



Institute of Actuaries of Australia

The Retirement Village Industry- Opportunities for Actuarial Improvement

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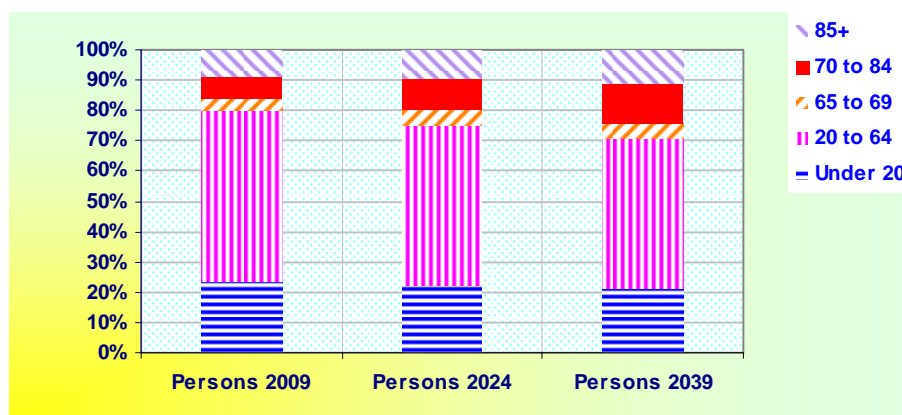
1 INTRODUCTION

1. Special purpose housing for the elderly falls into two groups – that for which care is of the essence of the offering and that where this is not the case. Where care is essential, the capital cost of facilities is generally met by the private or charitable sector and a significant proportion of the recurrent costs is met by the Government. Over the last thirty years, and particularly the last decade or so, there has grown an industry to cater for the accommodation needs of the well aged. This industry is the subject of this paper.
2. Resident funded retirement villages typically involve residents: -
 - a. paying to enter the village;
 - b. paying their share of the recurrent costs of running the village and
 - c. paying a deferred management fee (DMF) on vacation.
3. The amount of the DMF generally depends on the duration of occupancy and on the ingoing payment of the next resident. Demography and compound growth, the two foundations of actuarial thought, influence the value of the DMFs. This points to a leading role for the profession in the long term financial management of the retirement village industry.

2 MARKET

2.1 Gross Market

4. The market for the retirement village industry at its broadest is the population aged 55 or more excluding those too frail to care for themselves. A more realistic market would exclude most of the under 65 age cohort and perhaps even the 65 – 69 cohort. A further exclusion is the approximately 15%¹ of the age 65+ cohort who do not own their own homes.
5. The ABS 2004 population projection² shows the proportion of the population aged 65 to 84 will increase from 11.2% of the population to 17.9% over the thirty years to 2039. The following chart gives more detail.



2.2 Penetration

6. By any measure, the retirement villages industry's penetration of its potential market is modest.

7. A 2005 ABS survey³ in Western Australia found that 7% of people aged 55 or more lived in "a retirement village or group housing complex", but whether this definition includes only retirement villages relevant to this paper is unclear. The Retirement Villages Association (RVA) estimates around 145 to 150 thousand people or 5.25% of "seniors" live in retirement villages.

2.3 Future Growth

8. The growth of the industry will be founded on the growth of its target market and may be augmented by increased penetration of the market. However, there are longer term impediments to its growth. The impediments to growth include: -

- a. availability of sites;
- b. Government attitudes and
- c. community attitudes.

2.3.1 Site Availability

9. Many in the industry believe that retirement villages need to have more than 150 units to achieve economies of scale. This implies sites of at least 3 hectares. Aggregation of sites of this size in populated areas is difficult. Much of the "low hanging fruit" has already been picked.

10. Broad acre sites in country and city fringe locations have been developed, but not all people wish to move to completely different locations far from families and friends.

