision of aged care.](image)
measured per thousand persons aged 70 and over. The figures in scenario A indicate that to maintain the current level of provision relative to the population aged 70 and over, the actual number of places must increase significantly. As the allocation of care is varied in scenarios B and C, the number of places in each aged care type either increases (at-home based care) or decreases (facility based care) relative to scenario A.

<table>
<thead>
<tr>
<th>Care Type</th>
<th>Aged Care Places (shown in brackets) and Places per 1000 Persons Aged 70 and Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Level Res.</td>
<td>43 (375)</td>
</tr>
<tr>
<td>Low Level Res.</td>
<td>52.5 (458)</td>
</tr>
<tr>
<td>CACP</td>
<td>27.6 (241)</td>
</tr>
<tr>
<td>EACH</td>
<td>3.9 (34)</td>
</tr>
<tr>
<td>Total</td>
<td>127 (1,108)</td>
</tr>
</tbody>
</table>

**Figure 5:** The number of aged care places required in Greater Bendigo by 2021 under scenarios A, B, and C.

Figure 6 represents in graphical form the changes that would occur to aged care provision in Greater Bendigo between 2004 and 2021 under scenarios A, B, and C. In Figure 6, the absolute numbers of aged care places (that were shown in brackets in Figure 5) are represented by the columns. The number of aged care places measured per thousand persons aged 70 and over are represented by the lines.

It can be seen in Figure 6 that the increase in the proportion of EACH packages under scenarios B and C reduces the number of additional high level residential aged care places needed by 2021 from what currently exists. Furthermore, the increased proportion of CACPs under scenario C results in fewer low level residential aged care places. Such scenarios would equate to significant reductions in new infrastructure requirements; but whether at-home care would adequately meet the needs of such a large proportion of the aged in need of care would require further investigation.

**Figure 6:** The number of aged care places required in Greater Bendigo by 2021 under scenarios A, B, and C.

**Figure 7:** The amount of additional infrastructure required in Greater Bendigo by 2021 under scenarios A, B, and C.

Figure 7 shows the additional residential aged care places required in Greater Bendigo by 2021 under scenarios A, B, and C, (resulting from the additional number of persons forecast to be aged 70 and over in 2021). Population forecasts produced by the Victorian Department of Sustainability and Environment (DSE) were used for Greater Bendigo and Warrnambool. The amount of indoor area, outdoor area and site area required to accommodate the scenarios (with respect to the existing infrastructure provision ratio averages that were calculated in Figure 3) are also shown.

**3. THE CONFIGURATION AND LOCATION OF ADDITIONAL INFRASTRUCTURE**

The additional aged care places, indoor area, outdoor area and site area that are required under scenarios A, B and C may be physically configured in a number of ways. Their configuration both affects and is affected by the location options (available sites) within an area. As was mentioned earlier, the large average amount of site area per place for the facilities in Greater Bendigo (relative to average in the Hogan Review) appears to indicate the possibility that some of the additional infrastructure required may be accommodated within existing residential aged care sites. While this is a possibility, to do so would reduce the average amount of site area per place, which in effect would represent a reduction in the current level of outdoor area provision. This section of the paper will explore the configuration and location of additional infrastructure with respect to locating new facilities on new sites using the existing ratios, thereby maintaining the relative level of provision.

**3.1. Configuration options**

If we consider the number of places contained within each new facility, then the additional residential aged care places required in Greater Bendigo under the three scenarios shown in Figure 7 can be approximated to 600 under scenario A, 300 under scenario B and 150 under scenario C. Approximating the additional number of residential aged care places in this way allows the configuration of: number of places; indoor area; outdoor area; and site area to be systematically explored for each of the scenarios.

