Patterns of fall injury in an ageing population in South Australia

A challenge for prevention and care

Jerry Moller

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ABN 95 940 029 131
Injury Prevention and Health Research Consultants
15 Hartley Street Flagstaff Hill South Australia 5159
Phone: Int+ 61 (0)8 8270 1004 Fax: Int+61 (0)8 8270 1217
Email: jmoller@senet.com.au

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Executive summary

This document has been generated for planning purposes. It shows how the cost of falls injury among people over 65 years is likely to change if the present patterns of incidence rates and service delivery responses are maintained. It describes the possible impact of population ageing on falls injury costs and service utilisation.

Clearly there are a number of factors that may influence these projections

- Population projections of the older population may not reflect the changes that actually occur. The population projection data used as a base were generated from the 1996 Census and do not carry the current endorsement of the Cabinet. They are however the best available at this time.

- Fall injury incidence may change due to changes in risk factors related to lifetime diet and exercise patterns.

- Treatment responses such as the proportion of cases that are admitted following a fall injury and length of stay may change

- The mix of places of residence may change, modifying the exposure to risk factors at home

These projections therefore do not provide an absolute measure. Care has been taken to choose relatively conservative indicators. The use of AIHW costs that control for co-morbidity, lessens the likelihood of double counting costs. Likewise the falls bed day indicator used does not include overnight stays. The picture that emerges therefore is one that is considered as a realistic assessment of the impact of population change on fall injury burden among older people if no action is taken to prevent falls injury or modify treatment patterns.

The major findings are:

- Falls injury costs will rise steeply over the next fifty years as a result of demographic change unless there is a large decrease in incidence or reduction in treatment costs per patient. Costs will rise by approximately 30% by 2011 and will treble over the first 50 years of the millennium.

- The pattern of ageing is similar in other states in Australia, but ageing is occurring earlier in South Australia.

- If the incidence of fall injury is not controlled, the cost of treatment is likely to rise significantly, making it difficult to fund future prevention efforts. A window of opportunity currently exists to break the cycle through prevention.

- Femur fractures account for less than 20% of the bed days provided for the treatment of fall injuries. This indicates that while fracture prevention is important, wider strategies are needed.

- The impact will not be spread evenly across the state. Suburbs that were only a short time ago full of young families will increasingly become the home of older people. The major change will be seen in the middle ring suburbs such as Happy Valley, Modbury and Tea Tree Gully.

- In rural areas the nature of the change will be variable. Some places like Victor Harbor have already experienced ageing and the rises there will be moderate. Other newer retirement areas such as the Riverland, Yorke Peninsula, Mount Gambier, Whyalla and Port Lincoln will experience greater changes.

- In declining rural areas the population may age dramatically, but the impact on costs will be low due to the small population. For the residents of these areas however, the support of younger people may decline dramatically, resulting in increased need for services. The impact on individuals and families may be considerable.

- There is growing evidence that prevention strategies can reduce the incidence and severity of fall injury among older people. At present most of the evidence relates to prevention among the population at highest risk, but there is increasing evidence about the positive effect of gentle exercise and the possibility that early prevention strategies may be effective.

Recommended approaches

It is recommended that

- ✓ Fall injury prevention is systematic and comprehensive with programs designed to meet the specific needs of local areas.

- ✓ South Australia develops a policy similar to NSW, combining early prevention and a falls immunisation approach with settings based prevention strategies in the community, acute care and residential care facilities.

- ✓ Research and training is supported as an active part of the policy in order to identify and implement new strategies for falls injury prevention.

Background

Falls among older people are a national health priority. The risk of a fall injury rises exponentially over the age of sixty five so that those in their eighties have a ninefold increase in risk. When this is combined with an ageing population that is experiencing an extended lifespan, the number of fall injuries can be expected to rise dramatically if the rate of injury remains the same.

A recent study by Chipchase et al[1] has shown that in recent years the age standardised rate of femur fracture has remained almost constant in South Australia. This suggests that the preventive interventions in place to date have not had a significant impact at population level despite evidence for their effectiveness in clinical trials.

This paper projects the costs and resources likely to be consumed in treating fall injury among people over the age of sixty-five years, as the population of South Australia ages, if there is no reduction in the rate or severity of fall injury.

Population projections take into account what is known about patterns of migration, birth and death rates and overall economic changes. They provide an estimate of change rather than a measure. They will be most accurate for the first few years of the projection and then should be treated with more caution as the length of the projection increases. The overall size of the population over 65 years of age is possibly the most reliable part of population projection estimates, due to lower levels of migration at this age.