2.3.2 Government Attitudes

11. The attitudes and responses of different levels and branches of Government to retirement villages conflict somewhat and can overall be characterised as ambivalent.
12. At the State level, retirement villages can offer planning and infrastructure advantages. To the extent that aged people are occupying their old family home in a developed area, they are contributing to an underutilisation of the infrastructure that supports younger families. If these people can be housed in retirement villages, population density and diversity can be restored.
13. At the Federal level, there is a philosophical bent to keep the elderly in their own homes for as long as possible and a dislike of “elderly ghettos”. This obviously contains the cost of chronic care facilities. However, failing to recognise that retirement villages can be people’s homes too means the delivery of low level care is geographically spread and therefore more expensive than if elderly and mildly unwell people are concentrated in a retirement village.
14. The attitude of State Consumer Protection Departments has rarely been sympathetic to the retirement village industry. There have been good reasons for this attitude in a small number of cases in the past. This attitude means that marketing retirement village units is harder than selling any other housing option.
15. Local Governments bear the brunt of providing services to the well aged, although they receive financial assistance to provide some services. They also are closest to community discontent when a large facility is proposed in a neighbourhood.
16. Some local authorities have embraced resident funded retirement villages in direct competition with the private sector.

2.3.3 Community Attitudes

17. There is a view in the wider community that all accommodation for older people is “God’s waiting room”. This generates a reluctance for some well aged people to move into retirement villages. For them, movement to a retirement village is an acceptance of decline rather than a celebration of progress.
18. Residents are often hostile to establishment of retirement villages in their neighbourhoods. They fear that the increased density will be detrimental and they have concerns about traffic movement and parking. These fears are generally misplaced as retirement villages do not have the number of visitors that hospitals have and vehicle usage of their residents is often less than that of the wider community.

3 HISTORY

19. Government involvement in Australian resident funded retirement accommodation traces back to the influence of Keith Wilson, MHR for Sturt, on Dame Patti Menzies, wife of Prime Minister R G Menzies in the early 1950s. This led to the passage, in late 1954, of the Federal Aged or Disabled Persons Care Act 1954. In its original enactment, the Act provided

a £1 for £1 subsidy of the capital cost of accommodation of the aged or disabled. It also provided subsidies of recurrent funding of these facilities.

20. During debate on the bill the then Minister for Social Security, later prime minister, William McMahon commented that there were almost 200 charitable institutions providing housing for the elderly.⁴

21. A range of church, returned service, and community organisations took advantage of this legislation to shelter older Australians in quite basic “bed sitters”. There were also organisations specially formed to establish villages to house the less wealthy elderly.

22. The financial arrangements between residents and the institutions ranged from payment of rent through partially refundable capital donations to the payment of a non refundable capital donation. In 1967, Swan Cottages in suburban Perth reported that 123 of its 322 units were “*free of any {rent} contribution because of their capital gift for the unit.*”⁵

23. In 1974, the Commonwealth phased out its capital subsidies for retirement villages.

24. For profit involvement in the industry commenced in 1976 in Victoria with the family owned Australian Retirement Communities (ARC) (now part of the Stockland Group).

25. The ARC contract with residents involved: -

- a.** an interest free loan significantly less than the cost of land and construction and
- b.** repayment of the loan delayed eight years from the time of exit.

26. In New South Wales, private sector involvement commenced with the creation of Bay View Garden Village in suburban Sydney in 1978. The developer of Bay View Gardens village was a lawyer, Tony Baldwin, who noticed that his elderly clients (regardless of means) had no real alternative to the basic accommodation provided by Church and charitable organisations. Baldwin adapted the principles of the renowned “Arthur Murray” tax case and devised a lease that provided security of tenure for the residents and proper tax recognition of the lessor’s income.

27. The financial essence of the Baldwin contract was an interest free loan of 50% of the ingoing price with the remainder being pre paid rent of 2.5% of the ingoing per annum. On vacation, the manager repaid the loan and any unused rent. If occupancy ran beyond twenty years, the manager simply repaid the interest free loan.

28. The taxation treatment of the village income was that: -

- a.** deductions were available for the depreciation of the buildings;
- b.** the interest free loan was tax free and;
- c.** prepaid rent was treated as income as it was accrued.

29. An early listed participant in the industry was the Jennings group (now part of the Lend Lease group). In South Australia, the Cooperative Building Society (now Adelaide Bank) was an early participant. In Western Australia, the first private sector operator was St Ives Group, which created its first village in 1980.

