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The geography of disability and economic disadvantage in Australian capital cities

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Summary

This report presents data from the 2006 Census on severe disability among Australians aged 0–64 years living in capital cities. It also uses the Australian Bureau of Statistics' (ABS) Index of Economic Resources to rank local areas within the cities according to the relative socioeconomic status of their residents.

How common is severe disability in our capital cities?

- The proportion of people with severe disability ranged from 1.9% in Perth, Darwin and Canberra to 2.8% in Hobart.
- This means that people living in Hobart were about 50% more likely to have severe disability than those living in Perth, Darwin or Canberra.

Greater disadvantage, more disability

- Severe disability was more common in areas whose residents had relatively few economic resources than areas whose residents had more. This is referred to as 'the social gradient of disability'.
- 3.1% of people living in the most disadvantaged fifth of local areas within Australian capital cities had severe disability, compared to 1.3% in the most advantaged fifth

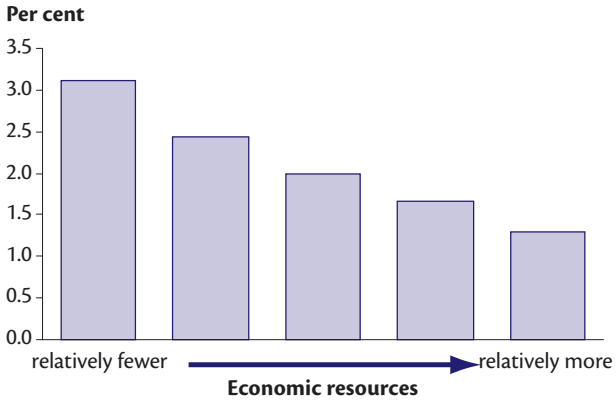

Figure 1: Percentage of people aged 0–64 years living in capital cities with severe disability, by quintile of disadvantage of area of usual residence, 2006

Disadvantage causes disability, or vice versa, or both?

- The relationship between economic disadvantage and disability may be due to a combination of different factors. For example:
  - on average, people with disability, and their carers, have lower income than people without disability
  - disability can impose extra costs on individuals and their families
  - a high proportion of public housing tenants have disability, and public housing in some cities is concentrated in disadvantaged areas
  - many risk factors for chronic disease and disability are higher among disadvantaged people
  - people working in lower status jobs can face greater occupational hazards that contribute to disability
  - physical and pyschosocial hazards can be higher in more disadvantaged communities.

Introduction

Socioeconomic status is negatively associated with various health outcomes. Broadly speaking, relatively disadvantaged members of society tend to have worse health than those who are relatively advantaged, even in wealthy countries. This phenomenon is known as the social gradient of health.

The social gradient of health in Australia is well established. Compared to people living in areas of relatively low socioeconomic disadvantage, people living in highly disadvantaged areas have higher death rates and reduced life expectancy at all ages (Draper et al. 2004). Socioeconomic disadvantage is also associated with higher reported rates of a number of chronic health conditions including diabetes, mental and behavioural problems, and diseases of the circulatory, digestive and musculoskeletal systems (Glover et al. 2004).

International research has also shown that there is a relationship between socioeconomic status and disability (for example, see Rognerud et al. 1998; Schoeni et al. 2005; Minkler et al. 2006). This report examines the social gradient of disability in Australia, focusing on people living in the eight state and territory capital cities.

Much disability research in Australia is underpinned by the ABS Survey of Disability, Ageing and Carers (SDAC), which defines disability as having one or more of a wide range of impairments, activity limitations or participation restrictions that are long-term and restrict everyday activities. The SDAC shows that disability is more common in regional and remote areas than in major cities (AIHW 2008a) and in areas of relatively high socioeconomic disadvantage than in less disadvantaged areas (Bradbury et al. 2001). However, the SDAC is not suitable for detailed geographical breakdown of its estimates or analysis of small populations, so variations in the distribution of disability among small regions cannot be discerned.

This report draws on the 2006 Census of Population and Housing, the first Australian Census to include a measure of disability in its output. The focus here is on capital cities for several reasons:

- they have relatively large populations, enabling them to be broken down into smaller areas without losing data quality
- SLAs within capital cities generally occupy small geographical areas, meaning that differences between SLAs are less likely to be influenced by factors relating to distance than in regional or remote areas
- they have diverse populations: in particular, there are considerable differences in the access to economic resources enjoyed by people living in the least and most disadvantaged areas.

The analysis presented here is limited to people aged less than 65 years. This age group is the primary target for government-funded specialist disability services, and excludes many people whose disability is related to ageing.

About the data

This report, presenting analysis of the ABS 2006 Census of Population and Housing, refers to the following Census-based topics:

Severe disability

The Census identified people who reported a need for assistance with at least one of the core activities of daily living—mobility, self-care and communication. The Census topic *core activity need for assistance* is conceptually similar to the item *profound or severe core activity limitation* reported in the SDAC and other disability collections. It is regarded as an approximation of the most severe end of the disability spectrum. For simplicity, *core activity need for assistance* is referred to as *severe disability* throughout this bulletin.

This bulletin compares severe disability rates between local areas; it does not attempt to provide precise estimates of the number of people with disability or those who may need disability services. Because the *core activity need for assistance* topic in the Census is based on a small number of self-reported items, prevalence estimates will be less accurate than those derived from the SDAC. However, the Census data are highly suitable for comparing areas.

Disability rates are related to both age and sex (AIHW 2005: Figure 5.3). All else being equal, a population with a high proportion of older people would have more people with disability than a population with a younger age structure. The Census data for each area have been standardised to account for the effect of the age and sex distribution within each area, so that differences between areas reflect differences in the 'underlying rate' of severe disability.

Not all people who completed the 2006 Census answered the questions relating to disability. To ensure consistency between areas, individuals who did not respond were excluded from the calculations of disability rates.

Statistical Local Area (SLA)

SLAs are one of the smallest units of the Australian Standard Geographical Classification (ABS 2006), generally based on the administrative areas of local governments. SLAs cover the whole of Australia without gaps or overlap. Because of their relationship to local government areas, the number of SLAs in a city and the average number of people in an SLA differs from state to state.

Some SLAs are also whole Local Government Areas (LGAs). These SLAs adopt the LGA name followed by a suffix indicating the LGA status: City (C), Area (A), Shire (S), Municipality (M), or Town (T). Full SLA names are shown in Appendix Table A5 (available online at <www.aihw.gov.au/publications>); however, for simplicity, the suffixes have not been included on map labels in the body of this report.

SLAs aggregate to Statistical Subdivisions, which in turn aggregate to Statistical Divisions (SDs). Each capital city comprises a single SD. SD boundaries are designed to be stable, so the capital city boundaries have been defined to contain the anticipated development of the city over the next 20 years.

Relative advantage and disadvantage

Socioeconomic disadvantage is a complex concept that incorporates people's access to resources and their ability to participate in the economic and social aspects of society. The ABS has used the 2006 Census data to develop four indexes relating to different aspects of socioeconomic conditions in geographic areas (ABS 2008a). This report uses the Index of Economic Resources to compare the relative disadvantage experienced by people living in different SLAs. This index comprises a range of variables related to the financial aspects of disadvantage, including the percentage of residents with high or low incomes, the proportion of owner-occupied dwellings, and the number of business owners. Some of the variables, such as those relating to lone-parent families and overcrowded housing, have clear social as well as financial aspects. For a full list of variables included in the Index of Economic Resources, see Table A4.

In this report, SLAs have been ranked according to their score on the Index of Economic Resources, then divided into five equal groups called 'quintiles'. The lowest ranking quintile contains SLAs with a relatively high incidence of disadvantage as well as a relatively low incidence of advantage. At the opposite end of the spectrum, the highest ranking quintile contains SLAs with relatively less disadvantage and relatively more advantage. For simplicity, these quintiles will be referred to as 'the relatively most disadvantaged' and 'the relatively most advantaged', respectively.

Two other indexes produced by the ABS, the Index of Relative Socio-Economic Disadvantage and the Index of Relative Socio-Economic Advantage and Disadvantage, provide a more general indication of the average socioeconomic status of people living in an SLA. However, as both of these indexes include the disability variable in their construction, they are not appropriate tools to determine whether disability has a social gradient.