The government of South Australia has counselled caution in the use of population projections. The models for projection of population in SA are under review. The projections used here are the latest available but Cabinet does not endorse them.

For this study we have taken a very long-term view for the whole of state population to 2051 and a moderately long-term view at local level. This has been done because there is a need to consider how the likely increase in the age of the population in the long term will create strong demand for treatment services related to falls. The basis for planning and justifying prevention is the future cost not the present cost. The demographic changes are so marked that it is unlikely that future population projection models will dramatically change the estimates in this paper. On the other hand the purpose of this paper is to spark interest and debate about falls injury prevention. It is hoped that coordinated fall injury prevention strategies will markedly change the rate of falls injury and that the predicted large increase in demand for services can be offset significantly.

[1] Chipchase, L. S.; McCaul, K.; Hearn, T. C.Hip fracture rates in South Australia: Into the next century: Reply Australian and New Zealand Journal of Surgery, 2000, vol. 70, no. 11, pp. 813

Sanders, K. M.; Kotowicz, M. A.; Pasco, J. A.; McArthur, R.; Nicholson, G. C. Hip fracture rates in South Australia: Into the next century: CommentAustralian and New Zealand Journal of Surgery, 2000, vol. 70, no. 11, pp. 813

Methods

Applying Australian Bureau of Statistics population projections to age specific consumption rates is used to project fall injury resource consumption. Two sets of population projections are used. Long term projections to 2051 for the whole of South Australia have been obtained from ABS Cat 3222.0 Population Projections 1997-2051. Series 1 projections have been used because they most closely align with shorter-term data for South Australia. The shorter-term projections are available for each statistical local area (SLA). ABS South Australia has calculated these data from the 1996 Census. They cover the period to 2019.

Costs and service utilisation have been calculated using data published by the Australian Institute of Health and Welfare.[2] This information provides estimates of service use and costs of service for Australia based on 1993-94 health data. The project ensured that costs were not duplicated and that co-morbidities were taken into consideration. Age and sex specific utilisation and costs were calculated from the AIHW data and applied to the population structure of South Australia for each projected year and location. It must be remembered that costs are 1993-94 costs and represent the average cost across the Australian Health system. The estimates are therefore likely to be conservative and costs and treatment patterns in local areas may be quite different from the National norm.

The local differences have been studied by using actual bed day data from South Australia. Hospital separation data for 1999-2000 were used. A subset of cases where the external cause was a fall, where the length of stay was more than one day but less than 365 days was extracted and bed days for these cases calculated for each SLA.. In addition from this subset cases where there was a fractured femur were extracted and bed days associated with these were also calculated. Single day length of stay cases were excluded as analysis of Australian data by the Flinders University Centre for Injury Studies has shown that overnight admission policies vary greatly from place to place and time to time for reasons that are not related to the severity of the injury.

The bed day counts were stratified by five-year age groups from 65 years to 84 years and 85 plus and by sex. The age and sex specific rates for each indicator were then applied to the projected populations.

It should be expected that the bed day projections obtained by this method would be higher than the estimates based on the AIHW data. There has been no attempt to control for co-morbidities. Nevertheless, these data are capable of showing different patterns of admission in different areas. For example, a location with poor access to nursing home facilities is likely to keep patients in hospital care for longer. By comparing the local bed day estimates based on actual bed day data, with the AIHW based estimates, local areas can see whether their service provision is similar to other areas and the whole of the state. Experience in other states has shown that local knowledge is important in assessing the meaning of these comparisons.

