5 Analysis of person outcomes

5.1 Factors affecting entry into RAC from hospital

Of particular interest is whether personal characteristics and a person's experience in hospital can help predict whether they will be admitted to RAC when they are discharged from hospital. Identifying whether a range of factors influence the outcome can be done using logistic regression models. Fitting such models allows us to bring together the various elements considered individually in Section 3 so that factors underlying observed differences in entry into RAC from hospital can be identified.

Two logistic regression models were fitted to identify, firstly, factors associated with whether a person was admitted to RAC on leaving hospital, and, secondly, if they were admitted to RAC whether they went into permanent or respite care. The two models are:

- Model A for people who returned to the community or were admitted into RAC following discharge from hospital. This model estimates the probability that a person in hospital would be admitted to RAC rather than return to the community.
- Model B for people who were admitted into RAC following discharge from hospital. This model estimates the probability that a person in hospital would be admitted into permanent rather than respite RAC, given that it was known that the person would be moving into RAC from hospital.

Note that as we are interested only in people who could possibly be admitted into RAC, people identified as either dying in hospital or returning to RAC from hospital were excluded from both models. Variables used in the analysis were:

- age at hospital admission
- sex
- state/territory of hospital
- remoteness of usual residence (prior to hospitalisation)
- marital status
- English proficiency (EP) group, which is based on reported country of birth using the 2001 classification of countries into English Proficiency Groups (see Appendix D)
- hospital sector
- care type in hospital prior to discharge
- hospital mode of admission
- length of hospital episode
- principal diagnosis
- presence or absence of specific diseases as additional diagnoses.

Results from fitting the above models are summarised below. An explanation of logistic regression models, interpretation of results, specifications of the variables used for models A

and B and the final fitted models are given in Appendix E. Models were fitted using unadjusted data.

5.1.1 Propensity to be discharged to RAC

An estimated 845,000 people aged 65 years and over were discharged from hospital either to be admitted into RAC (respite and permanent) or to return to the community. Of these, 3.6% were admitted into RAC directly following discharge from hospital.

When fitting Model A, the most significant predictors of entry into RAC rather than a return to the community from hospital were:

- principal diagnosis
- an additional diagnosis of 'Awaiting admission elsewhere'
- the duration of the hospital episode before discharge
- age
- an additional diagnosis of dementia and related disorders
- hospital mode of admission (that is, from within the hospital system or from the community)
- state or territory of hospital admission
- hospital care type prior to discharge.

Marital status and EP group also had statistically significant effects (see Table E.1 for fitted Model A).

A summary of the main results from the logistic regression model is given below. The effects of particular variables can be seen by comparing predicted probabilities of being admitted into RAC (as opposed to the community). Such comparisons are most easily understood in reference to a person with specific characteristics. The probabilities then relate to a person with characteristics the same as those of the 'reference' person except for the difference in the single variable whose effect is being considered.

The characteristics of the reference person used for the following discussion are described in Box 5.1. These values were chosen because in most cases for each variable they were the most common. The traits of this person (in particular that she was aged 75, was discharged from acute care after a short stay for treatment for a tumour or cancer) mean that she was unlikely to have been admitted into RAC on discharge from hospital: the predicted probability of this happening is 0.4%, compared with an observed rate of discharge to RAC across all discharges of 3.6%. In the discussion below, the effect of a particular variable on the predicted probability of discharge to RAC is illustrated by comparing the predicted probability for the reference person (0.4%) with that for an adjusted reference person, where the adjusted reference person differs from the reference person in only the single characteristic being discussed.

If a person differs from the reference person in several characteristics much larger differences in the predicted probabilities would be observed. For example, a person who was different from the reference person by being aged 85, widowed, with a principal diagnosis of dementia, in hospital for 8 to 12 weeks in GEM after changing care type (that is, a statistical admission), has a predicted probability of 83% and so would have been highly likely to have been discharged to RAC.

Model A reflects the relationships seen in other analyses in this report between principal diagnosis and transition into RAC (see tables 3.16 and 6.2). People with a principal diagnosis of 'Awaiting admission elsewhere' or 'Dementia and related disorders' have the highest predicted probabilities of admission into RAC (5.2% and 3.9%for reference person adjusted with respect to principal diagnosis to these two categories respectively) (Table E.1). Not surprisingly, given the effect of principal diagnosis upon RAC admission, additional diagnoses of 'Awaiting admission elsewhere' and 'Dementia and related disorders' were also associated with an increased likelihood of being admitted to RAC from hospital rather than returning to the community—by nearly 12 times and just over 3 times, respectively (Table E.1).

Box 5.1:Reference person for comparison for Model A (discharge to community or RAC admission)

For this analysis the reference person used for comparing predicted probabilities has the following characteristics:

- *75 years old at admission into hospital*
- *female*
- *married/de facto*
- *born in Australia*
- *usual residence in a major city*
- *admitted to a hospital in New South Wales*
- *in a public hospital*
- *hospital mode of admission was not a transfer from another hospital or the result of a change in care type*
- *receiving acute care in hospital*
- *hospital episode duration of less than 1 week*
- *a principal diagnosis of neoplasm.*

These values were chosen because in most cases within each variable they were the most common.

The predicted probability of this person being admitted to RAC from hospital is low at 0.4%. Therefore the predicted probability of this person returning to the community is 99.6%. Details of how to calculate predicted probabilities of admission into RAC for other combinations of variable values are given in Appendix E.

Longer hospital episodes were associated with an increased likelihood of admission into RAC rather than a return to the community (Table E.1). The reference person, with a hospital episode prior to discharge lasting for less than 1 week, has a 0.4% predicted probability of entering RAC. This compares with a predicted probability of 1.5% if the episode had lasted for 1–4 weeks, 4.3% if it had been for 4–8 weeks and rising to 7% if the episode had been for 12 weeks or more. These results are consistent with the analysis of length of stay by movement type (Table 3.5), where the median length of stay in hospital was 24 days for people moving into permanent RAC, 14 days for people moving into respite RAC, and 4 days for people returning to the community.

As expected, older age was associated with an increased likelihood of entering RAC from hospital rather than returning to the community (Table E.1). A 65 year-old was nearly half as likely to be discharged to RAC (0.2% predicted probability for adjusted reference person) as a 75 year old, while a 95 year-old was over four times as likely to have this destination (1.8% predicted probability for adjusted reference person). This ties in well with earlier analysis (Table 3.6), which indicated that people moving into RAC from hospital had an older age profile than those returning to the community.

People whose final episode in hospital began with a change in care type or a hospital transfer were more likely to be admitted into RAC following discharge than people with a final episode which began with admission from outside the hospital system (Table E.1). For example, if the discharge episode for our reference person had begun with a transfer between hospitals rather than with entry into the hospital system, her predicted probability of discharge to RAC would be 1.5 times higher (0.6% versus 0.4%), while if it had begun with a change in care type the predicted probability would be 2.4 times greater (0.9%).

Care type in hospital prior to discharge was associated with the likelihood of entering RAC from hospital (Table E.1). People who received palliative care, maintenance care or other/unknown care prior to discharge were more likely to be admitted to RAC than people who received acute care prior to discharge. On the other hand, people receiving rehabilitation care were less likely than those receiving acute care to be admitted to RAC. Consequently, our reference person, who had received acute care prior to discharge, has a 0.4% predicted probability of entering permanent RAC, compared with 1.1% for an adjusted reference person receiving palliative care and 0.6% for someone receiving maintenance or other/unknown care. People receiving rehabilitation care prior to discharge were nearly half as likely to be admitted to RAC as people receiving acute care (see also Table 3.16).

The probability of admission to RAC also varied with state or territory of hospital admission (Table E.1). For example, our reference person using a hospital in New South Wales or South Australia has the highest predicted probability of being admitted into RAC (0.4%) when compared with her counterparts in hospitals in Victoria (0.3%) and the other states and territories (0.2%). This result suggests that jurisdictional differences in care services provision and/or practices could be affecting post-hospital destination.

Whether or not a person has a partner provides an indication of the availability of care at home on return from hospital (although, for older people, partners themselves may need assistance). People who were married or in a de facto relationship were less likely than other people to be admitted to RAC (Table E.1), with people who had never married being the most likely to be discharged to RAC (predicted probability of 0.7% for adjusted reference person).

People with the highest levels of English proficiency were more likely than others to be admitted to RAC (Table E.1). In particular, people born in countries in the lowest EP group (EP 4) have the lowest predicted probability of RAC admission (0.2% for adjusted reference person).

5.1.2 Discharge to permanent rather than respite RAC

An estimated 30,400 people aged 65 years and over moved into RAC from hospital (excluding returns to RAC) (Table 1.3). Of these, nearly three-quarters (72%) moved into permanent RAC.

When fitting Model B the most significant predictors of admission into permanent rather than respite RAC from hospital were:

- hospital care type prior to discharge
- the duration of the hospital episode before discharge
- principal diagnosis
- an additional diagnosis of 'Awaiting admission elsewhere'
- region of usual residence prior to hospital admission
- state or territory of hospital admission
- an additional diagnosis of dementia and related disorders.

Although important for the prediction of entry into RAC as opposed to return to the community, a patient's marital status, sex and EP group were not significant predictors of entry into permanent rather than respite RAC.

A summary of the main results from the logistic regression model is given below; details of Model B as fitted are given in Table E.2. As before, predicted probabilities based on a 'reference' person are used to aid the discussion, with the probability relating to being admitted into permanent rather than respite RAC. The characteristics chosen for the reference person, again selected because they were the most common, are given in Box 5.2. Someone with the same characteristics as the reference person has a predicted probability of 63% of entering permanent rather than respite residential care, compared with the observed rate of 72% across all admissions from hospital. As when discussing Model A, the effect of a particular variable on the predicted probability is illustrated by comparing the predicted probability for the reference person with that for an adjusted reference person, where the adjusted reference person differs from the reference person in only the single characteristic being discussed.