It is important to note that the Index of Economic Resources represents the average of all people living in an area, not the individual situation of each person in the area. Therefore the association between the percentage of people with severe disability in an SLA and the relative economic resources of the SLA shown in this bulletin does not prove that all people with severe disability necessarily have access to few economic resources—although many may. In addition, the index does not take into account the environment or community resources such as public transport or services located in a local area.

A small number of SLAs have not been assigned a score on the Index of Economic Resources due to low populations or high non-response rates. These SLAs, and any other SLAs where fewer than 500 people aged 0–64 years responded to the Census disability questions, have been excluded from the analysis.

For details of the analysis methodology, refer to the Technical Notes on page 22.

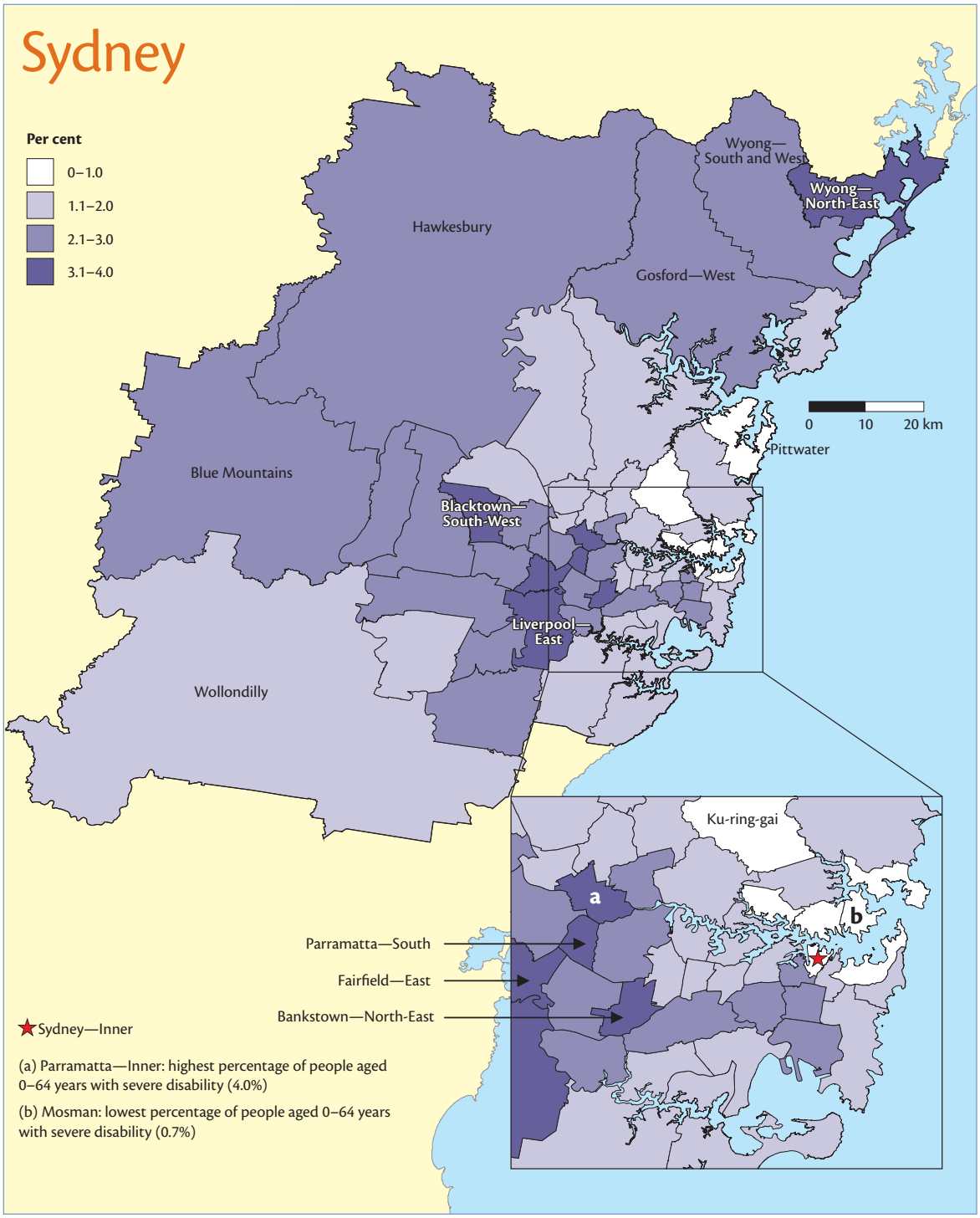

Figure 2: Percentage of Sydney residents aged 0–64 years with severe disability, by SLA of usual residence, 2006

What does the map tell us?

- 2.0% of people aged 0–64 years living in Sydney in 2006 had severe disability
  - ranging from 0.7% in Mosman to 4.0% in Inner Parramatta.
- People living in the most disadvantaged quintile of Sydney were 2.6 times as likely to have severe disability (2.9%) as people living in the most advantaged quintile (1.1%), when local areas were ranked according to their residents' average access to economic resources.
- The social gradient of disability in Sydney is strong (Spearman's rank order correlation coefficient= −0.817).

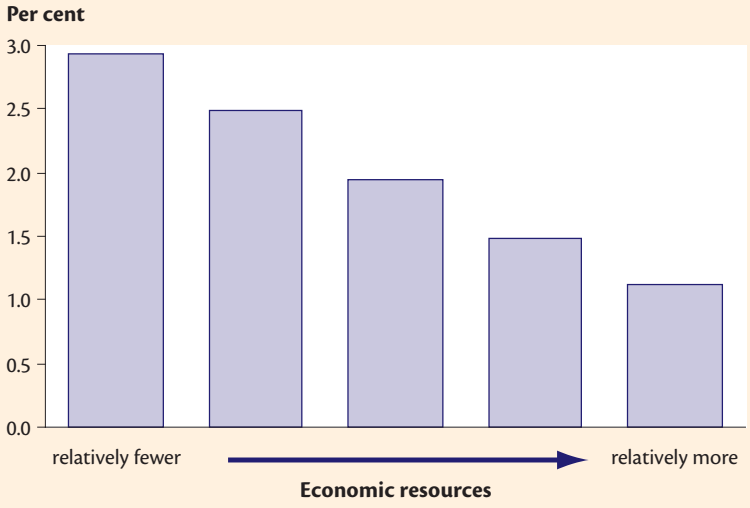

Figure 3: Percentage of Sydney residents aged 0–64 years with severe disability, by quintile of disadvantage of SLA of usual residence, 2006

Source: Table A1.