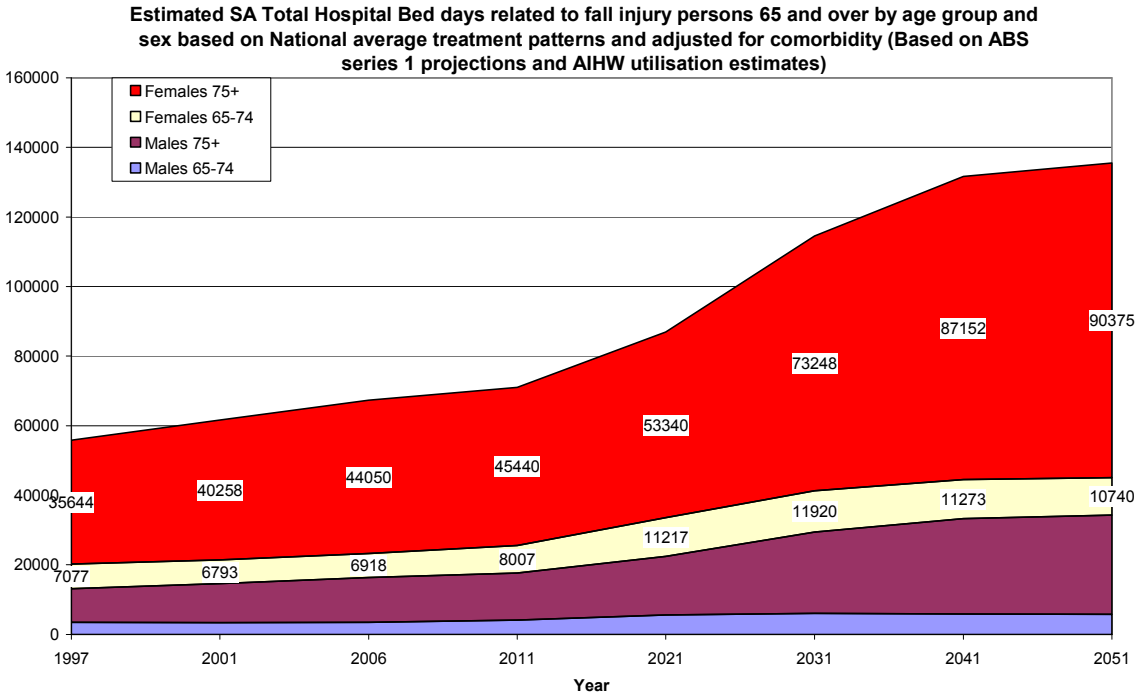
The information derived should be considered as a series of indicators rather than an absolute measurement of costs and service needs. The percentage change in indicators provides a sound estimate of the rate of change that can be expected for each area. The absolute cost data should be treated as orders of magnitude rather than actual dollar cost changes. In general estimates are likely to be conservative. They therefore serve to identify the magnitude of the likely impact of the changing population on health services.

[2] Mathers C and Penm R Health system costs of injury poisoning and musculo skeletal disorders in Australia 1993-1994 AIHW Canberra 1999

Overview for South Australia

If the numbers of people over the age of 65 years have been accurately projected and no changes are experienced in the rate of fall injury or patterns of treatment, the number of bed days required will more than double over the next 50 years. While a moderate rise is expected in the next eight to ten years, the movement of the baby boom generation into the highest risk age groups for fall injury above 75 years is expected to create a much sharper increase from 2011. The change in population shape and the exponential rise in risk of fall injury generate this after age 65 years. A nine fold increase in hospitalisation rates is seen among those over 85 years compared to those aged 65 years.

This pattern is seen in all states of Australia and much of the developed Western world. South Australia is ageing slightly earlier than other states. It therefore has a slightly smaller window of opportunity to put prevention strategies in place to offset the expected demand.



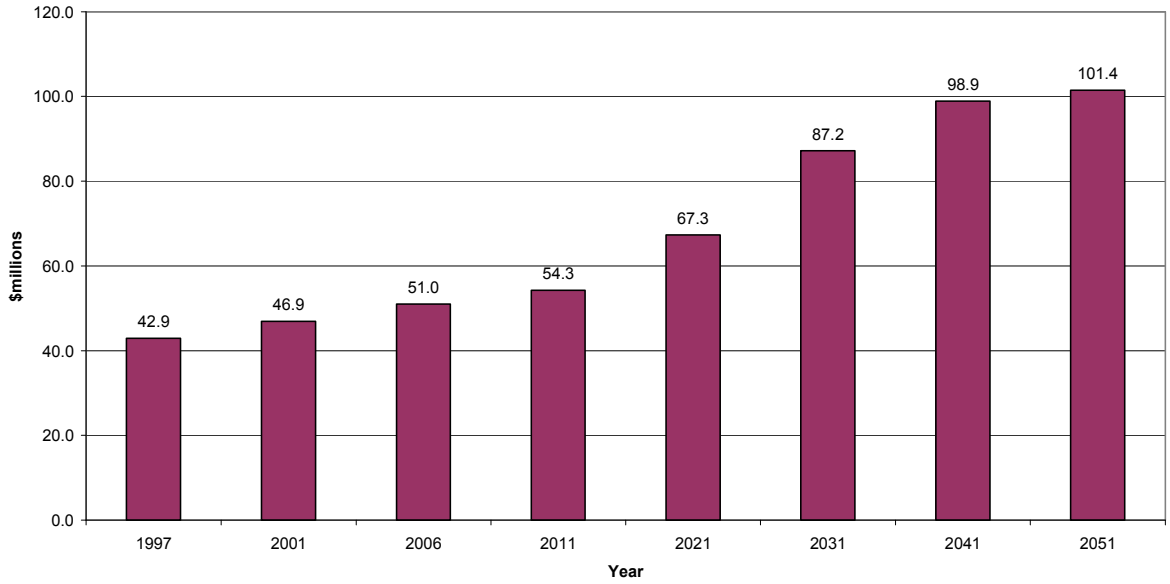
Based on national rates of service provision, at a 90% average occupancy rate a total of 242 hospital beds will need to be provided to deal with the expected rise in bed day demand. In addition, places for 316 nursing home residents will be needed.