30. From all of the private sector organisations mentioned came many of the past and present leaders of the industry.

4 PARTICIPANTS

31. Initially, resident funded retirement villages were the domain of the smaller developers and church and charitable institutions. Many of these participants developed multiple villages. The involvement of financial institutions and public companies was generally limited. Some corporate activity occurred towards the end of the 1980s, but the property market problems of the early 1990s aborted much of this. In the late 1990s and early this century, the involvement of financial institutions and listed companies accelerated.

32. By the middle of 2007, presentations for the Prime Retirement and Aged Care Trust revealed that about 26% of all independent living units in Australia were under management of eleven major industry participants⁶.

5 LEGISLATION

33. There is no uniform national retirement village regulation. The State legislation relating to retirement villages is: -

- | | | |
|-----------|--------------------|----------------------------------|
| a. | ACT | No specific legislation (a) |
| b. | NSW | Retirement Villages Act 1999 (b) |
| c. | Northern Territory | Retirement Villages Act 1995 |
| d. | Queensland | Retirement Villages Act 1999 |
| e. | South Australia | Retirement Villages Act 1987 |
| f. | Tasmania | Retirement Villages Act 1993 |
| g. | Victoria | Retirement Villages Act 1986 |
| h. | Western Australia | Retirement Villages Act 1992 |
- (a) Submissions concerning new Act closed 6 February 2009.
(b) New Act awaiting Royal Assent.

34. The following list of parts of the NSW 1999 Act indicates the scope of legislation in that jurisdiction.

1. Preliminary
2. Application Of Act
3. Representations And Information About Retirement Villages
4. Entry Into Retirement Villages
5. Village Contracts
6. General Management Of Retirement Villages
7. Financial Management Of Retirement Villages
8. Disputes
9. Termination Of Residence Contract
10. Matters Relating To Vacation Of Premises
11. Enforcement

- 12. Administration
- 13. Miscellaneous

35. Across the States, the thrust of the legislation is to provide consumer protection. As has been pointed out by industry leader Arthur Koumoukelis of Gaden's Lawyers, responsibility for retirement village legislation rests not with ministers for housing or ministers for seniors interests. It rests with ministers for consumer protection.

36. Of particular significance to actuaries are the sections of the various State's legislation that: -

- a. elevate the interests of residents over those of mortgagees who may come into possession of the land involved;
- b. require payment to vacating residents even if the unit involved has not been reoccupied and
- c. regulate retrospective changes to the manner of determining operating levies.

37. The consumer protection focus of the legislation means that the power of manager of a village to control its financial and general relationship with the residents is greatest at the time of drafting the underlying contracts. This drafting needs to contemplate the consequences of aging and decline, not only of residents, but also of buildings and equipment.

6 CONTRACTS WITH RESIDENTS

6.1 Types of Tenure

38. Residents occupy retirement village units on a variety of tenures including: -

- a. strata titles;
- b. company ("purple") titles;
- c. long term leaseholds (sometimes called "Loan and License").

39. Strata title tenure is unattractive to managers as it weakens their control of management rights. They argue that it is unsuitable for residents in that it exposes them to the "tyranny of the majority". In some strata title villages, facilities for frailer residents, such as therapy pools have been removed because the majority of residents do not wish to pay for their upkeep. Manager further argue that if they lose control in this tenure, they cannot ensure their marketing promises are kept. The obverse of the manager's lack of control is greater control for the residents. This, some residents would see as attractive.

40. Company title arrangements are rarely used now, due to complexities with compliance with the Corporations Law.

41. Leasehold tenure allows occupancy subject to the control of the village manager. This type of tenure provides residents with a degree of protection against the majority. It also ensures the continuation of the role of the village manager.

6.2 Financial Elements

42. Regardless of the type of tenure, the financial elements of the transactions between village managers and residents generally comprise: -

- a. standard recurrent costs;
- b. optional recurrent costs and
- c. capital transactions.