Sydney

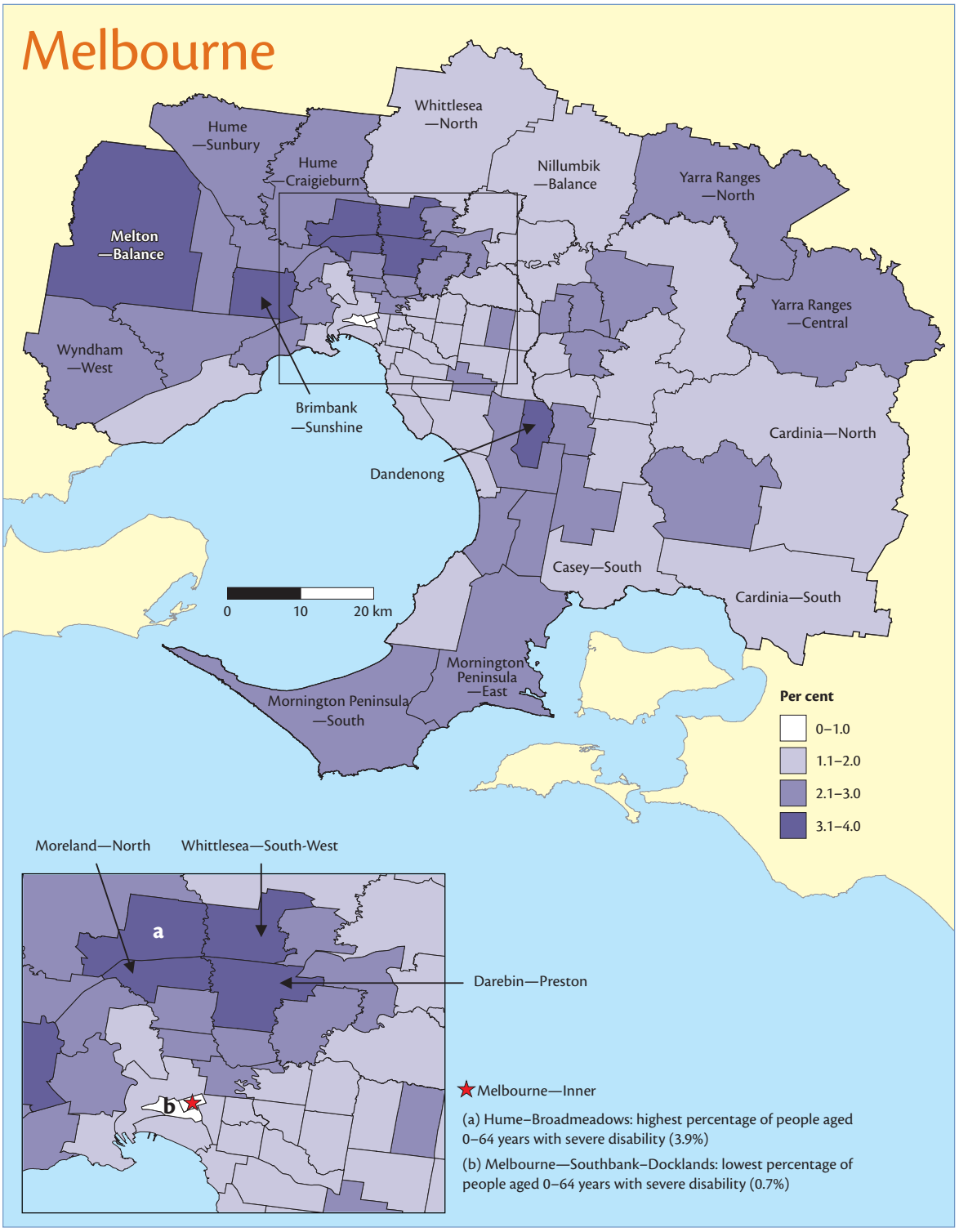

Figure 4: Percentage of Melbourne residents aged 0–64 years with severe disability, by SLA of usual residence, 2006

What does the map tell us?

- 2.1% of people aged 0–64 years living in Melbourne had severe disability
  - ranging from 0.7% in Melbourne—Southbank–Docklands to 3.9% in Hume–Broadmeadows.
- People living in the most disadvantaged quintile of Melbourne were twice as likely to have severe disability (2.8%) as those living in the most advantaged quintile (1.4%).
- The social gradient of disability in Melbourne is strong (Spearman's rank order correlation coefficient = −0.698).

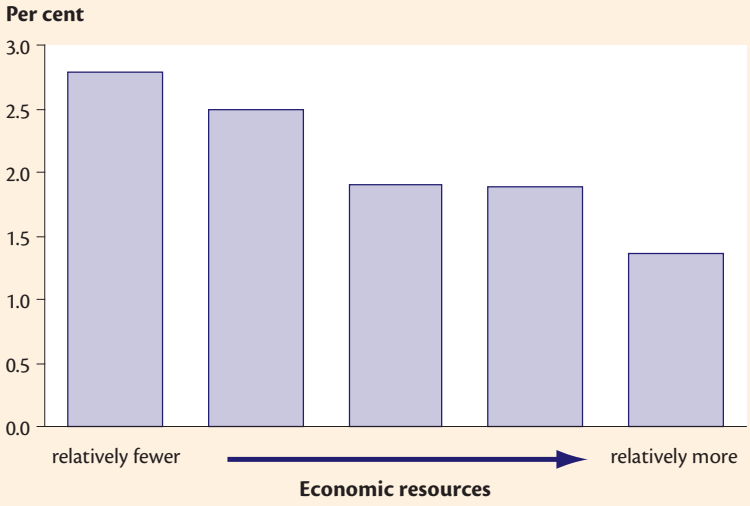

Figure 5: Percentage of Melbourne residents aged 0–64 years with severe disability, by quintile of disadvantage of SLA of usual residence, 2006

Source: Table A1.

Melbourne

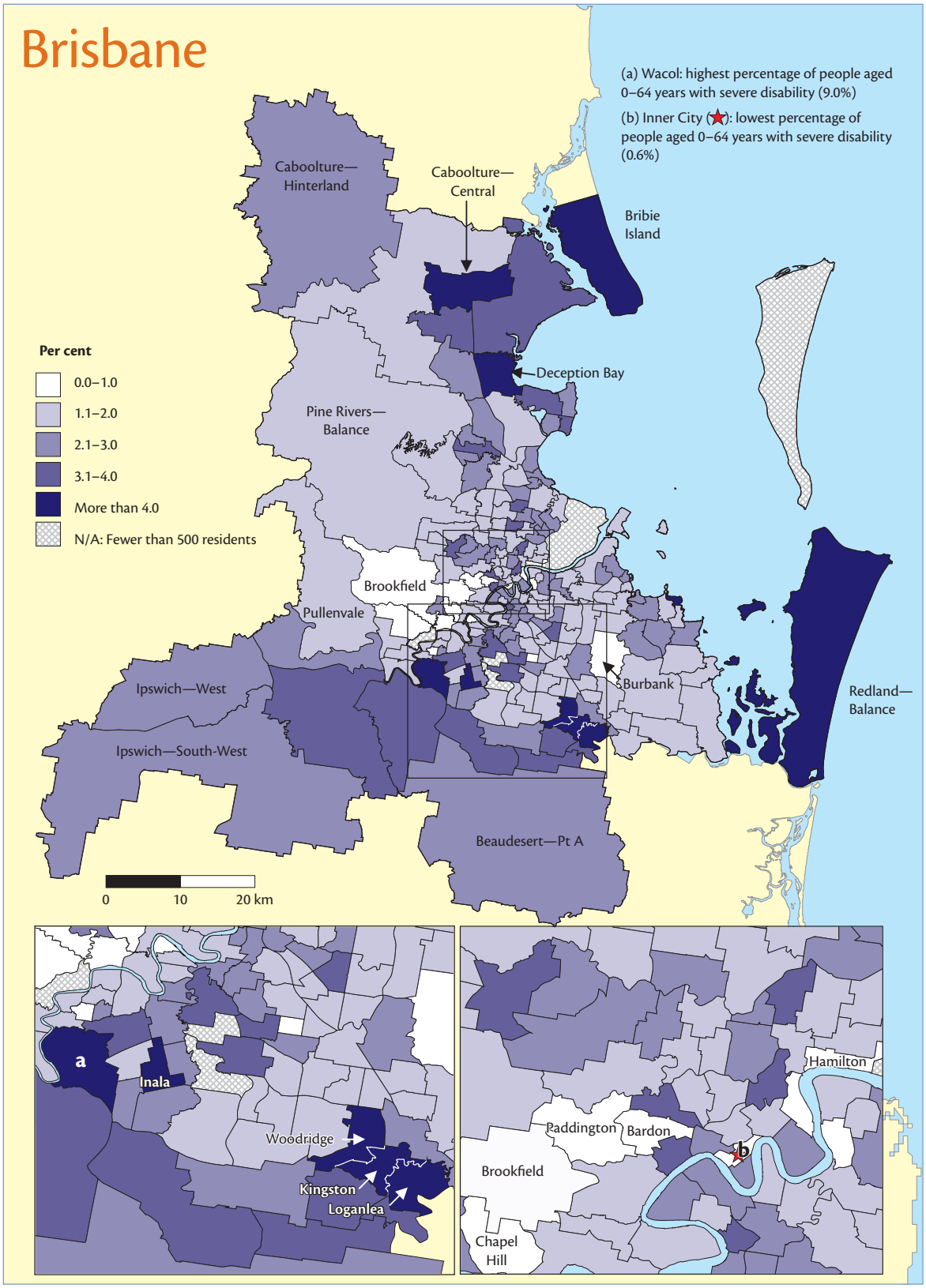

Figure 5: Percentage of Brisbane residents aged 0–64 years with severe disability, by SLA of usual residence, 2006

What does the map tell us?