The probability of being admitted into permanent rather than respite care varied considerably with a person's circumstances. This can be seen by considering two people who differed from the reference person in several characteristics. For example, an 85 year old woman in hospital in Tasmania for a stroke who was in rehabilitative care for 10 weeks before being admitted into RAC was highly likely to have gone into permanent care, with a predicted probability of over 95% for being admitted into permanent rather than respite care. On the other hand, a 75 year old man living in an outer regional area prior to admission to a Queensland hospital because of a fall and who had 4 weeks in rehabilitative care prior to discharge to RAC was more likely to go into respite rather than permanent care, having a predicted probability of 34% for having a permanent RAC admission.

The results from Model B show that care type in hospital prior to discharge was associated with the likelihood of entering permanent RAC from hospital (Table E.2). People who received palliative care, GEM or maintenance care prior to discharge were more likely to enter permanent RAC than people who received acute care prior to discharge. Consequently, at 63% the reference person has a relatively low predicted probability of entering permanent RAC, compared with 71% for an adjusted reference person discharged from maintenance care, and 77% and 80% for adjusted reference persons discharged from GEM and palliative care, respectively. These higher probabilities reflect earlier results: GEM and palliative care both have higher ratios of permanent to respite admissions than acute care (Table 3.11).

Box 5.2: Reference person for comparison for Model B (discharge to permanent or respite RAC admission)

For this analysis the reference person has the following characteristics:

- *85 years old at admission*
- *female*
- *married/de facto*
- *born in Australia*
- *usual residence in a major city*
- *admitted to a hospital in New South Wales*
- *in a public hospital*
- *hospital admission was not a change in care type or transfer*
- *receiving acute care in hospital*
- *hospital episode duration of more than 1 week and less than 4 weeks*
- *a principal diagnosis of neoplasm.*

These values were chosen because in most cases within each variable they were the most common among people in the analysis.

Given that this reference person is being discharged to RAC, the predicted probability of them being admitted to permanent RAC from hospital is 62.5%. Hence, the predicted probability of this person being admitted into respite RAC is 37.5%. Details of how to calculate predicted probabilities of admission into permanent RAC for other combinations of variable values are given in Appendix E.

The longer a person's last hospital episode before RAC admission, the greater the likelihood was that he or she would be admitted to permanent RAC rather than respite RAC (Table E.2). For example, an adjusted reference person whose final hospital episode lasted for less than a week has a 50% predicted probability of entering permanent RAC and so is predicted to be just as likely to enter respite as permanent RAC. The predicted probability increases to 86% for an adjusted reference person who was discharged following a hospital episode lasting longer than 12 weeks. This result is as expected given that people admitted into permanent RAC had a median length of stay in hospital of 24 days compared with 14 days for people admitted into respite RAC (Table 3.13).

People with a principal diagnosis among stroke, dementia and related disorders or 'Awaiting admission elsewhere' have relatively high predicted probabilities of permanent RAC admission (adjusted reference person probabilities of 75%, 74% and 73%, respectively). Principal diagnoses for which people have relatively low predicted probabilities of permanent RAC admission (and therefore a relatively high probability of entering respite RAC) include injury caused by a fall (53% for adjusted reference person), other mental and behavioural disorders (excluding dementia and related disorders) (52%) and factors influencing health status (excluding 'Awaiting admission elsewhere') (48%).

A person with an additional diagnosis of 'awaiting admission elsewhere' had an increased probability of being admitted into permanent rather than respite RAC. For example, an adjusted reference person with this additional diagnosis has a 78% predicted probability of being admitted to permanent RAC compared with 63% for the reference person.

A person with an additional diagnosis of dementia and related disorders was more likely than someone without this diagnosis to be admitted into permanent RAC. Thus an adjusted reference person with this additional diagnosis has a 74% predicted probability of being admitted to permanent RAC.

A person living in an inner regional, outer regional or remote area before going to hospital was less likely to be admitted into permanent RAC than someone living in a major city prior to hospitalisation (Table E.2). As a result, the estimated probability drops from 63% to less than 50% for an adjusted reference person coming from an inner regional, outer regional or remote area.

State or territory of the hospital plays a significant role in predicting someone's admission into permanent RAC (Table E.2). For example, people discharged from a hospital in the Australian Capital Territory have the lowest predicted probability of being admitted into permanent RAC (45% for adjusted reference person), while people using Tasmanian hospitals have the highest (88%). This is consistent with the data regarding ratios of permanent to respite admissions presented in Table 2.3. These last two results indicate that variation in jurisdictional and regional aged care service provision and/or practices may influence the outcome.

5.2 Short-term use of residential aged care following a period in hospital

A question of particular interest from a policy perspective is what happens to people who enter RAC from hospital: do they remain in aged care or do they return to the community? If they return to the community, do they remain there, or are they re-admitted into RAC soon after? The answers to these questions provide information on whether RAC episodes following hospitalisation, particularly in respite care, are to aid recovery following hospitalisation or to facilitate a transition into permanent residential care.

To provide insight into these issues, transitions following a person's first move from hospital to RAC in 2001–02 were analysed using the following framework:

- People were said to have returned to the community if they did so within 12 weeks of their admission from hospital into RAC. A time of 12 weeks was used to set the cut-off because in general over 90% of respite stays are shorter than this (AIHW 2005:table A4.4). In addition, 12 weeks allows for one extension period following the initial approval for up to 63 days of residential respite care in a financial year (Box 1.2).
- If a person returned to the community within 12 weeks, a further assessment of the success of this move was made by seeing whether they returned to RAC within the following 4 weeks. Note that people may have died during the 4-week period but it was not possible to determine the number of such cases. In addition, some people also reported that they were moving to another aged care service yet were not identified in the ACCMIS data as having been re-admitted to any service within the 4 weeks.
- For people who did not return to the community within 12 weeks, their status at the 12-week mark was identified as:
  - being in respite RAC
  - being in permanent RAC

- discharged to hospital within the 12 weeks, or
- died in RAC within the 12 weeks.

Some examples of transition events are illustrated in Figure 5.1. Because a 16-week window was required to identify a successful return to the community, only hospital–RAC transition events occurring in the first 36 weeks of 2001–02 could be used to analyse returns and non-returns to the community.

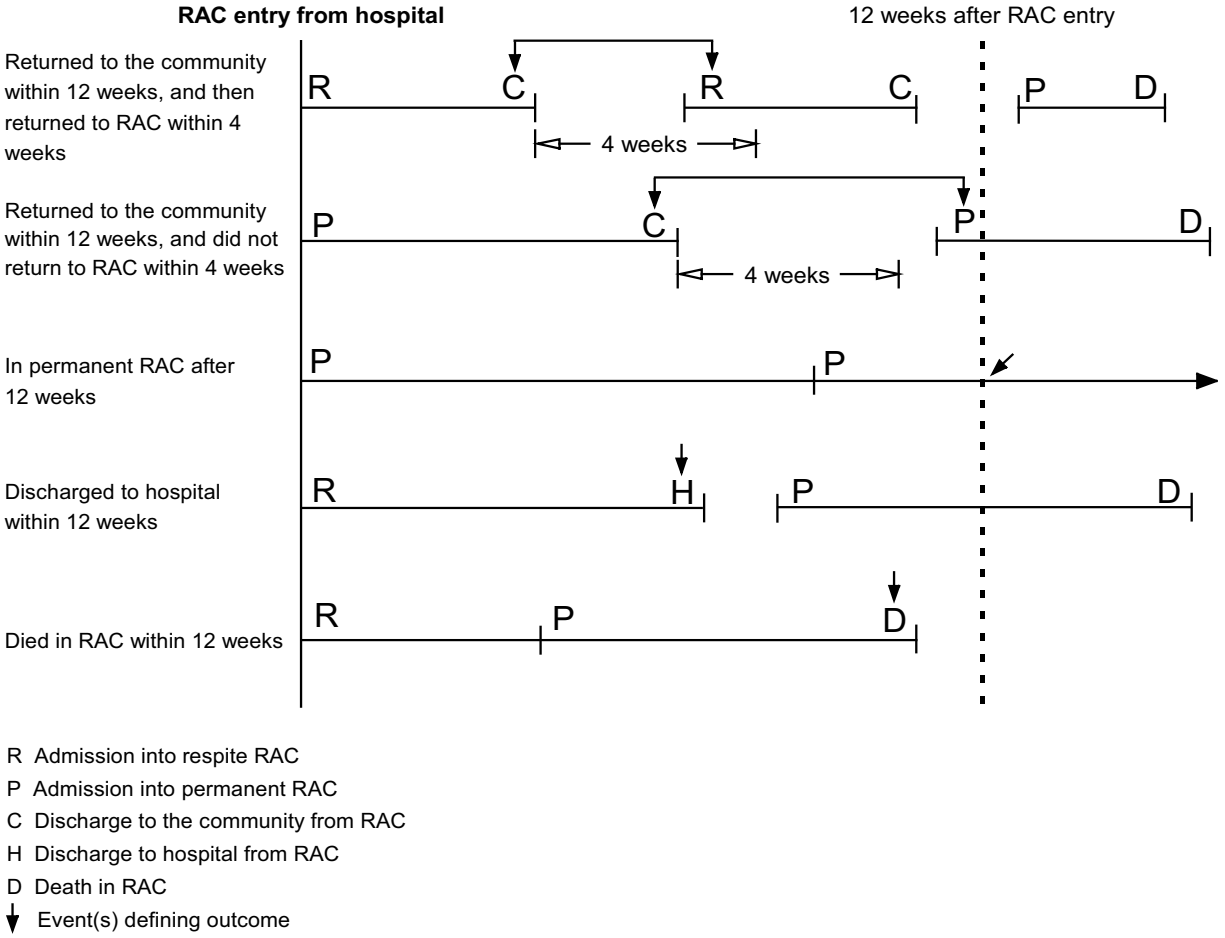


Figure 5.1: Short-term use of RAC: example pathways

5.2.1 Type of RAC admission

As expected, the situation of people 12 weeks after their admission to RAC from hospital differed according to whether they were admitted into respite or permanent care (Table 5.1, Figure 5.2). Over one-half (59%) of people who were admitted into respite care returned to the community within 12 weeks; 10% of this group (that is, 6% of all with respite admissions) were re-admitted into RAC within 4 weeks of returning to the community. Of those not re-admitted within 4 weeks, one-fifth (22%, or 11% of all respite admissions) left RAC reporting they were going to another RAC service but had not been re-admitted within 4 weeks of returning to the community.