The AIHW has estimated the Australian average health service costs and utilisation of services related to fall injury. These have been applied to the population projections to estimate projected costs. The AIHW data have been used because the method of calculation takes into account the co-morbidities that contribute to bed days among older people. The total of all AIHW estimates sum to the total actual health expenditure for 1993 – 94. The cost estimates are based on per capita costs in 1994 dollars applied to the estimated populations. No adjustment has been made for inflation of health care costs. The AIHW estimates do not differentiate age groups above 75 years. As there is a marked increase in the rate of fall injury and possibly costs in the 75-80 and 80-85 year old populations, the estimates must be

considered as conservative. Indeed when similar projections are applied to actual bed days provided in 1999-2000 in SA and five year age groups to 85 plus are used, this shows larger increases in populations where a significant number of people over eighty are present.

The AIHW based estimates must therefore be considered as conservative. Actual costs are likely to be higher than those presented here.

Estimated SA Total Annual Health service costs(millions) related to fall injury based on National average treatment patterns and adjusted for comorbidity (Based on ABS series 1 projections and AIHW Utilisation estimates)



It is clear that very large increases in costs related to fall injuries are likely to occur over the next 50 years with a rapid increase from 2011. The increases expected before this time are in the order of 25% between 2000 and 2010. These cost pressures are likely to make early prevention targeted at reducing the post 2011 impact difficult unless specific allocations are made.

One of the more severe injuries created by a fall is a fractured femur. The use of hip protectors has been identified as a possible intervention strategy. It is important therefore to consider what proportion of bed days are related to femur fractures.

- Table 1 Fall related bed days by type of injury and sex South Australia 1999-2000

	# Femur	Other fall injury	Total
Males	3051	17233	20284
%	15.0%	85.0%	100.0%
Females	7445	37068	44513
%	16.7%	83.3%	100.0%
Total	**10496**	**54301**	**64797**
% of bed days	16.2%	83.8%	100.0%

Table 1 shows that # femur accounted for 16.2% of fall related bed days (see indicator definition) in 1999-2000 with only a small difference in males and females with females

experiencing a slightly higher proportion. While femur fractures average a length of stay between 10 and 14 days, they account for less than a fifth of all bed days. The more numerous other types of injury, many of which have much lower lengths of stay, contribute more than 80% of the bed day load.

Impacts on specific local areas

The impacts on local areas are far from uniform. Some older people tend to retire near water and in warmer areas. Others tend to remain living where they always have and age in place. Some local areas have already aged and the proportion of the population that is elderly will not increase as much as in other areas.

Table 2 & Table 3 show projected total health care costs for each 1996 Statistical Local Area. The SLA boundaries have been used in preference to later Local Government Area boundaries because it is clear that the distribution of change is not within the larger LGAs and working with small areas is more valuable. In some areas populations and fall injury numbers are low and caution should be taken in interpreting the data. Careful use of the data provides some interesting insights into the likely patterns that may emerge.

The populations in the middle ring suburbs about 20km from the city are likely to age rapidly. Movement to towns near the water such as Victor Harbor will continue and other areas will become new havens for retired people. There is also some suggestion that the frail elderly who are at greatest risk of fall injury may move to areas where there are higher level treatment and support facilities. In some country areas this will mean that those who remain resident in the towns with lower facility levels will be healthier and at lower risk of fall injury. Careful planning will be needed to understand these patterns and to provide the optimal mix of prevention and treatment services.

Table 2 is ranked in order of percentage change showing how the relative impact on areas is spread across a wide variety of types of setting. Table 3 presents the same data in order of absolute cost impacts. This shows how a mix of demographic change and population size determines where the major impacts will occur.