- 2.3% of people living in Brisbane aged 0–64 years had severe disability
  - ranging from 0.6% in the Inner City to 9.0% in Wacol
  - people living in Wacol were almost four times as likely to have severe disability as the Brisbane average. This SLA includes a large psychiatric hospital. Excluding Wacol from the analysis has only a marginal effect on the rate of severe disability in the most disadvantaged quintile and the strength of the social gradient in Brisbane
  - after Wacol, the SLA with the second highest percentage of people with severe disability was Redland—Balance (5.8%)
- People living in the most disadvantaged quintile of Brisbane were 2.4 times as likely to have severe disability (3.5%) as those in the most advantaged quintile (1.5%).
- The social gradient of disability in Brisbane is strong (Spearman's rank order correlation coefficient = −0.749).

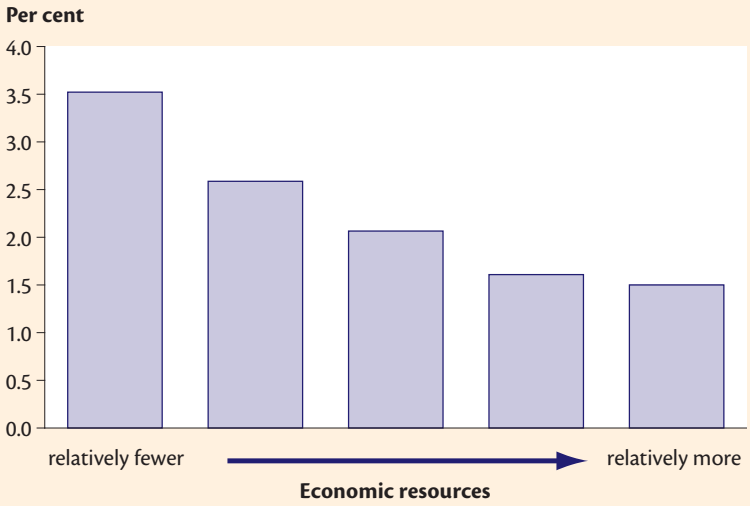

Figure 6: Percentage of Brisbane residents aged 0–64 years with severe disability, by quintile of disadvantage of SLA of usual residence, 2006

Source: Table A1.

Brisbane

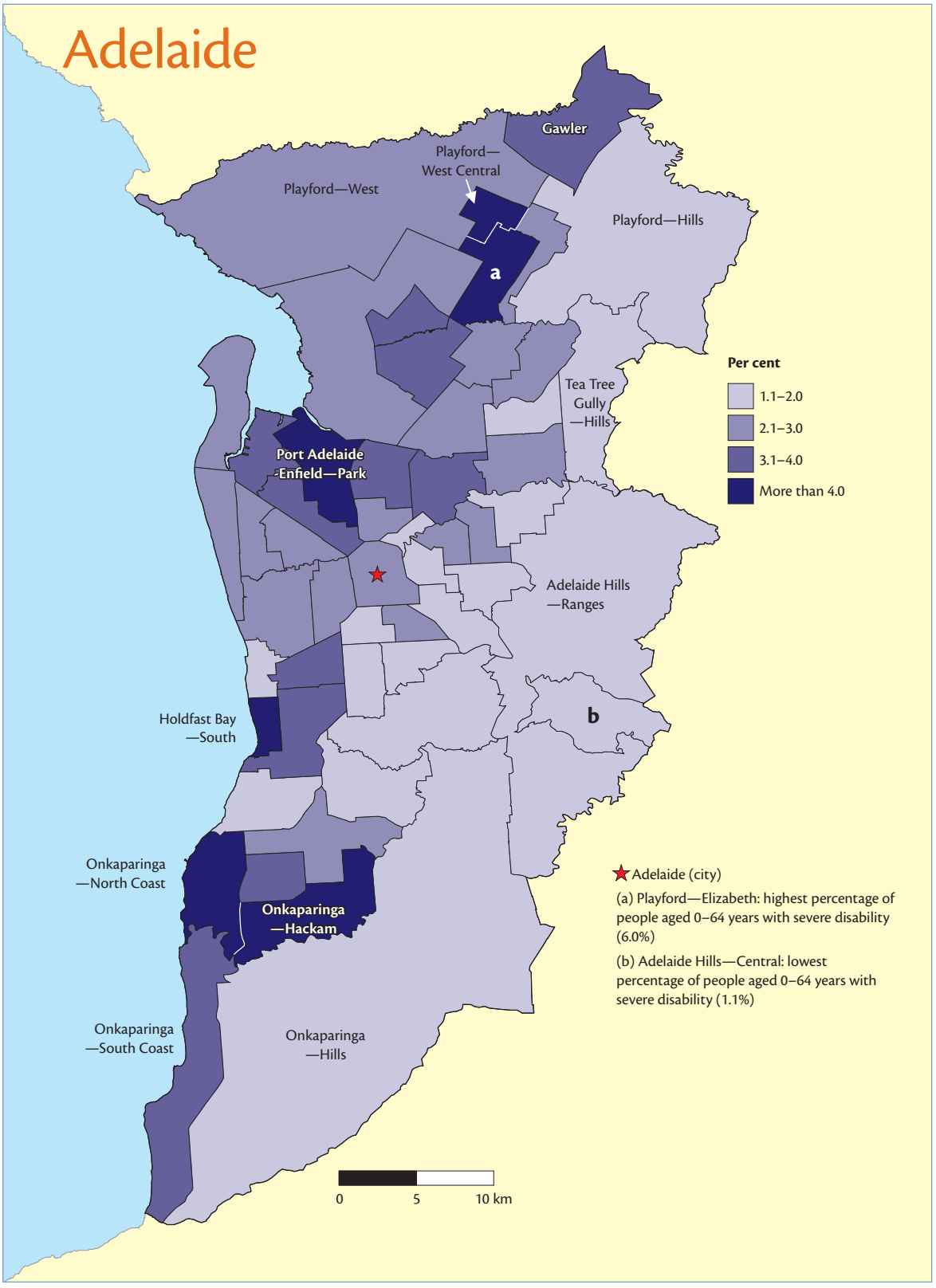

Figure 7: Percentage of Adelaide residents aged 0–64 years with severe disability, by SLA of usual residence

What does the map tell us?

- 2.7% of people aged 0–64 years living in Adelaide had severe disability
  - ranging from 1.1% in Adelaide Hills—Central to 6.0% in Playford—Elizabeth.
- People living in the most disadvantaged quintile of Adelaide were 2.6 times as likely to have severe disability (4.0%) as people living in the most advantaged quintile (1.5%).
- The social gradient of disability in Adelaide is very strong (Spearman's rank order correlation coefficient = −0.859).

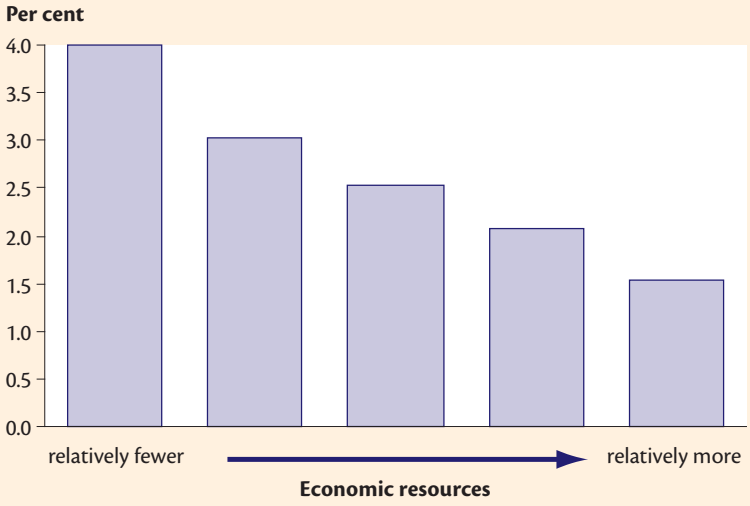

Figure 8: Percentage of Adelaide residents aged 0–64 years with severe disability, by quintile of disadvantage of SLA of usual residence, 2006

Source: Table A1.