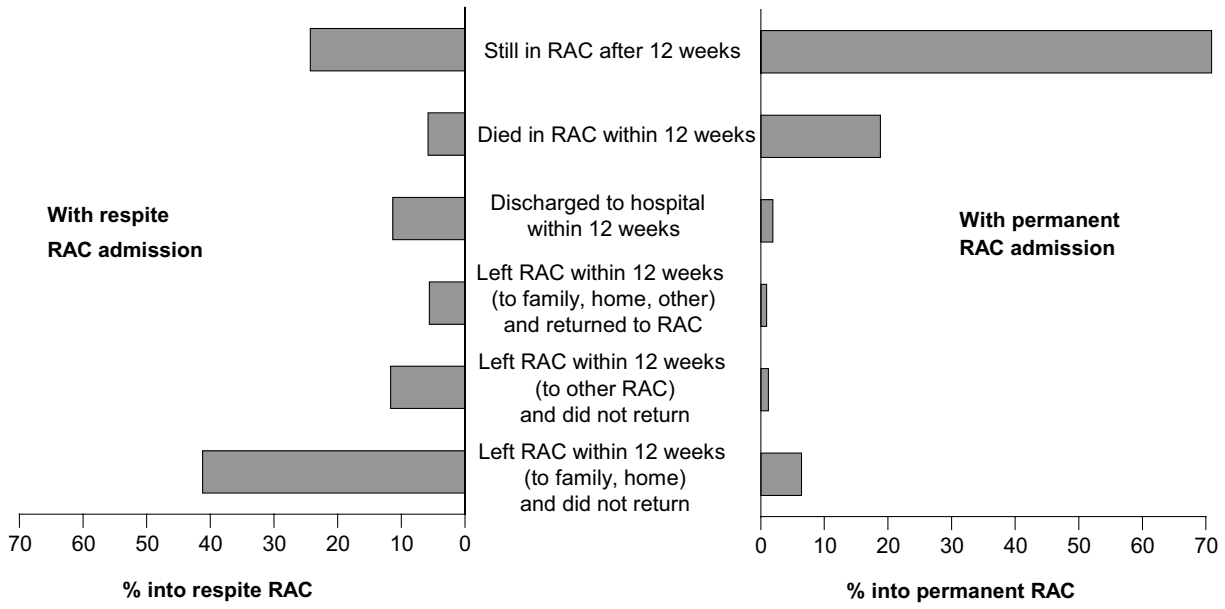
Just 9% of people who were admitted into permanent care returned to the community within 12 weeks, and about 11% of this group (129 of 1,190) were re-admitted into RAC within 4 weeks (Table 5.1). Around 14% of those who returned to the community within 12 weeks also reported they were going to another RAC service but had not been re-admitted within 4 weeks of returning to the community.

More than two-thirds (71%) of people admitted to permanent care were still living in RAC after 12 weeks, compared with 24% of people admitted to respite care (Table 5.1). In addition, 4% of this latter group (56 people) had transferred into permanent care within the 12 weeks. People admitted into respite care from hospital were less likely to die but more likely to be discharged to hospital within 12 weeks than those admitted into permanent care (6% versus 19% and 11% versus 2%, respectively; both differences statistically significant with $p<0.01$).

Of particular interest are the within-RAC transfer rates for people who were admitted to respite care from hospital and who were still in RAC after 12 weeks. Analysis of the RAC data has shown that among RAC admissions in 2001–02, the level of respite and permanent RAC non-transfer admissions were about equal (48% and 52%, respectively) (AIHW 2003c). In addition, approximately 20% of all respite admissions during 2001–02 subsequently resulted in a transfer to permanent care (unpublished AIHW analysis). However, Table 5.1 shows that among all respite admissions from hospital only 1% resulted in a transfer to permanent care within 12 weeks, and for those people entering RAC from hospital, far fewer people were admitted into respite care than permanent care (28% versus 72%, Table 5.1). That is, nearly three-quarters of people entering RAC from hospital were admitted into permanent RAC, compared with just over half for all non-transfer admissions. These differences suggest that people moving into respite care from hospital have different care needs and characteristics from people entering residential respite care from the community.

This tendency for people from hospital to be admitted into permanent rather than respite care is supported by data from the Aged Care Assessment Program Minimum Data Set annual report. Among 2003–04 assessments, clients were twice as likely to be recommended to permanent RAC if assessed in hospital than if assessed elsewhere (Aged Care Assessment Program National Data Repository 2005); that is, people were less likely to be assessed as having the capacity to return home when assessed in hospital. Whether this assessment is accurate is unknown, but it is possible that the deconditioning that can occur in hospital affects assessment outcomes (see references in AIHW: Karmel et al. 2007b).

The small percentage of people entering respite care who transferred to permanent care within 12 weeks (1%) and the high percentage returning to the community within 12 weeks (59%) suggests that, in 2001–02, for people leaving hospital respite RAC was being used at least to some extent as transition care before going back to the community. In addition, the relatively high proportion still in care at 12 weeks indicates that rehabilitative care can require long stays in respite care.



Source: Table 5.1.

Figure 5.2: Movement of people after admission to RAC from hospital, 2001–02

5.2.2 Regional differences

The pattern of returns to the community varied with state and territory (Table 5.1). The proportion of people with a post-hospital respite admission who returned to the community within 12 weeks ranged from 51% for South Australia to around 70% for Victoria and Tasmania. However, there was less variation in the proportion of these community returns with a re-admission into RAC within 4 weeks, with re-admission rates varying between 7% and 13% of community returns (excluding the Northern Territory). Rates of discharge to hospital and death while in respite care also varied with jurisdiction.

As seen previously, the proportion of admissions from hospital which were for permanent care fluctuated across the states and territories. Tasmania had the highest proportion of people moving into permanent rather than respite care: 89% compared with 56% for the Australian Capital Territory. However, there was less variation across the jurisdictions in the proportion of people returning to the community after permanent admissions than there was after respite admissions. After permanent admission from hospital, people returned to the community for between 7% and 12% of cases. Similar to respite admissions, and depending on the jurisdiction, re-admission into RAC within 4 weeks occurred for between 9% and 15% of those who had left, which in each case was about 1% of all people with a permanent admission. There was little variation in the proportion of permanent admissions ending with discharge to hospital. However, death in RAC within 12 weeks of permanent admission from hospital ranged from 16% in Victoria to 22% in South Australia (25% in the Australian Capital Territory, based on 93 cases). Overall, the proportion of people still in RAC 12 weeks after a permanent admission from hospital varied within four percentage points around 70% across all states and territories.

Differences in patterns of return to the community were more marked between jurisdictions than between remoteness regions (tables 5.1 and 5.2). The most striking difference was the decreasing relative use of permanent admissions as the remoteness of the RAC facility increased: for facilities in major cities 75% of people admitted from hospital went into permanent care compared with under 50% for those in remote and very remote regions (see also Table 2.6). On the other hand, the proportion of people who returned to the community within 12 weeks of being admitted to respite care from hospital was relatively low for facilities in remote and very remote areas (53% compared to 59% overall). The models on discharge into RAC discussed in Section 5.1 also pointed to this pattern, showing that people from more remote regions were less likely than others to be discharged into RAC, and that the resulting admission into care was even less likely to be for permanent RAC as remoteness increased. This pattern could result from a number of factors, including the availability of residential care in a person's local region, the availability of community care and the need to ensure that a person can cope once they return to a home that may be a long way from emergency services.

Table 5.1: People aged 65+ returning to the community following RAC admission from hospital, by admission type and state/territory of usual residence, 2001–02 (unadjusted)