6.2.1 Recurrent Costs

43. Standard recurrent costs are generally closely controlled by the village documentation and have audit or approval processes to ensure that they break even or make a small specified profit. The heads of expenditure in the schedules of recurrent costs are similar to those one finds in strata title bodies corporate. They may include a sinking fund, but sometimes sinking funds are regarded as capital transactions.

44. Many villages offer care services on an ad hoc fee for service basis. These may be: -

- a. domestic services such as cleaning and laundry;
- b. meals in dining rooms;
- c. delivered meals or
- d. health and mobility related services such as assistance with showering and dressing of wounds.

45. These ad hoc services can be sources of profit.

6.2.2 Capital Transactions

46. The capital transactions of a retirement village generally involve: -

- a. an ingoing payment by the resident which may be less than the cost that would apply to an equivalent external unit and
- b. a payment to the outgoing resident, which is typically less than the amount paid by the next incoming resident.

47. The ingoing payment is generally described as a loan, but in the strata title situation, it is a conventional purchase price.

48. The outgoing payments are generally based on either the resident's ingoing payment ("purchase") or the ingoing payment of the subsequent resident ("reallocation"). The payment is generally reduced by amounts that relate to the duration of occupancy. These amounts are most frequently called DMFs, but other names including "Deferred Facilities Fee" also apply. The DMFs may be as much as 30% of reallocation price after periods as short as three or four years, but more often, the period is somewhat longer.

49. The majority of DMFs are reallocation price based, with a significant majority based on the purchase price.

50. DMFs are mostly linear with duration, which is variously rounded up or down or not rounded at all. They are almost uniformly truncated at between three and ten years, but some can continue to increase beyond ten years. In some cases, an initial retention is added to a linear basic DMF. In rare other cases, the DMF is not linear.

51. Sometimes when the final transaction is based on the purchase price, there is some sharing of “capital gain” and the outgoing resident receives a proportion of the excess of the reallocation price over the purchase price.

52. It is not unusual for a sinking fund contribution to be subtracted from the exit payment. This contribution is typically linear with duration but may be truncated. Since this sinking fund is not available to the manager, it is usual to exclude it from valuation calculations.

53. Where the tenure is strata title, the contracts oblige the outgoing resident to make payments to the village manager from the proceeds of the sale of the unit. In these cases, the ultimate net cash flow of the manager is the same as under a similarly structured lease agreement where the refund and the DMF are based on reallocation prices.

6.2.3 Other Features

54. Sometimes, contracts might provide financial concessions on movement to another level of care.

7 TAXATION

7.1 Income Tax

7.1.1 The Rulings

55. The two rulings that are significant to the taxation of retirement village operators are: -
- a. Ruling 94/24 which was issued on June 1994 and withdrawn 19 April 2000 and
 - b. Ruling 2002/14 which was issued as a draft 2000/D5 on 19 April 2000 and finalised on 28 June 2002.

7.1.2 Leasehold or License

56. The following table shows the taxation treatments that relate to leasehold villages.

	Pre 1994	1994	2002
Land	Not deductible	Deductible	Not deductible
Construction	Depreciable	Deductible	Depreciable
Interest paid	Deductible	Deductible	Deductible
Incoming resident's	Not assessable	Not assessable	Not assessable

	Pre 1994	1994	2002
payments			
Rental / DMF	Accrual	Receipt	Accrual / receipt (a)

- (a) Can vary between entities.

57. The following table shows the taxation treatments that relate to strata title villages.

	Pre 1994	1994	2002
Land	Deductible	Deductible	Deductible
Construction	Deductible	Deductible	Deductible
Interest paid	Deductible	Deductible	Deductible
Incoming resident's payments	Assessable	Assessable	Assessable
Rental / DMF	Accrual	Receipt	Accrual / receipt (a)

- (a) Can vary between entities.

7.2 Goods and Services Tax

58. Retirement village operations under lease arrangements are generally characterised as the provision of rental accommodation. As such, they are input taxed for GST purposes. GST is not paid on their core income and no GST refunds are available on core operations. In particular, DMFs are not subject to GST.