Adelaide

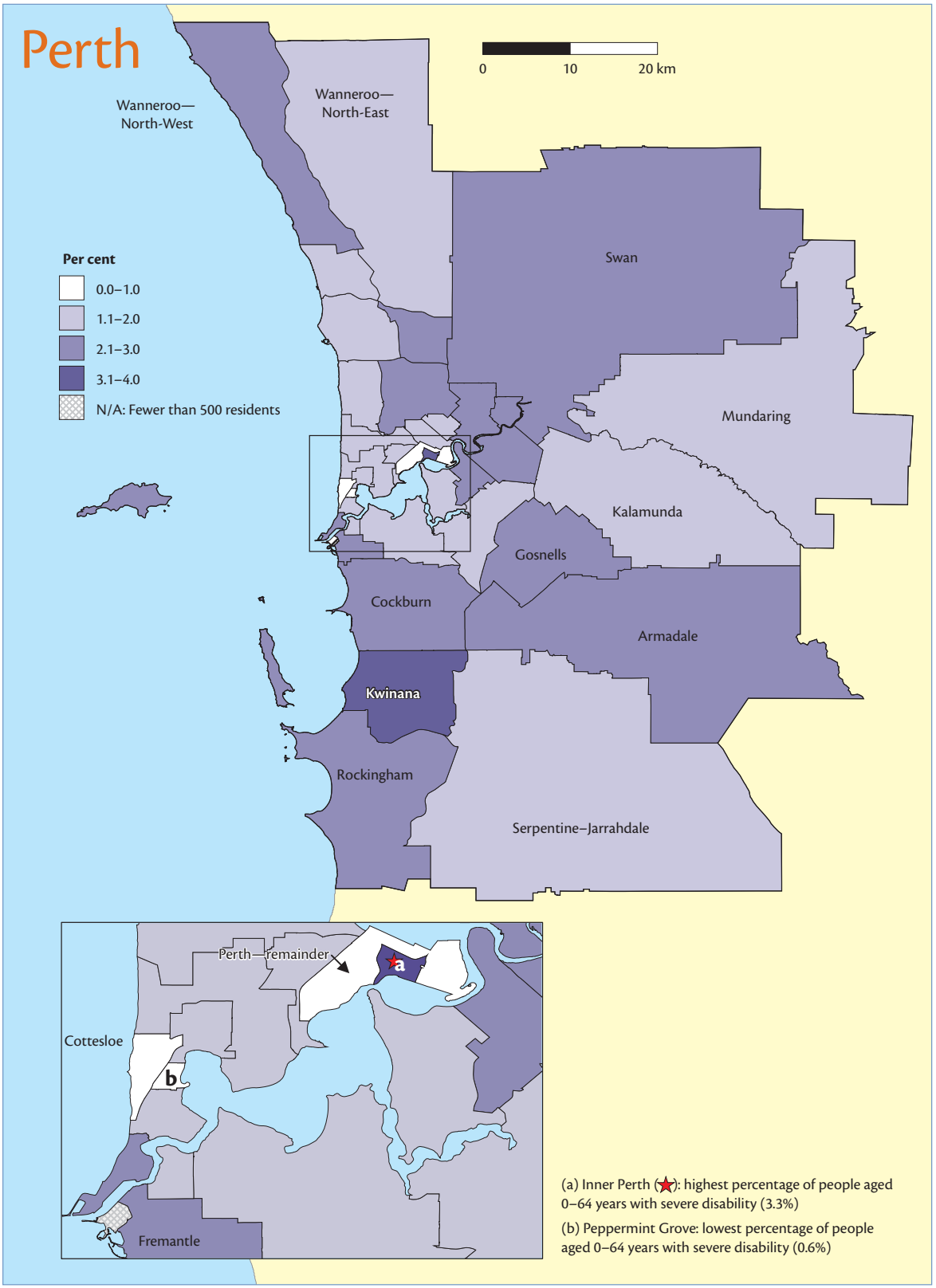

Figure 9: Percentage of Perth residents aged 0–64 years with severe disability, by SLA of usual residence

What does the map tell us?

- 1.9% of people living in Perth aged 0–64 years had severe disability
  - ranging from 0.6% in Peppermint Grove to 3.3% in Inner Perth.
- Around 1 in 3 people living in Inner Perth did not respond to the Census disability questions. The SLA with the second highest percentage of people with severe disability was Kwinana (3.1%).
- People living in the most disadvantaged quintile of Perth were almost twice as likely to have severe disability (2.5%) as those living in the most advantaged quintile (1.3%).
- The social gradient of disability in Perth is moderate (Spearman's rank order correlation coefficient = −0.678).

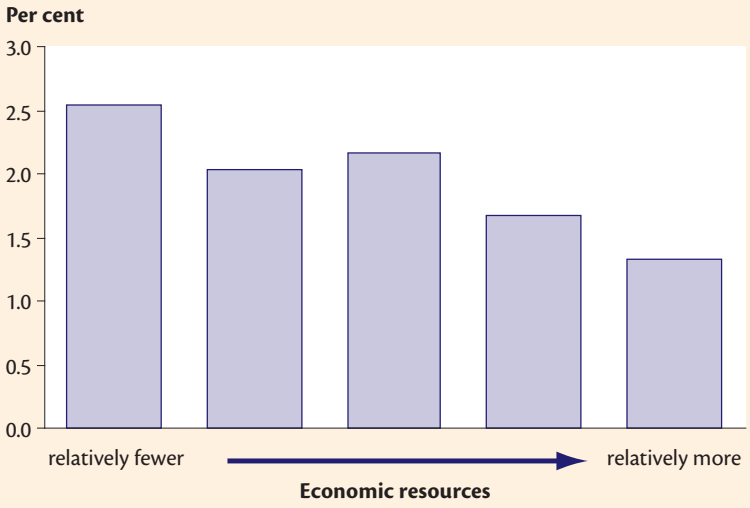

Figure 10: Percentage of Perth residents aged 0–64 years with severe disability, by quintile of disadvantage of SLA of usual residence, 2006

Source: Table A1.

Perth

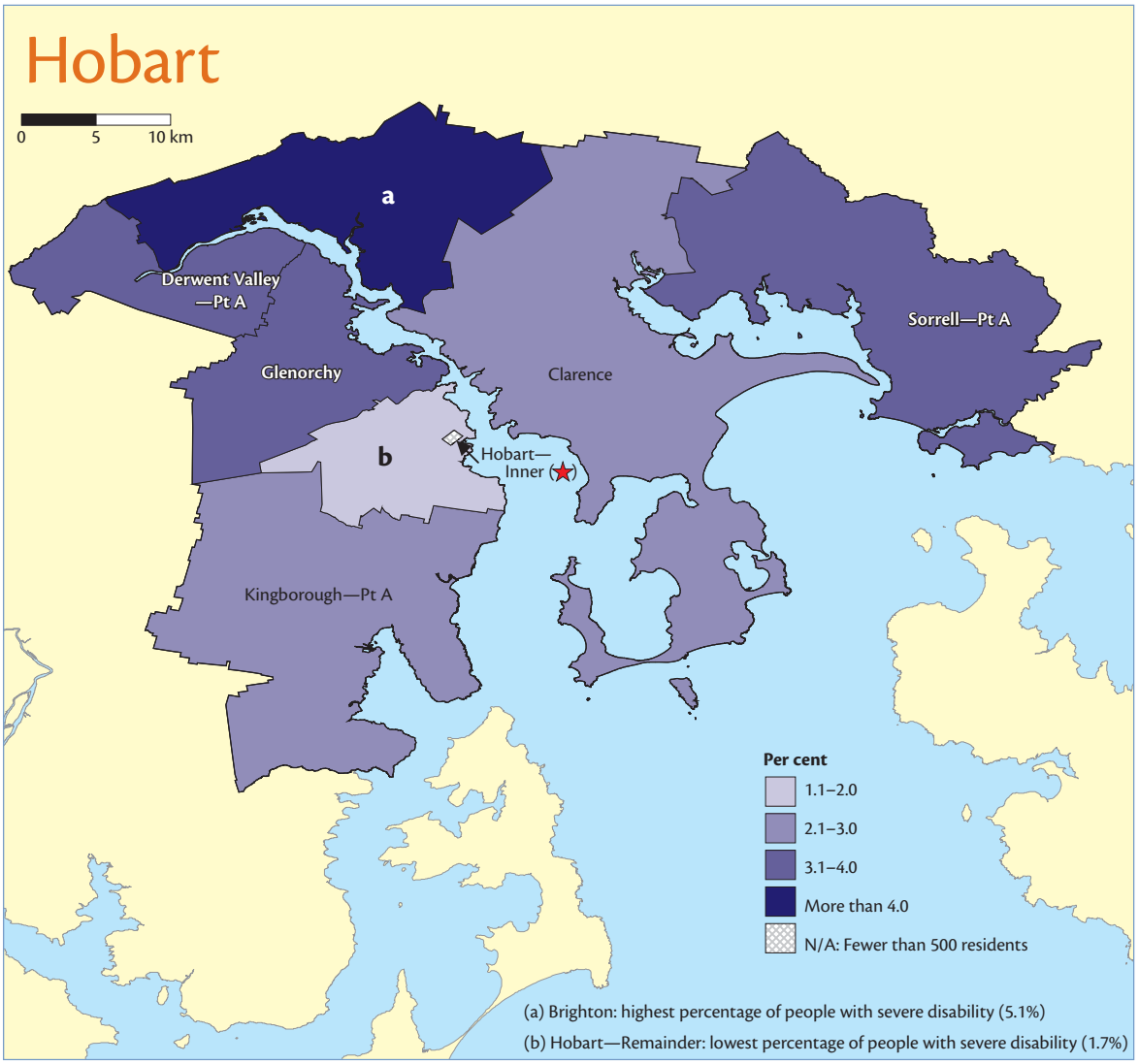

Figure 11: Percentage of Hobart residents aged 0–64 years with severe disability, by SLA of usual residence

What does the map tell us?