Admission type/movement following admission to RAC	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	All	N
Transition into respite RAC					Column per cent					
Returned to the community within 12 weeks										
Did not return to RAC within 4 weeks										
Left reported going to RAC	14.5	9.1	8.0	14.1	10.2	n.p.	9.5	n.p.	11.7	633
Other	37.7	53.1	42.7	38.3	35.7	n.p.	51.4	n.p.	41.2	2,238
Subtotal	*52.2*	*62.2*	*50.7*	*52.4*	*45.9*	*>58.1*	*60.8*	*n.p.*	*52.9*	*2,871*
Returned to RAC within 4 weeks										
Readmission into respite RAC	3.4	7.1	5.9	4.2	3.9	n.p.	n.p.	n.p.	4.7	253
Readmission into permanent RAC	0.9	1.3	1.4	—	0.7	n.p.	n.p.	n.p.	1.0	52
Subtotal	*4.3*	*8.3*	*7.4*	*4.2*	*4.6*	*<11.6*	*6.8*	*n.p.*	*5.6*	*305*
Total returners to the community	*56.4*	*70.5*	*58.0*	*56.6*	*50.5*	*69.8*	*67.6*	*>64.3*	*58.5*	*3,176*
Did not return to the community										
In respite RAC after 12 weeks	26.1	15.1	18.9	26.9	28.6	23.3	18.9	n.p.	23.3	1,264
In permanent RAC after 12 weeks	1.1	0.9	1.0	1.1	1.2	—	—	n.p.	1.0	56
Discharged to hospital within 12 weeks	11.0	9.0	15.2	11.2	10.7	n.p.	n.p.	n.p.	11.3	615
Died in RAC within 12 weeks	5.4	4.4	6.8	4.2	9.0	n.p.	n.p.	n.p.	5.8	316
Total non-returners to the community	*43.6*	*29.5*	*42.0*	*43.4*	*49.5*	*30.2*	*32.4*	*<35.7*	*41.5*	*2,251*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**. .**
Total (people)	**2,274**	**865**	**993**	**475**	**689**	**43**	**74**	**14**	**. .**	**5,427**
Transition into permanent RAC										
Returned to the community within 12 weeks										
Did not return to RAC within 4 weeks										
Left reported going to RAC	2.0	0.8	0.6	0.8	0.6	n.p.	n.p.	n.p.	1.2	163
Other	6.2	6.6	6.5	6.1	5.8	n.p.	n.p.	n.p.	6.4	898
Subtotal	*8.2*	*7.4*	*7.1*	*6.9*	*6.4*	*>10.7*	*7.5*	*n.p.*	*7.6*	*1,061*
Returned to RAC within 4 weeks										
Readmission into respite RAC	—	—	—	—	—	n.p.	—	n.p.	—	—
Readmission into permanent RAC	0.8	0.7	1.3	1.2	0.8	n.p.	—	n.p.	0.9	129
Subtotal	*0.8*	*0.7*	*1.3*	*1.2*	*0.8*	*<1.4*	*—*	*n.p.*	*0.9*	*129*
Total returners to the community	*9.0*	*8.1*	*8.4*	*8.1*	*7.3*	*12.1*	*7.5*	*n.p.*	*8.5*	*1,190*
Did not return to the community within 12 weeks										
In respite RAC after 12 weeks	—	—	—	—	—	—	—	n.p.	—	—
In permanent RAC after 12 weeks	67.6	74.4	72.3	72.4	69.2	70.2	66.7	n.p.	70.9	9,897
Discharged to hospital within 12 weeks	1.8	1.7	2.0	3.0	1.4	<1.4	<5.4	n.p.	1.9	260
Died in RAC within 12 weeks	21.5	15.7	17.2	16.4	22.1	>16.2	>20.4	n.p.	18.8	2,621
Total non-returners to the community	*91.0*	*91.9*	*91.6*	*91.9*	*92.7*	*87.9*	*92.5*	*n.p.*	*91.5*	*12,788*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**. .**
Total (people)	**4,955**	**3,853**	**2,393**	**997**	**1,321**	**346**	**93**	**10**	**. .**	**13,968**
Per cent transitions into permanent RAC (% people with transition)	**68.5**	**81.7**	**70.7**	**67.7**	**65.7**	**88.9**	**55.7**	**41.7**	**. .**	**72.0**

Notes

1. Table is based on linked and unlinked hospital and RAC records. See notes to Table 1.3 for information on identification of transition groups; see Box 2.1 concerning interpretation of unadjusted numbers.
2. Age is as at time of initial RAC admission from hospital.
3. Table is based on first admission from hospital during the first 36 weeks of 2001–02 to allow a 12-week window to identify returns to the community followed by a 4-week window to identify unsuccessful returns.

Table 5.2: People aged 65+ returning to the community following RAC admission from hospital, by admission type and region of RAC facility, 2001–02 (unadjusted)

Admission type/Movement following admission to RAC	Major cities	Inner regional	Outer regional	Remote and very remote	Australia	N
Transition into respite RAC			**Column per cent**			
Returned to the community within 12 weeks						
Did not return to RAC within 4 weeks						
Left reported going to RAC	12.4	9.1	13.8	11.4	11.7	633
Other	42.0	40.7	39.5	36.4	41.2	2,237
Subtotal	*54.4*	*49.8*	*53.3*	*47.7*	*52.9*	2,870
Returned to RAC within 4 weeks						
Readmission into respite RAC	3.9	6.4	4.7	n.p.	4.7	253
Readmission into permanent RAC	0.7	1.5	0.9	n.p.	1.0	52
Subtotal	*4.6*	*7.8*	*5.6*	*5.7*	*5.6*	*305*
Total returners to the community	*59.0*	*57.6*	*58.9*	*53.4*	*58.5*	*3,175*
Did not return to the community within 12 weeks						
In respite RAC after 12 weeks	24.0	22.1	21.4	31.8	23.3	1,263
In permanent RAC after 12 weeks	1.1	0.8	1.5	—	1.0	56
Discharged to hospital within 12 weeks	10.7	13.2	11.3	6.8	11.3	615
Died in RAC within 12 weeks	5.3	6.3	7.0	8.0	5.8	316
Total non-returners to the community	*41.0*	*42.4*	*41.1*	*46.6*	*41.5*	*2,250*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**. .**
Total (people)	**3,220**	**1,443**	**674**	**88**	**. .**	**5,425**
Transition into permanent RAC						
Returned to the community within 12 weeks						
Did not return to RAC within 4 weeks						
Left reported going to RAC	1.2	1.0	1.2	n.p.	1.2	163
Other	6.3	7.4	5.6	n.p.	6.4	898
Subtotal	*7.5*	*8.4*	*6.8*	*n.p.*	*7.6*	*1,061*
Returned to RAC within 4 weeks						
Readmission into respite RAC	—	—	—	—	—	—
Readmission into permanent RAC	0.8	1.2	1.1	n.p.	0.9	129
Subtotal	*0.8*	*1.2*	*1.1*	*n.p.*	*0.9*	*129*
Total returners to the community	*8.3*	*9.6*	*7.9*	*<5.7*	*8.5*	*1,190*
Did not return to the community within 12 weeks						
In respite RAC after 12 weeks	—	—	—	—	—	—
In permanent RAC after 12 weeks	70.7	71.2	71.0	82.0	70.9	9,896
Discharged to hospital within 12 weeks	2.0	1.3	2.2	n.p.	1.9	260
Died in RAC within 12 weeks	19.0	17.9	19.0	n.p.	18.8	2,621
Total non-returners to the community	*91.7*	*90.4*	*92.1*	*>94.3*	*91.5*	*12,777*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**. .**
Total (people)	**9,866**	**3,024**	**1,016**	**61**	**. .**	**13,967**
Per cent transitions into permanent RAC (% people with transition)	**75.4**	**67.7**	**60.1**	**40.9**	**. .**	**72.0**

Notes

1. Table is based on linked and unlinked hospital and RAC records. See notes to Table 1.3 for information on identification of transition groups; see Box 2.1 concerning interpretation of unadjusted numbers.
2. Age is as at time of initial RAC admission from hospital.
3. Table is based on first admission from hospital during the first 36 weeks of 2001–02 to allow a 12-week window to identify returns to the community followed by a 4-week window to identify unsuccessful returns.
4. The table uses the Australian Standard Geographical Classification Remoteness Structure as developed by the ABS.
5. Three records were excluded due to missing valid postcodes for remoteness coding.

5.2.3 Age and sex differences

While not large, there were some differences in patterns in returns to the community by sex and age (Table 5.3). The proportion of people admitted to respite care from hospital who returned to the community was very similar for men and women (58% and 59%, respectively). However, women were slightly less likely than men either to have been discharged to hospital or to have died while in care (11% versus 13% and 6% versus 7%, respectively). There were also some age differences evident, with older people being less likely to return to the community than younger people (57% for men aged 65–79 compared with 60% for men aged 80+, and 57% and 63%, respectively, for women in the two age groups).

For admissions into permanent care, there were only minor differences by sex and age in the proportions of admissions followed by a return to the community. However, while men were slightly more likely than women to return to the community within 12 weeks of a permanent admission from hospital (9.4% versus 8.5%, $p<0.01$), the women who returned to the community were more likely to be re-admitted to RAC within 4 weeks (14% of women who left were re-admitted compared with 7% of men). Women were less likely to die within 12 weeks of admission (16% of women versus 23% of men) and overall were more likely to still be in permanent RAC than men at the 12 week point (74% versus 65%).

5.2.4 Care needs

As seen before in Section 4.3, people admitted into respite care on average had lower care needs than those admitted into permanent care: 44% of people admitted into low care from hospital went into permanent care compared with 82% of those admitted into high care (Table 5.4). People admitted into respite care with low-care needs from hospital were much more likely to return to the community than those with high-care needs (68% versus 48% of admissions). In addition, those who returned to the community were less likely to return within 4 weeks (8% compared with 12%). Furthermore, those with low-care needs were less likely either to die while in care (9% compared with 14%) or to be discharged to hospital (3% versus 10%).

Among people admitted permanently into RAC from hospital, the rate of returning to the community was not significantly different for people with low- and high-care needs. The main difference between the outcomes for low and high-care residents was in the proportion dying within 12 weeks: 21% of people admitted from hospital with high-care needs died within 12 weeks compared with 6% of those for people admitted with low-care needs.

Table 5.3: People aged 65+ returning to the community following RAC admission from hospital, by age, sex and admission type, 2001–02 (unadjusted)