59. Non core operations such as hairdressing salons are subject to normal GST treatment.

60. The GST situation in strata tenure cases is that the first sale and DMFs are treated as a taxable supply and subject to GST, while all subsequent transactions are input taxed. Recurrent fees are treated as taxable supplies in these cases.

8 ACCOUNTING TREATMENT

61. This paper is concerned with the capital aspects of the finances of retirement villages. On this basis, the following discussion ignores the income that the manager may earn from optional or standard recurrent fees.

62. One could argue that the appropriate measure of the profit of a retirement village operator is the sum of DMFs received and the increase in the excess of the net present value of its financial assets over the net present value of its financial liabilities. In arguing this, one would have the support of AASB7, AASB132 and AASB139. However, the treatment approved by the four major auditing firms differs from this.

63. The auditor approved accounting treatment of villages is based on a balance sheet that includes: -

- a. as an asset, the expected present value of reversions of units to the manager and

- b.** as a liability, the nominal amount due to be paid to the resident accrued at balance date.
- 64.** The expected present value of reversions is influenced by: -
 - a.** the probability of exits;
 - b.** the discount rate assumed and
 - c.** the value increase rate assumed.
- 65.** Clearly, actuaries are well trained and suited to opine and use each of these three influences.

9 ACTUARIAL DEFINITION OF VALUATION

9.1 Essence of Calculation

- 66.** To an actuary, the valuation of the assets and liabilities of a retirement village operator is a familiar process based on standard life contingency processes applied to a multiple decrement table. The life contingency processes involved include: -
 - a.** increasing last survivor assurances used to value the DMFs and
 - b.** a constant last survivor assurance used to value the reversion of a vacant unit to the manager and the payments that must be made to the resident on vacation.
- 67.** These processes determine the value of all of the manager's contingent assets and liabilities. Sometimes it is necessary to use real discount rates and sometimes, nominal discount rates. Whichever is used, it remains true that these calculations are common actuarial functions. Nor does the fact that computers allow one to do the calculations in a way different from the commutation columns of old alter the actuarial profession's historic ownership of these techniques.
- 68.** The modes of decrement used in the creation of multiple decrement tables for these calculations can be divided into: -
 - a.** involuntary exits namely –
 - i.** death
 - ii.** transfer to a higher level of retirement village care and
 - iii.** transfer to aged care facilities and
 - b.** voluntary exits.

9.2 Differences From Familiar Practices

- 69.** The processes of valuing manager's interest in retirement villages depart from the actuarial familiarity in that: -
 - a.** the emphasis is often on the experience of the last survivor of a couple;
 - b.** units are re introduced to the calculations after exit and
 - c.** evidence of unit values is spasmodic.

70. Actuaries working in life insurance have some familiarity with last survivor assurances and those working with pensions have experience with last survivor annuities. In other areas, actuaries more usually deal with single lives. However, the step from single lives to last survivors is a small one.

71. In superannuation and life insurance, generally once a “valuation unit”, typically an individual life, exits an experience or valuation, it is no longer relevant to calculations. In contrast, in the retirement village context, a valuation unit, namely an individual residence, continues to contribute value even after the current residents have left.

72. It could perhaps be argued that the new entrants to a superannuation fund correspond to future occupants of a retirement village unit but, nevertheless, the retirement village situation differs from the situations more familiar to actuaries. This difference gives rise to the concept of what can be called “Total Value Factors” (TVFs) discussed below.

73. In the superannuation environment, salary growth is identified by examination of changes in individual and average salaries from year to year. In the retirement village context, value evidence only emerges when a unit is bought or sold. This difference is dealt with using the Case Shiller Index (CSI) discussed below.

9.2.1 Total Value Factors

74. The treatment of future entrants to an existing unit has a useful by product, the TVF. The TVF reflects the fact that the total value of the manager’s net cash flow from a unit is the net present value of the cash flow from the first occupancy, plus the present value of an assurance of the value from all future occupancies measured at the time of the next vacancy. The total value of the manager’s net cash flow is therefore the present value of all cash flows in respect of the unit in perpetuity. This value at any time comprises the value associated with the then current occupancy and all future occupancies.