- 2.8% of people in Greater Hobart aged 0–64 years had severe disability
  - ranging from 1.7% in Hobart—Remainder to 5.1% in Brighton.
- Greater Hobart has only seven SLAs 500 or more residents aged 0–64 years, so it is not possible to divide these into quintiles.
- People living in the most disadvantaged SLA were more than 2.5 times as likely to have severe disability (5.1%) as those living in the most advantaged SLA (2.0%).
- The social gradient of disability in Greater Hobart is very strong (Spearman's rank order correlation coefficient = −0.929).

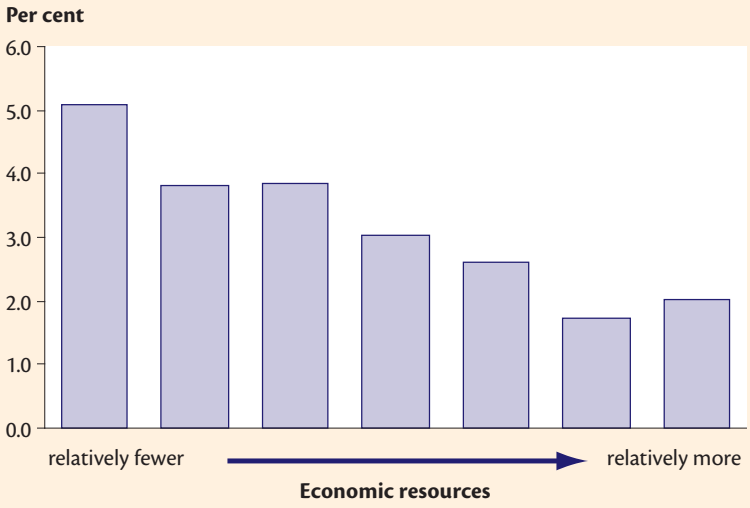

Figure 12: Percentage of Hobart residents aged 0–64 years with severe disability, by disadvantage rank of area of usual residence, 2006

Source: Table A2.

Hobart

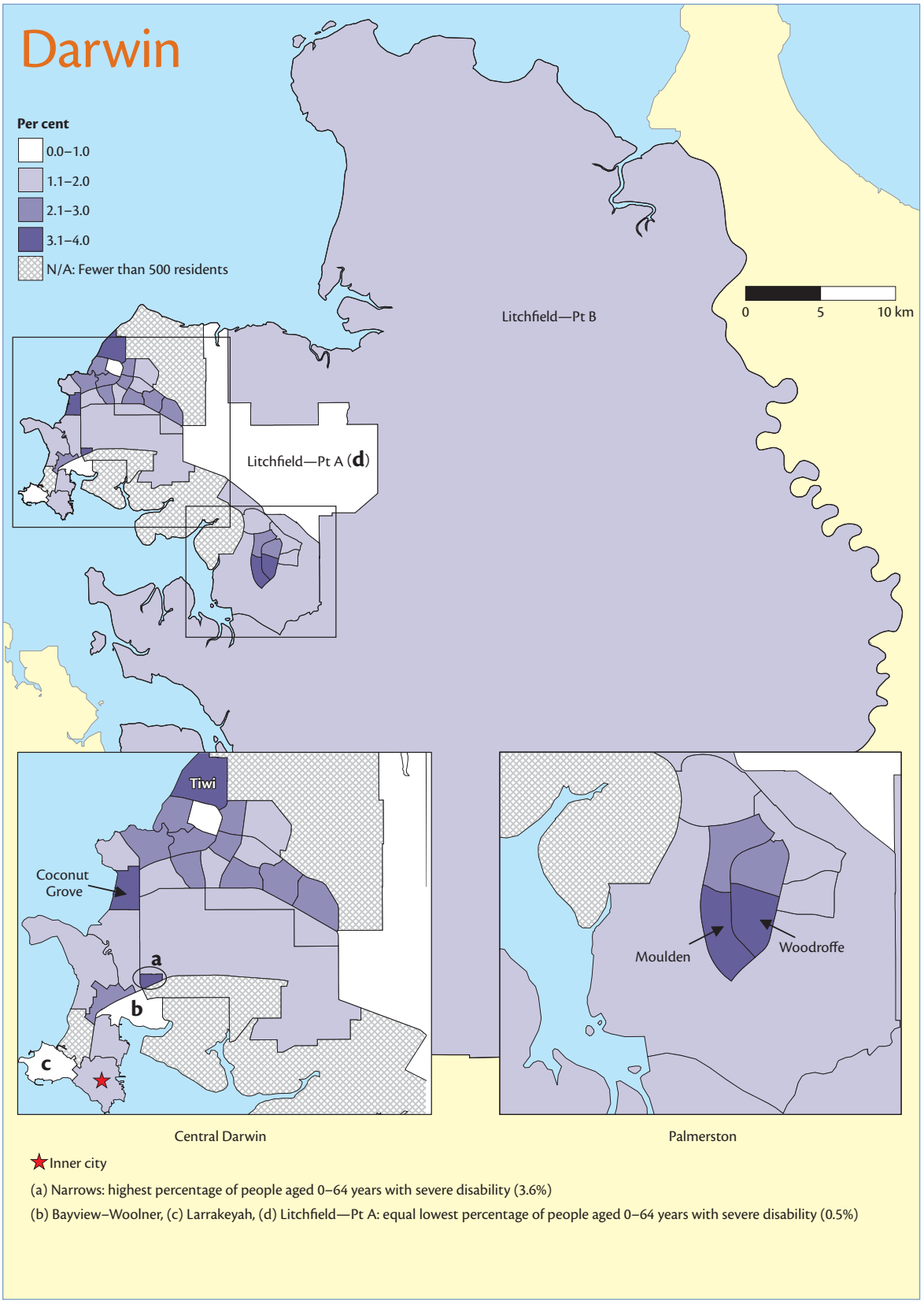

Figure 13: Percentage of Darwin residents aged 0–64 years with severe disability, by SLA of usual residence

What does the map tell us?

- 1.9% of people aged 0–64 years living in Darwin had severe disability
  - ranging from 0.5% in Bayview–Woolner, Larrakeyah and Litchfield—Pt A to 3.6% in Narrows.
- People living in the most disadvantaged quintile of Darwin were more than twice as likely (2.5%) to have severe disability as those living in the most advantaged quintile (1.2%).
- Darwin has a moderate social gradient of disability (Spearman's rank order correlation coefficient = −0.688).

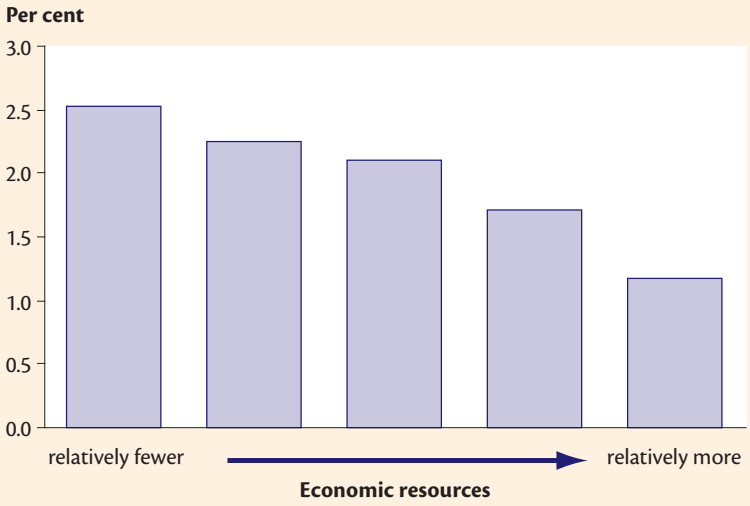

Figure 14: Percentage of Darwin residents aged 0–64 years with severe disability, by quintile of disadvantage of SLA of usual residence, 2006

Source: Table A1.