Admission type/movement following admission to RAC	Male			Female				
	65–79	80+	All	65–79	80+	All	All	N
Transition into respite RAC				**Column per cent**				
Returned to the community within 12 weeks								
Did not return to RAC within 4 weeks								
Left reported going to RAC	12.4	11.0	11.6	9.3	12.6	11.7	11.7	633
Other	42.2	40.5	41.2	47.7	38.7	41.3	41.2	2,238
Subtotal	*54.6*	*51.6*	*52.8*	*57.0*	*51.4*	*53.0*	*52.9*	*2,871*
Returned to RAC within 4 weeks								
Readmission into respite RAC	4.4	4.4	4.4	4.8	4.8	4.8	4.7	253
Readmission into permanent RAC	0.7	1.0	0.9	1.0	1.0	1.0	1.0	52
Subtotal	*5.1*	*5.5*	*5.3*	*5.8*	*5.8*	*5.8*	*5.6*	*305*
Total returns to the community	*59.7*	*57.0*	*58.1*	*62.9*	*57.1*	*58.8*	*58.5*	*3,176*
Did not return to the community within 12 weeks								
In respite RAC after 12 weeks	19.5	21.7	20.8	21.2	26.0	24.6	23.3	1,264
In permanent RAC after 12 weeks	1.0	1.3	1.2	0.8	1.0	0.9	1.0	56
Discharged to hospital within 12 weeks	12.9	12.3	12.6	10.0	10.9	10.7	11.3	615
Died in RAC within 12 weeks	6.9	7.6	7.3	5.1	5.0	5.0	5.8	316
Total non-returners to the community	*40.3*	*43.0*	*41.9*	*37.1*	*42.9*	*41.2*	*41.5*	*2,251*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**. .**
Total (people)	**766**	**1,150**	**1,916**	**996**	**2,515**	**3,511**	**. .**	**5,427**
Transition into permanent RAC				**Column per cent**				
Returned to the community within 12 weeks								
Did not return to RAC within 4 weeks								
Left reported going to RAC	1.5	1.1	1.2	1.1	1.1	1.1	1.2	163
Other	7.9	7.1	7.4	5.9	5.8	5.8	6.4	898
Subtotal	*9.5*	*8.2*	*8.7*	*7.0*	*6.9*	*6.9*	*7.6*	*1,061*
Returned to RAC within 4 weeks								
Readmission into respite RAC	—	—	—	—	—	—	—	—
Readmission into permanent RAC	0.9	0.6	0.7	1.4	0.9	1.0	0.9	129
Subtotal	*0.9*	*0.6*	*0.7*	*1.4*	*0.9*	*1.0*	*0.9*	*129*
Total returns to the community	*10.4*	*8.8*	*9.4*	*8.3*	*7.8*	*8.0*	*8.5*	*1,190*
Did not return to the community within 12 weeks								
In respite RAC after 12 weeks	—	—	—	—	—	—	—	—
In permanent RAC after 12 weeks	66.7	64.6	65.4	74.7	74.0	74.2	70.9	9,897
Discharged to hospital within 12 weeks	2.0	2.1	2.1	1.9	1.7	1.7	1.9	260
Died in RAC within 12 weeks	20.8	24.5	23.1	15.1	16.4	16.1	18.8	2,621
Total non-returners to the community	*89.6*	*91.2*	*90.6*	*91.7*	*92.2*	*92.0*	*91.5*	*12,788*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**. .**
Total (people)	**2,017**	**3,294**	**5,311**	**2,108**	**6,549**	**8,657**	**. .**	**13,968**
Per cent transitions into permanent RAC (% people with transition)	**72.5**	**74.1**	**73.5**	**67.9**	**72.3**	**71.1**	**. .**	**72.0**

Notes

1. Table is based on linked and unlinked hospital and RAC records. See notes to Table 1.3 for information on identification of transition groups; see Box 2.1 concerning interpretation of unadjusted numbers.
2. Age is as at time of initial RAC admission from hospital.
3. Table is based on first admission from hospital during the first 36 weeks of 2001–02 to allow a 12-week window to identify returns to the community followed by a 4-week window to identify unsuccessful returns.

Table 5.4: People aged 65+ returning to the community following RAC admission from hospital, by care level and admission type, 2001–02 (unadjusted)

Admission type/movement following admission to RAC	Transition into respite RAC			Transition into permanent RAC				
	Low care	High care	All	Low care	High care	All	All	N
Returned to the community within 12 weeks				**Column per cent**				
Did not return to RAC within 4 weeks								
Left reported going to RAC	14.5	8.6	11.7	1.2	1.2	1.2	4.1	796
Other	48.2	33.6	41.2	6.7	6.4	6.4	16.2	3,136
Subtotal	*62.6*	*42.2*	*52.9*	*7.8*	*7.5*	*7.6*	*20.3*	*3,932*
Returned to RAC within 4 weeks								
Re-admission into respite RAC	4.9	4.3	4.7	—	—	—	1.3	253
Re-admission into permanent RAC	0.6	1.4	1.0	1.2	0.9	0.9	0.9	181
Subtotal	*5.5*	*5.7*	*5.6*	*1.2*	*0.9*	*0.9*	*2.2*	*434*
Total returners to the community	*68.2*	*47.9*	*58.5*	*9.0*	*8.4*	*8.5*	*22.5*	*4,366*
Did not return to the community within 12 weeks								
In respite RAC after 12 weeks	20.1	26.8	23.3	—	—	—	6.5	1,264
In permanent RAC after 12 weeks	0.5	1.6	1.0	82.9	68.6	70.9	51.3	9,953
Discharged to hospital within 12 weeks	9.0	13.9	11.3	2.2	1.8	1.9	4.5	875
Died in RAC within 12 weeks	2.2	9.8	5.8	5.9	21.2	18.8	15.1	2,937
Total non-returners to the community	*31.8*	*52.1*	*41.5*	*91.0*	*91.6*	*91.5*	*77.5*	*15,029*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**. .**
Total (people)	**2,851**	**2,576**	**5,427**	**2,218**	**11,750**	**13,968**	**. .**	**19,395**
Per cent of care type	**56.2**	**18.0**	**. .**	**43.8**	**82.0**	**. .**	**. .**	**. .**

Notes

1. Table is based on linked and unlinked hospital and RAC records. See notes to Table 1.3 for information on identification of transition groups; see Box 2.1 concerning interpretation of unadjusted numbers.
2. Age is as at time of initial RAC admission from hospital.
3. Table is based on first admission from hospital during the first 36 weeks of 2001–02 to allow a 12-week window to identify returns to the community followed by a 4-week window to identify unsuccessful returns.

5.3 Survival of people admitted into permanent residential aged care

It is of interest to examine how long people survive once admitted to permanent care. The linked data provide the opportunity to estimate the time from entry into permanent RAC until death, taking into account whether they were admitted from hospital and, if so, the effect of various health conditions. For this study, this was done through a statistical technique called survival analysis which uses available variables to predict time to an event—in this case death following admission into permanent RAC.

A useful characteristic of survival models is their ability to include censored observations in the analysis. Censored observations occur when the event is not observed during the period studied, so that a minimum survival time is known for the individual but the final survival time is not. A capacity to deal with censored data was needed for this analysis because not all deaths were recorded in the RAC data. For example, in 2001–02, 6% discharges from permanent RAC (excluding transfers) were for people reported as going to hospital and 4% were for people reported as going to live in the community (AIHW 2003c:56).

To perform the survival analysis, Cox proportional hazards regression models were fitted to the linked data. Cox proportional hazards regression models estimate the effect of explanatory variables on time to death by estimating their effect on the *hazard ratio,* also known as the *relative risk* (see Appendix F). The *hazard ratio* compares the risk of someone with a particular characteristic dying within the next time period with the risk of someone with a different (reference) characteristic. For example, if being male has a hazard ratio of 1.3, it means that men are 30% more likely to die in the next time period than women.

One way to represent the results of survival analysis is by plotting the *survival distribution function*, which estimates the proportion of people who have not had the event (in this case, death) by a certain time. The average survival distribution function provides us with a population view of the survival times of people entering permanent RAC. This is estimated by fitting a hazard function to survival times without including any explanatory variables.

Two Cox proportional hazards regression models were fitted for people entering permanent RAC:

- Model C for all people moving into permanent RAC
- Model D for people entering permanent RAC from hospital.

Model C allows comparisons of survival times by whether the person was admitted from hospital or not. However, because data on health conditions were not available for people entering RAC from the community the effect of particular health conditions could not be examined via this model. Therefore, model D, which incorporates hospital-specific variables, was fitted to investigate the effect of health conditions on survival. In both cases, the models considered survival from the time of first admission into permanent RAC in the period of interest. Appendix F contains details of the models, including a complete list of variables used and results.

Date of death information came from ACCMIS and may not have been available (and therefore may have given rise to censored dates) for two reasons:

- Death outside RAC: date of death is only available from the RAC data if the person died while in RAC. Therefore if the person died elsewhere we do not have their date of death,

but have a date of their last discharge from RAC. This 'last seen' date is the censored date used in the survival analysis.

- Currency of date of death data: in the data for this study date of death within RAC was only known for people who had died before 30 June 2004. People in RAC who had not died by 30 June 2004 were therefore known to have been alive on 30 June 2004. For these people, 30 June 2004 was used as the censored date.

People who were admitted into permanent RAC between 1 July 2001 and 31 December 2001 were included in the analysis. Admissions resulting from a transfer from respite RAC to permanent RAC were included as admissions into permanent care, while those arising from transfers from permanent care in one RAC facility to permanent care in another were not.

5.3.1 All people entering permanent RAC

Overall, during 2001–02, there were an estimated 38,400 non-transfer admissions for people aged 65 and over into permanent RAC and 8,000 transfers from respite into permanent residential care (Table 1.3). During July–December 2001, a total of 23,089 people aged 65 years and over were identified as entering permanent RAC. Of these people 11,378 (49%) had a censored survival date as they had an unknown date of death. More than one-half (56%) of these people were known to be still living in RAC at the time of censoring (that is, were still in RAC on 30 June 2004), just over one-quarter (28%) had reportedly left to move to another RAC facility but were not subsequently identified as returning, 9% were recorded as returning to their home or family and 7% had been discharged to hospital.

From the average survival distribution function (Figure 5.3), we see that one-quarter of all people entering permanent RAC between 1 July 2001 and 31 December 2001 died within just over 7 months (225 days) of admission and one-half died within 2 years and 2 months (774 days). Two-fifths of people in the analysis were still alive after 3 years.