- Table 2 Change in total health care costs 1999-2019 by Statistical local area ranked by percentage change

SLA	Change in Total health cost %	Change in Total health cost $000	Rank of % change	Rank of $ change
Happy Valley (C)	187%	1076	1	5
Munno Para (C)	181%	1174	2	4
Browns Well (DC)	156%	4	3	104
East Torrens (DC)	156%	192	4	26
Unincorp. Flinders Ranges	150%	16	5	84
Light (DC)	142%	187	6	28
Tea Tree Gully (C)	140%	2671	7	1
Mount Barker (DC)	130%	703	8	9
Mount Gambier (DC)	129%	144	9	40
Salisbury (C)	121%	2625	10	2

SLA	Change in Total health cost %	Change in Total health cost $000	Rank of % change	Rank of $ change
Mallala (DC)	117%	147	11	39
Dudley (DC)	108%	29	12	73
Pirie (DC)	102%	34	13	71
Barossa (DC)	98%	111	14	46
Noarlunga (C)	98%	2173	15	3
Coober Pedy (DC)	97%	51	16	61
Peterborough (DC)	95%	7	17	100
Onkaparinga (DC)	93%	219	18	24
Stirling (DC)	91%	322	19	18
Hallett (DC)	89%	12	20	91
Gumeracha (DC)	87%	112	21	45
Gawler (M)	86%	542	22	12
Whyalla (C)	85%	510	23	14
Lower Eyre Peninsula (DC)	84%	101	24	48
Yankalilla (DC)	82%	128	25	42
Willunga (DC)	82%	397	26	16
Roxby Downs (M)	82%	10	27	94
Unincorp. Far North	76%	40	28	66
Strathalbyn (DC)	74%	177	29	31
Port Elliot & Goolwa (DC)	67%	300	30	20
Elliston (DC)	67%	21	31	80
Millicent (DC)	67%	177	32	32
Waikerie (DC)	66%	124	33	43
Murray Bridge (DC)	66%	382	34	17
Kapunda (DC)	63%	83	35	52
Warooka (DC)	61%	25	36	77
Mount Gambier (C)	60%	412	37	15
Campbelltown (C)	59%	1019	38	7
Renmark (M)	59%	156	39	38
Port MacDonnell (DC)	58%	44	40	64
Coonalpyn Downs (DC)	58%	18	41	81
Ridley-Truro (DC)	55%	42	42	65
Angaston (DC)	55%	159	43	35
Paringa (DC)	55%	28	44	74
Tanunda (DC)	52%	104	45	47
Lacepede (DC)	52%	47	46	63
Robertstown (DC)	51%	13	47	89
Clare (DC)	48%	82	48	53
Penola (DC)	48%	53	49	60
Tumby Bay (DC)	48%	58	50	58
Loxton (DC)	47%	122	51	44
Peake (DC)	47%	9	52	96
Port Augusta (C)	45%	158	53	36
Victor Harbor (DC)	44%	312	54	19
Cleve (DC)	44%	28	55	75
Port Lincoln (C)	43%	181	56	30
Berri (DC)	42%	78	57	55
Ceduna (DC)	42%	31	58	72
Hawker (DC)	41%	6	59	102
Port Pirie (C)	40%	209	60	25
Streaky Bay (DC)	40%	22	61	79

SLA	Change in Total health cost %	Change in Total health cost $000	Rank of % change	Rank of $ change
Northern Yorke Peninsula (DC)	40%	156	62	37
Le Hunte (DC)	39%	17	63	82
Mannum (DC)	38%	59	64	57
Central Yorke Peninsula (DC)	38%	92	65	51
Tatiara (DC)	38%	78	66	54
Adelaide (C)	38%	166	67	33
Naracoorte (DC)	38%	12	68	92
Morgan (DC)	36%	16	69	83
Burnside (C)	34%	681	70	10
Kingscote (DC)	33%	37	71	69
Marion (C)	31%	1021	72	6
Meningie (DC)	30%	39	73	68
St Peters (M)	30%	95	74	50
Barmera (DC)	28%	51	75	62
Naracoorte (M)	26%	57	76	59
Enfield (C) - Pt A	26%	527	77	13
Hindmarsh and Woodville (C)	25%	1014	78	8
Mitcham (C)	24%	640	79	11
Blyth-Snowtown (DC)	23%	15	80	86
Robe (DC)	23%	13	81	87
Minlaton (DC)	22%	27	82	76
Walkerville (M)	20%	75	83	56
Saddleworth & Auburn (DC)	20%	13	84	88
Elizabeth (C)	20%	181	85	29
Payneham (C)	19%	190	86	27
Prospect (C)	19%	138	87	41
Port Adelaide (C)	19%	279	88	22
Brighton (C)	18%	250	89	23
Mount Pleasant (DC)	18%	12	90	90
Wallaroo (M)	17%	24	91	78
Spalding (DC)	17%	2	92	105
Henley & Grange (C)	16%	100	93	49
Riverton (DC)	16%	12	94	93
Mount Remarkable (DC)	14%	15	95	85
Kanyaka-Quorn (DC)	14%	8	96	97
Thebarton (M)	14%	39	97	67
West Torrens (C)	13%	300	98	21
Franklin Harbor (DC)	13%	8	99	98
Kimba (DC)	12%	6	100	101
Unley (C)	11%	165	101	34
Unincorp. Whyalla	11%	1	102	106
Kensington & Norwood (C)	8%	36	103	70
Burra Burra (DC)	8%	5	104	103
Jamestown (DC)	7%	7	105	99
Wakefield Plains (DC)	5%	9	106	95
Bute (DC)	1%	0	107	107
Carrieton (DC)	0%	0	108	108
Unincorp. Lincoln	0%	0	108	108
Unincorp. Murray Mallee	0%	0	108	108
Unincorp. Riverland	0%	0	108	108
Unincorp. Western	0%	0	108	108