Darwin

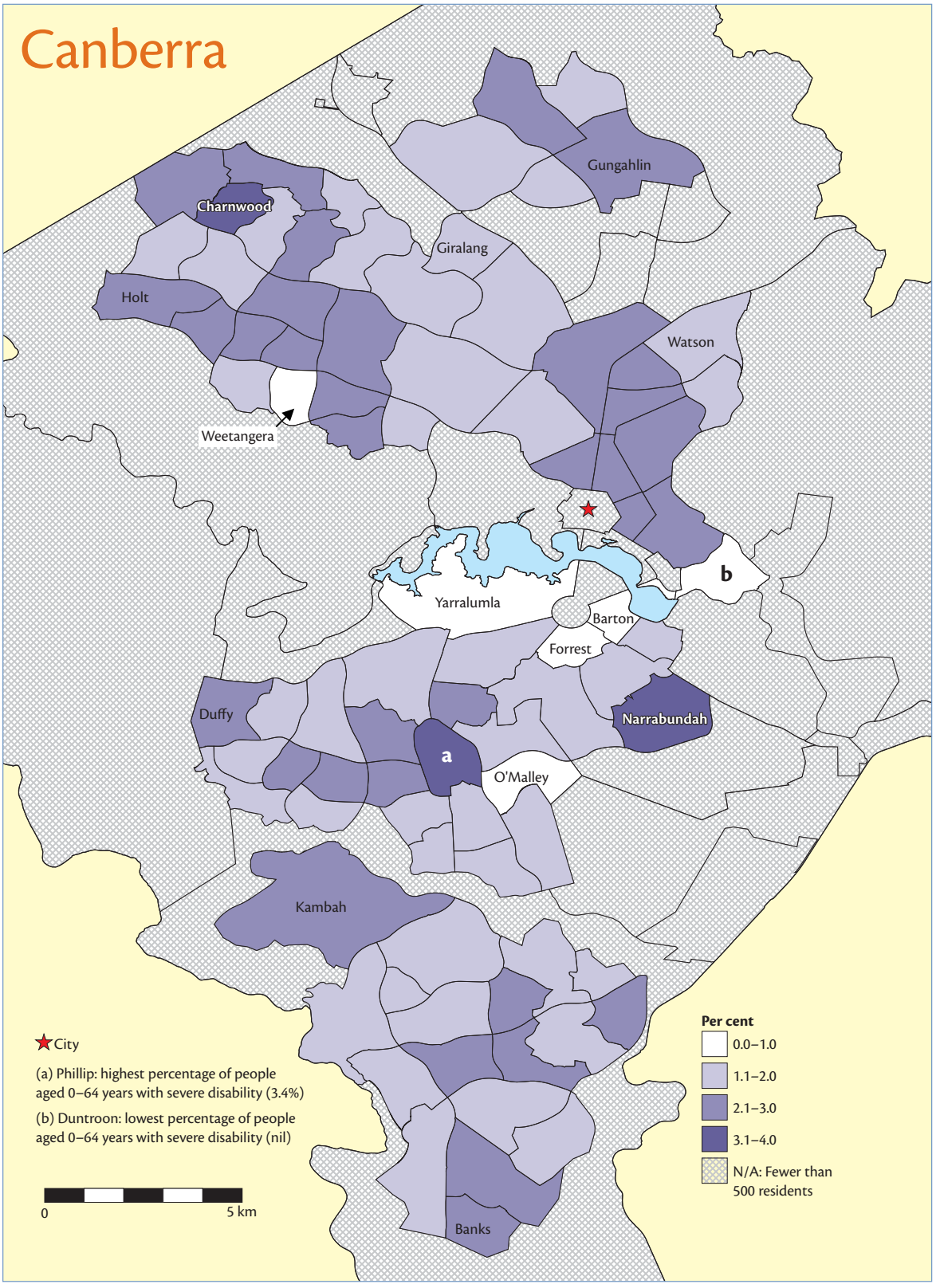

Figure 15: Percentage of Canberra residents aged 0–64 years with severe disability, by SLA of usual residence

Canberra

What does the map tell us?

- 1.9% of people aged 0–64 years living in Canberra had severe disability
  - ranging from nil in Duntroon to 3.4% in Phillip.
- Duntroon is the site of the Royal Military College, the Australian Army's officer training establishment. More than three-quarters of Duntroon residents aged 0–64 years were employed in the defence or tertiary education sectors.
- After Duntroon, the SLA with the second lowest rate of severe disability among people aged 0–64 years was Barton (0.3%).
- People living in the most disadvantaged quintile of Canberra were around 80% more likely to have severe disability (2.5%) than people living in the most advantaged quintile (1.4%).
- Canberra's social gradient is almost flat in the middle—severe disability rates vary only at either extreme of the socioeconomic spectrum. For the people living in the middle quintiles, there is very little difference in disability rates between SLAs.
- The social gradient of disability in Canberra is moderate (Spearman's rank order correlation coefficient = −0.647).

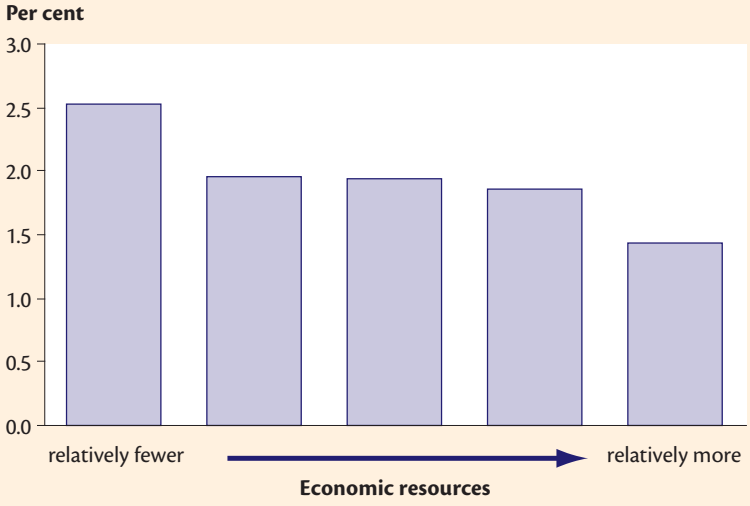

Figure 16: Percentage of Canberra residents aged 0–64 years with severe disability, by quintile of disadvantage of SLA of usual residence, 2006

Source: Table A1.

Discussion

This report illustrates the geographical distribution of severe disability within Australian capital cities. It confirms that there is considerable variation in the rate of disability within cities and that, while disability is less common in metropolitan areas than regional and remote areas at a broad level (AIHW 2008a), some local areas within cities still have relatively high rates of severe disability.

A correlation analysis of Census data found a strong relationship between an SLA's rank on the Index of Economic Resources and its rank in terms of severe disability rates. That is, the most disadvantaged SLAs within a capital city tended to have the highest rates of severe disability, while the most advantaged SLAs tended to have the lowest rates. This indicates a strong social gradient underlying the geographical distribution of severe disability in the cities.

The existence of a social gradient is not sufficient to attribute a direction of causality to the relationship between disability and disadvantage. The relationship may be driven by disability-related factors to some extent. For example:

- Disability can reduce a person's ability to earn income and accumulate wealth, so disability can be a direct cause of economic disadvantage at the individual level. Family members of people with disability may also reduce or cease employment in order to care for them (ABS 2004).
- People or households whose income is reduced by disability may move to relatively more disadvantaged areas in order to access low-cost housing.
- People with severe disability may cluster in more disadvantaged areas if disability-related services or accessible transport are located nearby, even though they may not necessarily experience high socioeconomic disadvantage at a personal level.