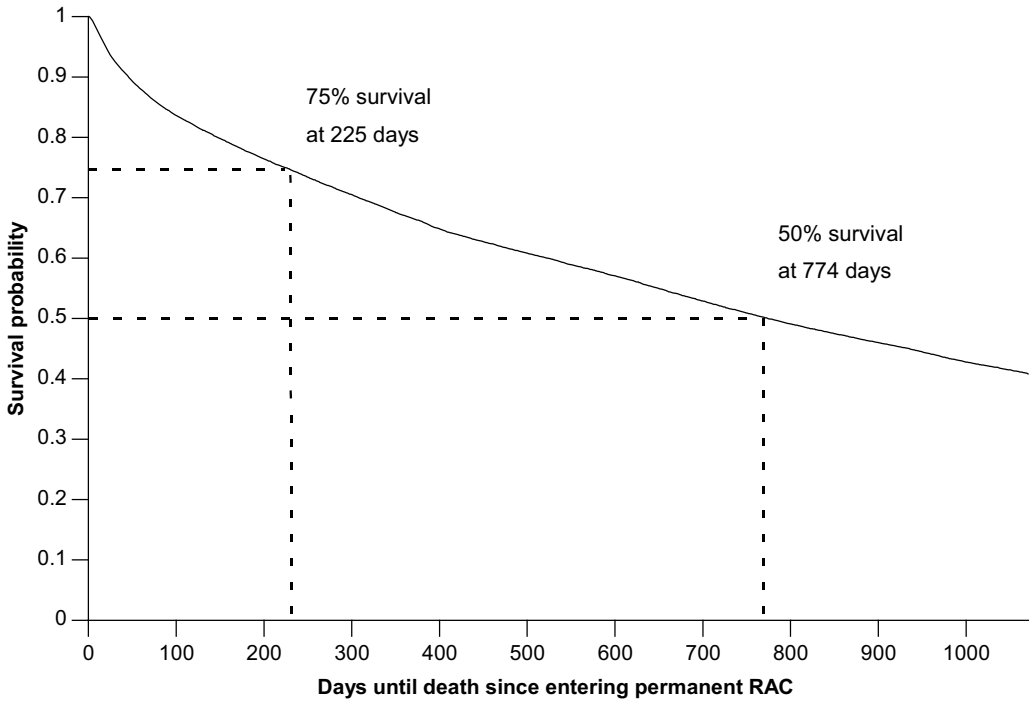


Figure 5.3: Average survival function for people entering permanent RAC during July–December 2001

Model C was fitted to identify factors associated with survival after entry into permanent care. Variables used in the model were sex, age at admission into RAC, marital status, state or territory of RAC admission, RCS category on admission (see Box 1.2), EP group, region of RAC facility, location of ACAT assessment, whether the person was admitted into RAC from hospital and whether the person had been in RAC before. Forward stepwise selection was used to enable identification of significant variables. Except for marital status, all of the variables were found to be significantly associated with survival time after admission into permanent RAC (Table F.1).

The effects of the variables included in the model can be seen by comparing estimated survival times following RAC admission. As with logistic regression, such comparisons are most easily understood with respect to a person with specific characteristics, or 'reference' person. Comparisons of survival times then relate to people with characteristics the same as those of the reference person except for the difference in the single variable whose effect is being considered.

The reference person for this analysis is described in Box 5.3; again common characteristics were used. Model C estimates that the reference person—an 85 year old woman born in an English speaking country, in the highest care needs category, and admitted from the community for the first time into a facility in a major city in New South Wales after an ACAT assessment in hospital—had a 75% chance of surviving at least 4 months (121) days and 50% likelihood of surviving at least 14 months (425) days following admission into permanent RAC. These survival times are considerably shorter than those observed across all people

entering permanent RAC (Figure 5.3). This is because the characteristics of the reference person overall result in a high relative risk of dying on any day.

Box 5.3: Reference person for comparison for survival analysis Model C (all persons to permanent RAC)

For this analysis the reference person has the following characteristics:

- *85 years old at admission*
- *female*
- *admitted to a RAC facility in New South Wales*
- *admitted to a RAC facility in a major city*
- *classified in RCS category 1 – the highest care needs category – on admission*
- *admitted to RAC from the community*
- *first time in RAC*
- *highest English proficiency level (Australian-born and EP1)*
- *ACAT assessment in hospital.*

These values were chosen because within each variable they were the most common among the people in the analysis. Marital status is not included as it did not contribute significantly to the model. Among people admitted to permanent RAC with these characteristics, Model C estimates that 75% survived at least 121 days and half survived at least 425 days.

The most significant variables for predicting survival time after RAC admission were RCS care needs category on admission, sex, age at RAC admission and whether the person was admitted into RAC from hospital.

As expected, having high care needs at the time of admission into permanent RAC were associated with an increased likelihood of death (Table F.1). Residents classified as RCS category 2 on admission were 22% less likely than residents classified as RCS category 1 to die on a given day (hazard ratio of 0.78), while RCS category 4 and category 5 residents were 56% and 66% less likely to die on a given day than RCS category 1 residents. Consequently, while it is estimated that the reference person—who is in RSC category 1—had a 25% chance of surviving at least 4 months (121 days) after admission, an adjusted reference person in RCS category 4 had a 25% chance of living at least 13 months (394 days). This estimated 75% survival time increased to 2 years and 7 months (944 days) for RCS category 7 (Figure 5.4a).

RAC residents who had a missing RCS category—particularly those who had received an ACAT approval for high-level care—were more likely to die than other residents (Table F.1). This finding reflects data collection practices: because RCS classifications may take several months to complete following admission into RAC, people with missing RCS categories are most likely those who died shortly after admission.

Men were 53% more likely than women to die on any day (Table F1, Figure 5.4c). For example, if the reference person were male, the model estimates that this person had a 50% chance of surviving 8 months (245 days) after admission into permanent RAC, compared with 14 months for the female reference person.

As would be expected, older age at admission into RAC was associated with an increased probability of death (Table F.1, Figure 5.4b). With each additional year of age, a person was

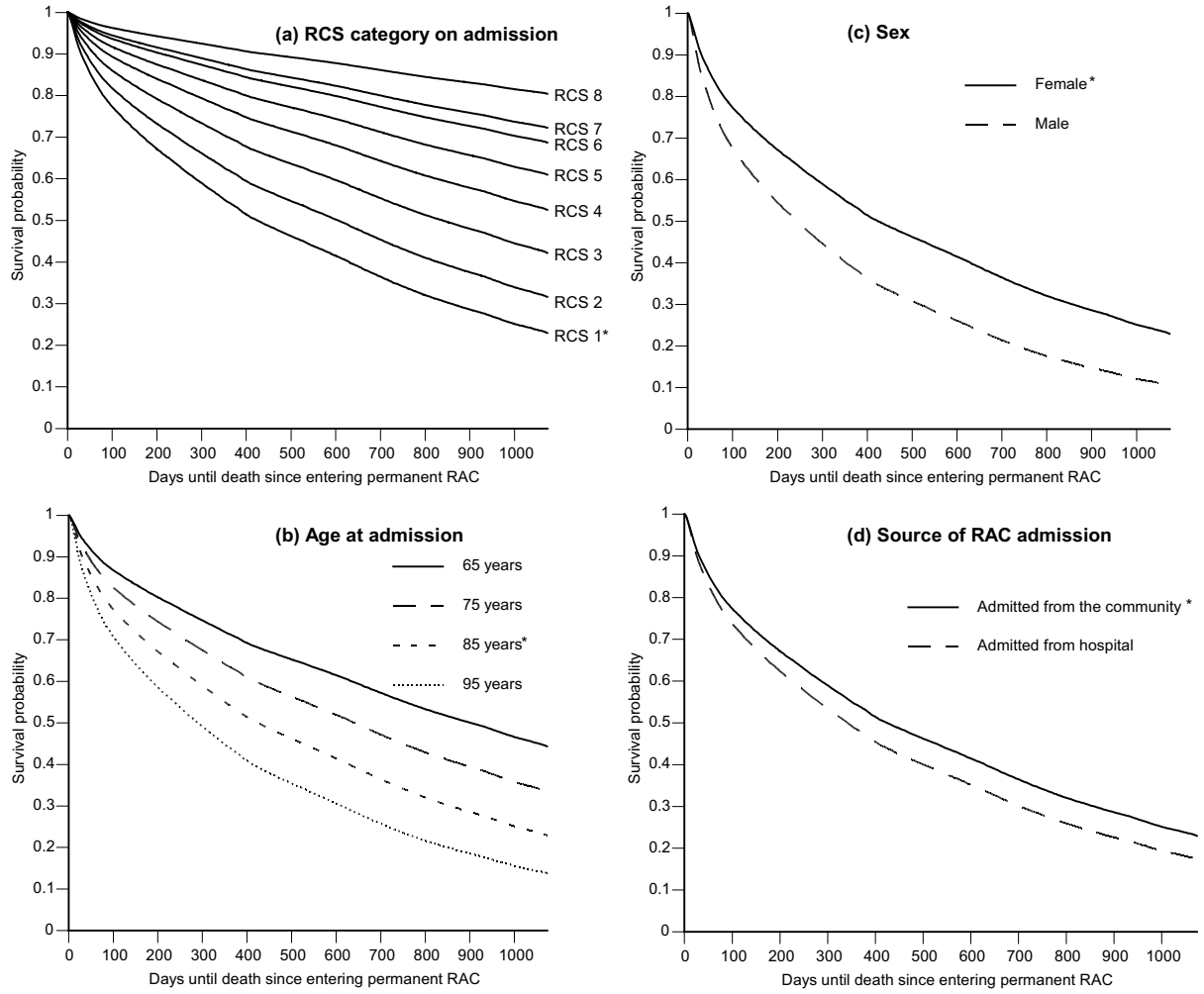
3% more likely to die on any given day. This equates to a 16% increase in the chance of dying with each 5 year increase in age. For example, in terms of survival times, an adjusted reference person admitted at age 65 had a 25% chance of surviving nearly 10 months (294 days) and 50% chance of surviving 2 years and 6 months (902 days) after admission. The comparable figures for someone admitted at age 95 were 11 weeks (76 days) and slightly under 10 months (290) days, respectively.

People admitted into RAC from hospital were 19% more likely to die on any day than those admitted from the community (Table F.1, Figure 5.4d). Thus, it is estimated that a person admitted from hospital had a 25% chance of dying within 3 months (92 days) after admission and 50% chance of dying within 11 months (342 days), compared with 4 months and 14 months, respectively, for the reference person admitted from the community.

Lower levels of English proficiency were associated with a lower probability of dying (Table F.1). People classified as being in EP groups 2, 3 and 4 were respectively 9%, 16% and 36% less likely to die on a given day than people born in Australia or another English-speaking country. Consequently, the estimated median survival time increased from 1 year and 2 months for the reference person (EP group 1) to 1 year and 4 months (490 days) for an adjusted reference person in EP group 2, and to 2 years and 3 months (761 days) for someone in EP group 4.