SLA	Change in Total health cost %	Change in Total health cost $000	Rank of % change	Rank of $ change
Unincorp. Yorke	0%	0	108	108
Unincorp. West Coast	0%	0	108	114
Eudunda (DC)	-1%	-1	115	116
Lucindale (DC)	-2%	-1	116	115
Enfield (C) - Pt B	-3%	-20	117	128
Glenelg (C)	-3%	-26	118	129
Peterborough (M)	-3%	-3	119	119
Yorketown (DC)	-3%	-6	120	123
Pinnaroo (DC)	-4%	-2	121	117
Beachport (DC)	-5%	-2	122	118
Karoonda-East Murray (DC)	-6%	-3	123	120
Crystal Brook-Redhill (DC)	-7%	-7	124	125
Rocky River (DC)	-9%	-7	125	124
Lameroo (DC)	-11%	-5	126	122
Port Broughton (DC)	-16%	-14	127	127
Orroroo (DC)	-24%	-11	128	126
Unincorp. Pirie	-34%	-4	129	121

- Table 3 Change in total health care costs 1999-2019 by Statistical local area ranked by total $ change

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Kapunda (DC)	63%	83	35	52
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Tatiara (DC)	38%	78	66	54
Berri (DC)	42%	78	57	55
Walkerville (M)	20%	75	83	56
Mannum (DC)	38%	59	64	57
Tumby Bay (DC)	48%	58	50	58
Naracoorte (M)	26%	57	76	59
Penola (DC)	48%	53	49	60
Coober Pedy (DC)	97%	51	16	61
Barmera (DC)	28%	51	75	62
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Robe (DC)	23%	13	81	87
Saddleworth & Auburn (DC)	20%	13	84	88
Robertstown (DC)	51%	13	47	89
Mount Pleasant (DC)	18%	12	90	90
Hallett (DC)	89%	12	20	91
Naracoorte (DC)	38%	12	68	92
Riverton (DC)	16%	12	94	93
Roxby Downs (M)	82%	10	27	94
Wakefield Plains (DC)	5%	9	106	95
Peake (DC)	47%	9	52	96
Kanyaka-Quorn (DC)	14%	8	96	97
Franklin Harbor (DC)	13%	8	99	98
Jamestown (DC)	7%	7	105	99
Peterborough (DC)	95%	7	17	100
Kimba (DC)	12%	6	100	101
Hawker (DC)	41%	6	59	102
Burra Burra (DC)	8%	5	104	103
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Spalding (DC)	17%	2	92	105
Unincorp. Whyalla	11%	1	102	106
Bute (DC)	1%	0	107	107
Carrieton (DC)	0%	0	108	108
Unincorp. Lincoln	0%	0	108	108
Unincorp. Murray Mallee	0%	0	108	108
Unincorp. Riverland	0%	0	108	108
Unincorp. Western	0%	0	108	108
Unincorp. Yorke	0%	0	108	108
Unincorp. West Coast	0%	0	108	114
Lucindale (DC)	-2%	-1	116	115
Eudunda (DC)	-1%	-1	115	116
Pinnaroo (DC)	-4%	-2	121	117
Beachport (DC)	-5%	-2	122	118
Peterborough (M)	-3%	-3	119	119
Karoonda-East Murray (DC)	-6%	-3	123	120
Unincorp. Pirie	-34%	-4	129	121
Lameroo (DC)	-11%	-5	126	122
Yorketown (DC)	-3%	-6	120	123
Rocky River (DC)	-9%	-7	125	124
Crystal Brook-Redhill (DC)	-7%	-7	124	125
Orroroo (DC)	-24%	-11	128	126
Port Broughton (DC)	-16%	-14	127	127
Enfield (C) - Pt B	-3%	-20	117	128