Conversely, socioeconomic disadvantage may cause or exacerbate disability (Lustig and Strauser 2007). Some specific examples of the mechanisms by which this can occur include:

- Various risk factors to health, such as smoking, sedentary or low exercise levels, little or no fruit intake and overweight/obesity, are more common among people living in more disadvantaged areas. These contribute to a higher burden of potentially disabling chronic disease among socioeconomically disadvantaged people (AIHW 2008b: p.65).
- Occupational risk factors to health are often higher for people in lower-status jobs (Niedhammer et al. 2008).

- People living in some geographical areas may be exposed to higher than average environmental risks to their health, such as industrial pollution or high ambient noise, which can contribute to the development or exacerbation of disability (Evans and Kantrowitz 2002). Further, subjective neighbourhood factors including perceptions of safety, social networks and traffic have been shown to affect self-rated mental health (Leslie and Cerin 2008).
- Psychological stress associated with poverty and social exclusion can contribute to a higher burden of mental illness among disadvantaged groups (Reijneveld and Schene 1998; Kuruvilla and Jacob 2007; ABS 2008c).

Finally, the association may be driven by a combination of both factors, or by a third factor common to disability and socioeconomic status. For example:

- Disability is common among public housing tenants (AIHW 2007: Table A5.6). If the public housing stock in a given city is clustered rather than spread throughout the city, there will be areas with a higher than average rate of disability as well as higher rates of other socioeconomically disadvantaged groups, such as people who are unemployed, low-income households and one-parent families.

Whether any of these explanations contribute to the social gradient of disability in Australian capital cities has not been investigated here. Questions worth further consideration include:

- Does the social gradient of disability exist at the individual or household level as well as the population level?
- To what extent is the social gradient of disability driven by specific aspects of disadvantage, such as income and wealth, occupation, or social factors?
- How does the geographical distribution of disability within cities relate to the spread of housing costs, access to public transport and location of services?
- Do the internal migration (within Australia) patterns of households with a member with disability differ from the general population—are they more or less likely to move within or between areas?
- How does distance affect the social gradient of disability in rural areas?

This analysis could also be replicated for different age groups. For example, it is not known if the strength of the social gradient is different for children or older people compared to working age adults. The geographical distribution of disability among children and older people has important implications for schools and aged care services, respectively.

Technical notes

Data were extracted using CDataOnline <http://www.abs.gov.au/CDataOnline>. Counts were based on place of usual residence.

The direct standardisation method, using 5-year age groups, was used to account for differences in disability rates between populations due to age and sex.

To calculate the average disability rate in each quintile of disadvantage, SLAs within each city were ranked according to their score on the Index of Economic Resources (ABS 2008b). SLAs were divided into quintiles for their city and the disability rate for the quintile was calculated adjusting for the size of the population in each SLA. For the quintile analysis of 'All capital cities' (shown in the summary and in Table A1, below), SLAs were ranked from all cities. That is, quintiles were benchmarked to the individual city or to the grouping of all cities, as appropriate. This means that SLAs in the most disadvantaged quintile in a given capital city will not necessarily also be in the most disadvantaged quintile of Australian capital cities as a whole.

The strength of the social gradient in each city was determined by calculating the Spearman rank order correlation coefficient for the given city. This a measure of the strength of association between two sets of ranks—in this case, an SLA's rank on the Index of Economic Resources and its rank in terms of the age-standardised rate of severe disability. The strength of the association in each city is given by a value between −1 and 1, where stronger relationships are indicated by values further away from 0. Significance tests found that there was a significant correlation (p<0.01) between the two ranks in each capital city, and when SLAs from all capitals were combined. However, a significant correlation does not imply directionality in the relationship between disability rates and socioeconomic disadvantage.

Validation testing

Parallel analyses using the Index of Relative Socio-Economic Disadvantage and the Index of Relative Socio-Economic Advantage and Disadvantage found a statistically significant correlation (p<0.001) between the rank of SLAs on both of these indices and their severe disability rank.

Analyses were also run comparing the age-standardised rate of severe disability in capital city SLAs with the percentage of people in each SLA living in relatively advantaged or relatively disadvantaged Collection Districts. A statistically significant (p<0.001) correlation was found for various advantage and disadvantage cut-off marks on the Index of Economic Resources.

Some SLAs had high non-response rates to the Census disability questions. To ensure consistent treatment of SLAs, the severe disability rate is reported as a percentage of persons who responded to the Census disability questions. This assumes that people who did not respond to the questions were no more or less likely to have severe disability than those who did respond. Investigation of the pattern of non-responses found that excluding 12 SLAs with a non-response rate of more than 20% had only a marginal effect on the strength of the social gradient, so they are included in the analyses presented here.

Tables containing the (age-standardised) percentage of the population aged 0–64 years with severe disability in each SLA, and the Index of Economic Resources for each SLA, can be downloaded from the AIHW website <www.aihw.gov.au/publications>.

Appendix tables

Table A1: Percentage of people aged 0–64 years with severe disability, by SLA quintile of disadvantage within each capital city, 2006

	relatively fewer economic resources				relatively more economic resources
	1	2	3	4	5
Sydney	2.9	2.5	1.9	1.5	1.1
Melbourne	2.8	2.5	1.9	1.9	1.4
Brisbane	3.5	2.6	2.1	1.6	1.5
Adelaide	4.0	3.0	2.5	2.1	1.5
Perth	2.5	2.0	2.2	1.7	1.3
Darwin	2.5	2.3	2.1	1.7	1.2
Canberra	2.5	1.9	1.9	1.9	1.4
All capitals	**3.2**	**2.4**	**2.0**	**1.7**	**1.3**

Notes

1. Percentages have been standardised to the age and sex structure of the Australian population on Census night 2006.
2. Excludes SLAs with fewer than 500 residents aged 0–64 years.
3. Quintiles have been ranked according to their score on the ABS Index of Economic Resources.

Source: AIHW analysis of ABS 2006 Census of Population and Housing.

Table A2: Percentage of Hobart residents aged 0–64 years with severe disability, by SLA Index of Economic Resources rank, 2006

	relatively fewer economic resources						relatively more economic resources
	1	2	3	4	5	6	7
Hobart	5.1	3.8	3.8	3.0	2.6	1.7	2.0

Notes

1. Percentages have been standardised to the age and sex structure of the Australian population on Census night 2006.
2. Excludes SLAs with fewer than 500 residents aged 0–64 years.

Source: AIHW analysis of ABS 2006 Census of Population and Housing.

Table A3: Statistical Local Areas included and excluded from analysis

	Number included	Number excluded	Percentage of population aged 0–64 years living in excluded SLAs
Sydney	64	—	—
Melbourne	79	—	—
Brisbane	210	5	0.1
Adelaide	54	—	—
Perth	36	1	0.1
Hobart	7	1	0.2
Darwin	37	4	1.3
Canberra	86	11	1.5
All capitals	**573**	**22**	**0.1**

Note: One SLA in Darwin and six SLAs in Canberra were excluded from the analysis because they have not been assigned a score on the Index of Economic Resources. The remaining SLAs were excluded because they had fewer than 500 usual residents aged 0–64 years.

Source: AIHW analysis of ABS 2006 Census of Population and Housing.

Table A4: Variables underlying the Index of Economic Resources

Variable topic	Variable description (per cent)
Income	People with stated annual household equivalised income between $13,000 and $20,799 (approx. 2nd and 3rd deciles)
	People with stated annual household equivalised income greater than $52,000 (approx. 9th and 10th deciles)
Employment	People aged 15 years or over who are unemployed
Housing	Occupied private dwellings with four or more bedrooms
	Households paying mortgage who pay more than $2,120 per month
	Households paying rent who pay more than $290 per week
	Households paying rent who pay less than $120 per week (excluding $0 per week)
	Households owning the dwelling they occupy (without a mortgage)
	Households owning the dwelling they occupy (with a mortgage)
	Occupied private dwellings requiring one or more extra bedrooms (based on Canadian National Occupancy Standard)
	Households renting from a Government or Community Organisation
Other	Households that are lone person households
	Occupied private dwellings with no car
	Families that are one-parent families with dependent offspring only
	Occupied private dwelling with at least one person who is an owner of an unincorporated enterprise

Source: ABS 2008a.

Table A5: Persons aged 0–64 years living in Australian capital cities: per cent with severe disability by SLA of usual residence, 2006

Available online at <www.aihw.gov.au/publications>

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