The location of a person's ACAT assessment was associated with survival time following admission to permanent RAC (Table F.1). There was no difference in likelihood of death between people assessed in hospital and in permanent RAC. However, people assessed in their own home, or in another setting (including with missing location) were 10% and 16% less likely, respectively, to die on a given day than people who were assessed in hospital. For example, an adjusted reference person assessed at home had a 50% chance of surviving nearly 1 year and 5 months (503 days); the corresponding figure for someone assessed in another setting (but not in hospital) or with a missing place of assessment was 1 year and 6 months (551 days)—just over 4 months longer than the reference person assessed in hospital.

People who were admitted into a RAC facility in an inner or outer regional area had a higher probability of dying on any day than those admitted into a RAC facility in a major city (8% and 13% more, respectively) (Table F.1). For example, the median survival time is estimated at 1 year and 3 weeks (386 days) for an adjusted reference person admitted to an inner regional RAC facility, and 1 year (364 days) for someone admitted to an outer regional RAC facility. This pattern may reflect the observed movement of people from remote and very remote regions into RAC facilities in less remote regions (Section 4.4). A reluctance of people to move away from their region of usual residence is suggested by the relatively low likelihood of people from remoter areas to be discharged from hospital into permanent RAC (Section 5.1.2). Such reluctance could mean that people who need to change region when they enter permanent RAC delay the move compared with those who remain in their region of usual residence, leading to shorter survival times. This hypothesis is supported by the low hazard ratios for the remote and very remote categories of the variable indicating region of RAC facility.



Note: Survival functions are based on reference person characteristics given in Box 5.3. Reference person is indicated by *.

Figure 5.4: Survival functions for people entering permanent RAC during July–December 2001, by RCS category, sex, age and source of admission, controlling for all other variables

5.3.2 People entering permanent RAC from hospital

An estimated 21,800 admissions into permanent RAC for people aged 65 and over were associated with discharge from hospital (Table 1.3). For the investigation into the association of particular health conditions with survival, a total of 13,185 people were identified as entering permanent RAC from hospital between 1 July and 31 December 2001. Of these people, 41% were either known to be alive at 30 June 2004 or had left RAC and not returned, and so had censored survival dates. Of the people with censored survival dates, nearly one-half (47%) were still living in RAC at the time of censoring, over one-quarter (29%) had been reported as going to another nursing home or hostel but had not been identified as subsequently re-entering RAC, while 7% had returned to their home or family and 7% had been discharged to hospital.

Overall, one-quarter of people admitted to permanent RAC from hospital between 1 July 2001 and 31 December 2001 died within 4 months (122 days) of entering RAC and a futher 25% died within the next 14 months (that is, within 542 days) (Figure 5.5). Less than one-third (31%) of people in the analysis were still alive after 3 years.

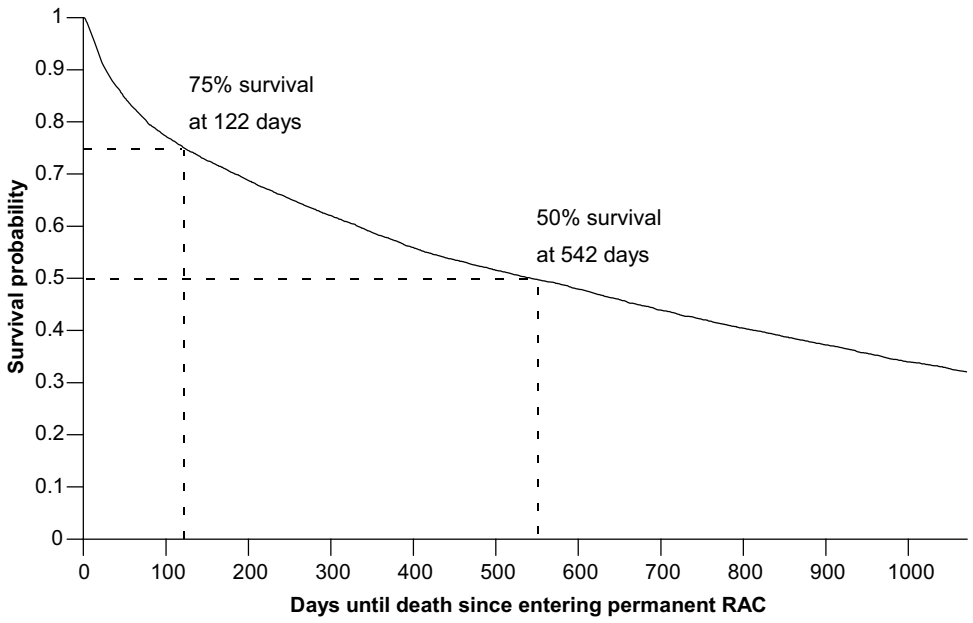


Figure 5.5: Average survival function for people entering permanent RAC from hospital during July–December 2001

Model D was fitted to identify factors associated with survival after entry into permanent care from hospital. Variables were entered into the model using a forward stepwise process. Explanatory variables included in the model were sex, age at RAC admission, marital status, EP group, state or territory of RAC admission, RCS category on admission, region of RAC facility, location of ACAT assessment, whether the person had been in RAC before, hospital sector (public/private), care type of hospital episode before discharge, length of hospital episode prior to discharge and a range of information on principal and additional diagnoses. Particular diagnoses were included in the modelling based on both their relevance to health priority areas and the number of people with the diagnosis (see Table C.1). Several of the variables were found to have no significant effect and were therefore excluded from the final model, including: marital status, EP group, location of ACAT assessment, whether the person had been in RAC before, hospital sector, number of hospital diagnoses and presence of certain medical conditions as an additional diagnosis (see Table F.2 for details of the final model). The state and territoriry and region variables also had no statistically significant effect but were included in the final model to control for variations in provision of RAC services.

A summary of the main results is below. The 'reference' person used to aid the discussion of this analysis is described in Box 5.4. The reference person for Model D is similar to that for Model C, with the addition of several hospital episode characteristics: the reference person was admitted from hospital after less than 1 week in acute care and had a principal diagnosis of stroke. Model D estimates that this reference person was more likely to die on any given day than the average person entering permanent RAC from hospital, having a 25% chance of dying within 3 months (95 days) and 50% chance of dying within a year (357 days) of admission into permanent RAC, compared with the population survival times of 4 and 18 months, respectively.

Box 5.4: Reference person for comparison for survival analysis Model D (persons to permanent RAC from hospital)

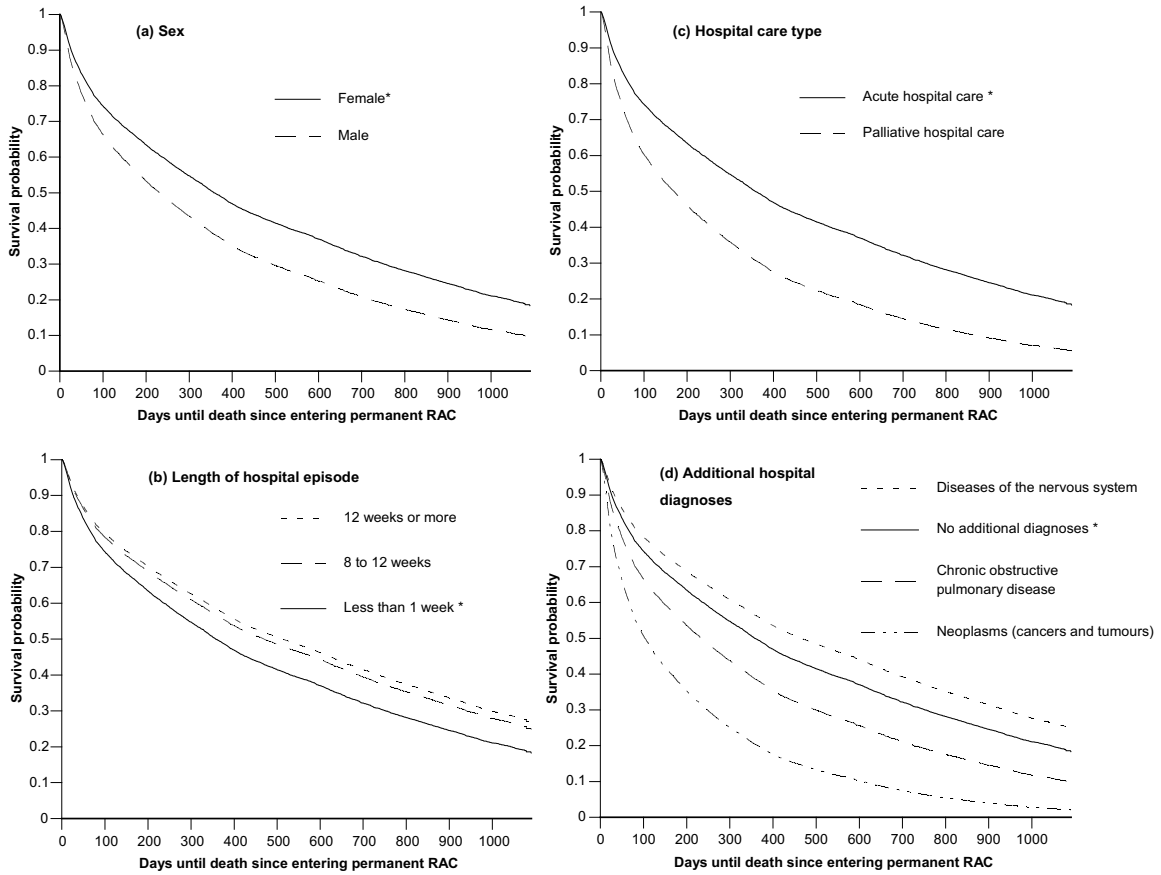
For this analysis the reference person has the following characteristics:

- *85 years old at admission*
- *female*
- *admitted to a RAC facility in New South Wales*
- *admitted to a RAC facility in a major city*
- *classified in RCS category 1 on admission*
- *hospital episode prior to admission to RAC was less than 1 week*
- *with a principal diagnosis of stroke*
- *care type in hospital before discharge was acute care*
- *no additional diagnoses in any of the 6 (out of 30 possible condition groups) found to have significant effects in the model (see Table F.2).*

These values were chosen because within each variable either they were the reference category in the model or they were the most common for people in the analysis – except for principal diagnosis for which stroke was chosen because it is a readily understood diagnosis with sufficient numbers for parameter estimation. Variables not included in the final model are not specified. Among people admitted to permanent RAC from hospital with these characteristics, Model D estimates that 75% survived at least 95 days and half survived at least 357 days.