SLA	Change in Total health cost %	Change in Total health cost $000	Rank of % change	Rank of $ change
Glenelg (C)	-3%	-26	118	129

Management strategies

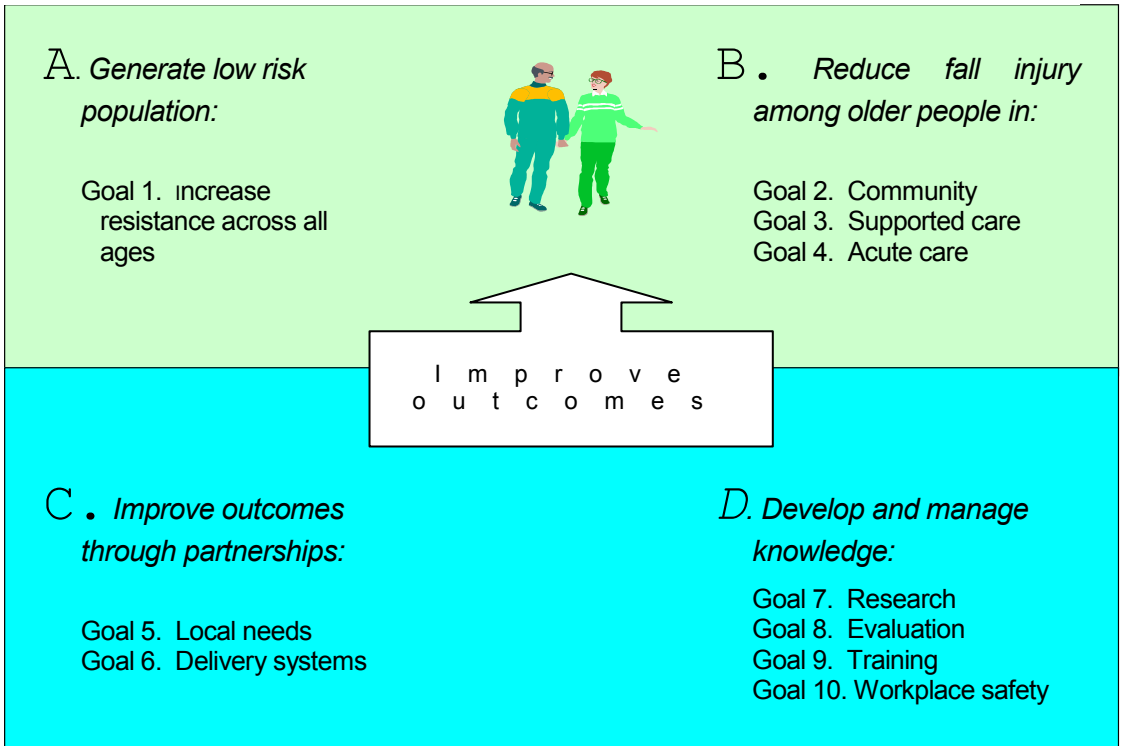
The cost of treating fall injury is already rising with the ageing of the population. This will increase more rapidly after 2011. The cost increases appear to be so large that, in the near future, available resources will be consumed by treatment and the opportunity for prevention will have disappeared. There is an immediate window of opportunity for prevention.

In New South Wales a comprehensive fall injury prevention policy has been developed. This policy focuses on early prevention strategies dealing with those who will reach the high risk age group of over 75 in the next 10 to 40 years and implementation of specific prevention strategies for those at risk in community, acute care and supported care settings. This is accompanied by a training, research and development strategy to assist the roll out of prevention and care. The changes are tightly linked to quality processes in health care and to Occupational Health and Safety of workers.

The structure of the NSW policy is shown in Figure 1. The interventions under the policy are built on the evidence of effective prevention strategies and on developing evidence where adequate studies have not yet been undertaken at population level. There are many areas where controlled trials have shown the effectiveness of individual interventions but evidence is lacking on the population effectiveness of these. Effective fall injury prevention requires that all risk factors for an individual are managed simultaneously and that emerging risk factors are identified as soon as they emerge. The management responses will range from environmental strategies to reduce the risk of falling, increasing resistance to injury and identification and amelioration of individual clinical risk factors.