**Figure 8:** Configuration options for Greater Bendigo's required residential aged care infrastructure.

Progressively dividing the number of facilities yields a

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range of facility sizes (see Figure 8). The size of a facility can be viewed from the perspective of the number of places it contains, its indoor area, its outdoor area, or its site area. The number of new facilities into which the additional aged care requirements can be divided is dependent on the size of the facility. For example, under scenario A, if there is a desire for facilities that are 150 places in size, then four new facilities will be required to accommodate the 600 additional aged care places. Under scenario B, only 300 additional aged care places are required. These can be accommodated by two new facilities 150 places in size. Under scenario C, 150 additional aged care places are required. Only one new facility 150 places in size would be required to accommodate these additional places. The ratio of 90 square metres of site area per aged care place derived from the Hogan Review is approximately half of the equivalent ratio found for Greater Bendigo, (208 square metres of site area per aged care place). Figure 8 can be viewed from the perspective of the 90 square metres of site area per aged care place ratio by moving all of the figures listed under ‘site area’ up one row. For example, a facility containing 600 places would require a site area approximately 65,000 square metres in size, rather than a site area 130,000 square metres in size.

3.2 Location Options
Location options are dependent upon the availability of land. Location options for Greater Bendigo’s additional residential aged care facilities are explored using sites as an indicator of physical infrastructure requirements. Figure 9 shows the locations of Greater Bendigo’s existing residential aged care facilities in relation to the city centre and the developed areas. Most of the existing facilities are located within a 5 kilometre radius of the city centre, (indicated by the smallest ring in Figure 9). There is one other residential aged care facility located in Greater Bendigo that is not shown in Figure 9. This facility is located in the outlying town of Heathcote which is approximately 40km from the Bendigo city centre.

Figure 9: The location of the existing residential aged care facilities in Greater Bendigo.

Figure 10b shows the available sites remaining in Bendigo that would be large enough to serve as the site of a single facility containing all 600 of the new residential aged care places estimated to be required by2021. Adjoining sites have been combined in Figure 10b-f. As can be seen, there are few sites of this size within a 5 kilometre radius of the city centre. Most of the sites of this magnitude are located between 5 and 15 kilometres from the centre of the city, on the outer fringes of the developed area. The available sites shown in Figures 10c-f reduce in size in line with the site areas illustrated in Figure 8. As the minimum site area is reduced the number of sites can be seen to increase, particularly those located within 5 kilometres of the city centre.

4. CONCLUSION
The federal government has for many years monitored change in the population aged 70 and over, in order to indicate and anticipate the changes required in the number of aged care places. The ratio of ‘places per thousand persons aged 70 and over’ that the federal government adopted to achieve this can also be used in conjunction with population forecasts to estimate future aged care requirements. However, while the size of future aged populations and the number of aged care places required can be estimated using this ratio, a method does not exist with which to determine the amount of physical aged care infrastructure required to accommodate future place numbers. Physically locating additional aged care places within an area requires consideration of aged care facilities: their number, indoor area, outdoor area, site area and location.

The survey of the existing residential aged care facilities in Greater Bendigo has enabled the current amounts of physical aged care infrastructure to be established. This has allowed correlations to be developed between physical aged care infrastructure, aged care places, and aged populations. By changing one of the figures with respect to indoor area per place, indoor area-to-outdoor area, or site area per place, subsequent changes required to re-establish and maintain the original ratio can be modelled. As such, these ratios allow organisations such as local councils and aged care providers to consider and plan how future aged care needs might be met through the exploration of different siting options. The amount of aged care, the type of aged care, the size of facilities, the configuration of facilities (both in terms of the number of sites and the size of the sites required), and the location of facilities (with consideration of the physical context), can all potentially act as drivers in scenario modelling.

It has been demonstrated in this paper that Greater Bendigo’s current supply of undeveloped and underdeveloped sites is limited, (with certain sized sites in more limited supply in some locations than in others). If sites located close to the city centre (such as those of the existing residential aged care facilities in Greater Bendigo) are desired for new residential aged care facilities, strategies which seek to overcome site limitations may need to be explored. Such strategies may include configuring facilities in ways that require smaller site areas, reducing the current amount of outdoor area, or re-using ‘brownfield’ sites. The ratios, methods of scenario modelling and methods of exploring the configuration and location of facilities discussed in this paper are potential tools and methods for developing such strategies.
5. REFERENCES