As with Model C, the most significant variable for predicting survival time for people admitted from hospital was RCS category on admission. However, the principal diagnosis while in hospital was also influential, with other significant variables being the presence of certain additional diagnoses, age at admission, sex, and hospital care type and length of hospital episode before discharge.

While the effects of RCS category and age at admission were very similar to those seen for all people admitted to permanent care (Model C), the effect of sex was smaller. Men were 38% more likely to die on a given day than women (compared with 53% for Model C). Thus, while it is estimated that the reference person had a 50% likelihood of surviving almost 1 year after admission into RAC from hospital, an equivalent male had a 50% chance of dying within 8 months (231 days) (Table F.2, Figure 5.6a).



Note: Survival functions are based on reference person characteristics given in Box 5.4. Reference person is indicated by *, noting that the survival function by length of hospital episode is the same for all episodes under 8 weeks long.

Figure 5.6: Survival functions for people entering permanent RAC from hospital during July–December 2001, by sex, length of hospital episode, hospital care type and additional hospital diagnoses, controlling for all other variables

People with a principal diagnosis of neoplasm (cancer or tumour) had shorter survival times than others, with an adjusted reference person median survival time of just over 2 months (68 days) (Figure 5.7, Table 5.5). Only the uncommon principal diagnosis of cirrhosis and other diseases of the liver was associated with a similar probability of death. For other principal diagnoses, median survival times ranged from 4 months (120 days) for someone with chronic pulmonary obstructive disease (COPD) to just over 18 months (558 days) for someone with a principal diagnosis among mental and behavioural disorders excluding dementia (adjusted reference persons).

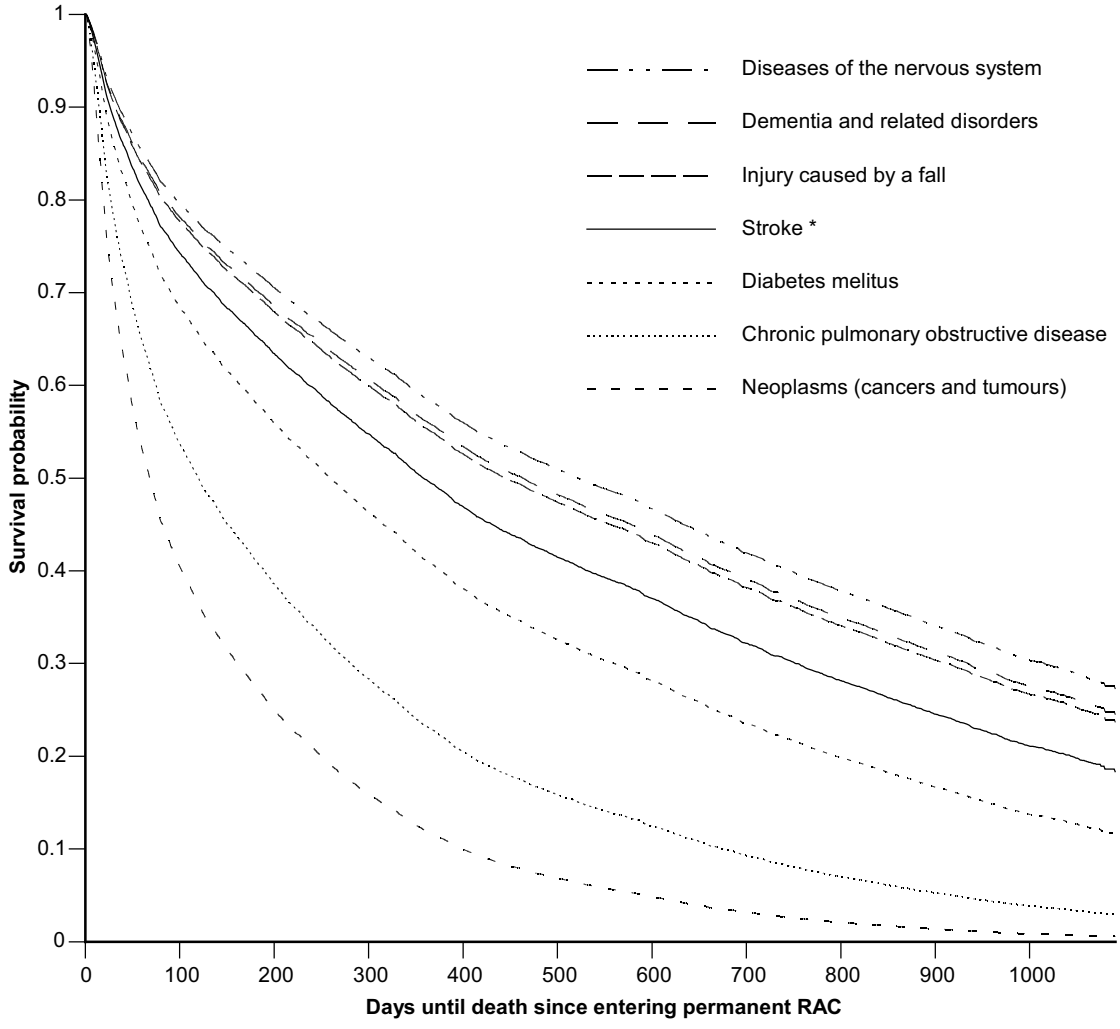
In addition to the principal diagnosis, comorbidities, as indicated by additional diagnoses reported for the hospital episode, were also associated with likelihood of death (Table F.2, Figure 5.6d):

- People with an additional diagnosis of neoplasm were more than twice as likely to die on any day as people without such a diagnosis.
- People with an additional diagnosis of kidney disease, COPD or a disease of the artieries were 30%–50% more likely to die on any day than people without such a diagnosis.

– Having an additional diagnosis among diseases of the nervous system was associated with an 18% decrease in the probability of death when compared with the absence of such a diagnosis.

Spending more than 8 weeks in hospital before being admitted into permanent RAC was associated with a decreased probability of dying (Table F.2, Figure 5.6b). Thus the estimated 50% survival time for an adjusted reference person who had an 8 to 12 week hospital episode before RAC admission was just over 15 months (470 days), compared with 1 year for the reference person who spent under 1 week in hospital before RAC admission. For hospital episodes longer than 12 weeks the median survival time following RAC admission was almost 17 months (514 days). Under 8 weeks, the length of the hospital episode before discharge to permanent RAC had no significant effect on likelihood of death.

People who were in palliative care in hospital were much more likely to die on a given day than people who were in acute care in hospital (Table F.2, Figure 5.6c). An adjusted reference person in palliative care before entering RAC had a 25% chance of dying within 7 weeks (46 days) and 50% chance of dying within 6 months (170 days), compared with 3 months and 1 year, respectively, for our reference person in acute care before RAC admission.



Note: Survival functions are based on reference person characteristics given in Box 5.4. Reference person is indicated by *.

Figure 5.7: Survival functions for people entering permanent RAC from hospital during July–December 2001, by selected principal diagnoses, controlling for all other variables

Table 5.5: Survival times for people entering RAC from hospital, by principal diagnosis (sorted by decreasing hazard ratio, derived using adjusted reference person)

Principal diagnosis	Estimated survival times[(a)]		
	75% still alive	50% still alive	25% still alive
		Days	
Neoplasms (cancers and tumours) (reference)	23	68	201
Diseases of the respiratory system: COPD	35	120	340
Diseases of the digestive system: cirrhosis and other diseases of the liver	35	119	337
Diseases of the genitourinary system: kidney failure	37	126	353
Diseases of the circulatory system (excluding stroke and other cerebrovascular disease, ischaemic heart disease and diseases of the arteries)	50	190	496
Endocrine, nutritional and metabolic diseases (excluding diabetes mellitus)	56	212	564
Diseases of the respiratory system (excluding COPD and influenza and pneumonia)	59	228	597
Diseases of the blood and blood-forming organs and immunological disorders	60	231	608
Diseases of the circulatory system: ischaemic heart disease	62	239	623
Endocrine, nutritional and metabolic diseases : diabetes mellitus	67	260	667
Diseases of the respiratory system: influenza and pneumonia	69	270	692
Diseases of the digestive system (excluding cirrhosis and other diseases of the liver)	72	279	709
Infectious and parasitic diseases	82	323	803
Diseases of the circulatory system: cerebrovascular disease (excl stroke)	84	328	811
Diseases of the circulatory system: stroke	95	357	888
Diseases of the circulatory system: diseases of the arteries	95	357	888
Symptoms, signs and abnormal findings n.e.c.	100	374	921
Diseases of the musculoskeletal system and connective tissue	102	383	936
Diseases of the skin and subcutaneous tissue	105	387	946
Factors influencing health status (excluding 'Awaiting admission elsewhere)	111	403	976
Diseases of the genitourinary system (excluding kidney failure)	112	407	985
Other (including diseases of the ear and eye)/unknown	113	407	986
Factors influencing health status: 'Awaiting admission elsewhere'	115	416	1,009
Injury, poisoning and other consequences of external causes (excluding injury caused by fall)	117	420	1,016
Injury, poisoning and other consequences of external causes: injury caused by fall	123	446	1,058
Mental and behavioural disorders: dementia and related disorders	129	464	1,078
Diseases of the nervous system	147	522	>1,090
Mental and behavioural disorders (excluding dementia and related disorders)	158	558	>1,090

(a) Survival functions are based on reference person characteristics given in Box 5.4.