- Figure 1 NSW Fall injury Policy structure

Management policy to reduce fall injury among older people
NSW Health, 2001-2005



In South Australia the population ageing process is more advanced already. The window of opportunity for prevention is therefore shorter. This however should not deter efforts aimed at reducing the fall injury rate. Prevention strategies will need to be clearly defined and targeted. The current focus on preventing the falls that occur today and treating the injuries that occur will need to be broadened.

Older people can be brought onside. This paper only identifies health systems costs. Older people are very aware that a fall injury can result in a loss of confidence, independence and freedom. They are willing partners in prevention provided it is targeted in a positive way and uses approaches that promote independence and dignity. The vision in NSW is for a broad partnership to provide benefits both to older people and the health system.

Detailed projections by statistical local area

Appendix 1 Detailed projected Indicators

Listed in alphabetical order of Statistical Local Area

This section provides detailed information about each statistical area. Users are reminded that population projections indicate likely changes, but they become increasingly inaccurate as the period of the projection increases. Cabinet is currently reviewing the population projections to be used by the SA government. The projections used here were created by the Australian Bureau of Statistics from 1996 Census data and may be based on different assumptions to those to be used in later projections.

Three indicators are provided.

1. Short term projections of population changes based on local ABS estimates. This indicator shows how the balance of young and old will change between 2001 sand 2019

2. Cost and utilisation projections based on AIHW national resource usage in 1993-94 controlling for co-morbidities. The indicator is likely to be conservative in estimating the overall costs for South Australia. The AIHW approach groups all ages above 75 years. The risk of falls injury increases rapidly past the age of 75 years. The impact of this coarser grouping can be assessed by comparing percentage changes on the AIHW bed day indicator with those for actual bed day data where the separate ages to 85+ are used.

2a This indicator provides estimates of the costs of services related to fall injury based on the average cost across Australia. The **actual** costs in South Australia and each local area may differ from this. It is important to take this indicator as a broad indication of how the local population change will produce changes in specific and overall cost if the costs followed the Australian average

2b This indicator provides estimates of changes in demand for a range of services. As indicated above, the actual pattern of service provision may vary from this due to differing levels of health in different populations, differences in access to nursing home facilities and the capacity for the community to care for older people at home. This is an indicator only and should not be viewed as a measure of the actual change in demand. It helps to focus on the impact of fall injury on local services.

The final indicator shows projections of fall injury related bed days based on actual bed day provision in 1999-2000 and ABS population estimates. This indicator should be interpreted against the bed day estimates in indicator 3, to see if local patterns are very different from the national average estimates for this population mix. Over the whole state this indicator is about 20% higher than the national average estimate. This is because the indicators do not match exactly and there has been no attempt to control for co-morbidity. If the estimates for a local area are very different, say more than 50% above or 30% below the estimate in indicator 2, it is necessary to consider why this is the case.

Possible explanations include,

- The total number of cases on which the projection is based is very small resulting in large errors of estimate
- Lack of access to nursing homes making hospital stays longer
- The local population has a higher or lower risk than average

- A small geographic area with a few very high risk patients with high levels of co-morbidity

- Falls among patients experiencing a long stay related to another cause.

It should also be noted that the predicted rises for this indicator tend to be higher than for the nationally derived indicators. This is because the National data brackets together all persons over the age of 75 whereas the State data separates out older people into 75-79, 80-84 and 85+. The fall risk increases exponentially with age so a finer age breakdown provides a more accurate estimate of likely increases.

The indicators should be used for general planning purposes. They can guide the mix of fall injury prevention strategies to be used and the design of service responses. For example in the ring suburbs of Adelaide very large increases in the aged population and in fall injury costs are anticipated in ten years time. The major increase will occur as the proportion of the population over 75 years of age increases. Gentle exercise strategies and maintenance of active lifestyles among those who are retiring now are likely to reduce the fall injury load among this cohort. In retirement towns, the population has already aged. While gentle exercise programs are still required there will be more focus on providing assessment services and treating conditions that contribute to fall injury.

Appendix 2 Data issues

There are differences in the long and short-term projection models. These have an impact on the estimates of resources use. Figure 2 below shows the size of the differences created in bed day projections. The long-term forecasts are likely to prove to be conservative.

- Figure 2 Illustration of the impact of the differences in projected population estimates on bed day demand projections