75. The TVF is derived in the following way

Let

TVF_x be the value of a manager’s entire financial interest in a unit newly occupied for the x^{th} time by a “standard occupant” expressed as a proportion of the unit’s reallocation price;

V be the present value of the manager’s cash flows associated with the standard occupant (**excluding future occupants of the unit**) expressed as a multiple of the reallocation price and

A' be the present value of an assurance of \$1 adjusted for value inflation and reflective of the demographic assumptions payable on reoccupation **following** vacation of the unit

Then

$$TVF_x = V + A' * TVF_{x+1}$$

Since the TVF is the present value of payments in perpetuity, and assuming no change in the demographic or financial assumptions,

$$TVF_x = TVF_{x+1}$$

So one can dispense with the subscripts obtaining

$$TVF = V + A' * TVF$$

Hence

$$TVF = V / (1 - A')$$

76. The TVF expresses in a single figure: -
- a. the parameters of the contract between resident and manager;
 - b. the demographic assumptions namely –
 - i. age and sex / conjugal distribution of new residents and
 - ii. exit rates and
 - c. the financial assumptions namely –
 - i. the discount rate and
 - ii. the inflation rate (which may vary between cost and unit value inflation).

77. One can use changes in the TVF to identify the effects of changes in any of the above. One can also use it to determine the value of interests that created on “sale” of a unit.

78. The standard occupant referred to above is the weighted average of single females, single males and couples with the weights being the applicable proportions of each of these. The TVF can be calculated either using exit probabilities that are built from a weighted average life table or as the weighted average of the TVF appropriate to single females, single males or couples.

9.2.2 Case Shiller Index

79. One needs to examine the history of prices of units to form a judgement on the future rate of increase in value. While a reasonable number of units may be sold in any year in a village, individual units are sold and resold spasmodically. Moreover, individual units vary in value because of location and quality, so the use of aggregated sales data (eg growth = average sale price this year over average sale price last year) gives unreliable results. It is better to compare the change in price of individual units from one allocation to the next. This has its limitations, too, because it only gives the price change between two particular dates, and the range of dates varies widely between units.

80. The Case Shiller Index (CSI)⁷, which is used to track house prices in the USA, provides a meaningful measure of like for like growth. This method provides the least squares estimate of the logarithm of the index by solving for a_i in the equation

$$y_j = \sum a_i z_{ij}$$

Where $y_j = \text{Ln}(\text{Reallocation price/ Purchase price})$ for the j^{th} transaction pair and
 z_{ij} is a dummy variable set to
1 for the period of reallocation,
-1 for the period of purchase and
zero for all other periods

81. Where the sales examination relates to less than eighteen periods, the Microsoft Excel linear estimation function can be used to derive the CSI. For longer periods, one must use specialist statistical packages or calculations from first principles.

10 CURRENT VALUATION PRACTICE

82. Most valuations of retirement villages are performed by members of the Australian Property Institute (API). These valuations sometimes involve valuation of undeveloped land and aged care beds as well as manager's interest in currently built retirement village units. This paper is only concerned with the latter.

83. The API valuers tend to have proprietary models, which they are reluctant to discuss in detail. It is nevertheless possible to identify some deficiencies in their methods in some cases. These include: -

- a. use of global "turnover" rates rather than those reflecting the age, sex and conjugal specifics of individual residencies;
- b. use of national life expectancies without regard to the experience;
- c. failure to recognise voluntary exits;
- d. limited or no regard for last survivorship and
- e. assumptions that all turnovers will occur at the same duration.

84. If a village has predominantly relatively young residents, using the recently experienced crude turnover rates will understate future exits as the population ages and suffers higher mortality rates.

85. The evidence is that retirement village residents generally experience lighter mortality rates than those in national life tables. They have generally self selected on health and socioeconomic status. They also benefit from the informal care offered by managers and other residents. Even when one allows for other involuntary exits, overall exit rates tend to be less than the national mortality rates. Use of standard tables, therefore, tends to overstate exits and hence overstate values of managers' interests.

86. Residents leave retirement villages for reasons other than death or transfer to care. As shown below, the rate at which they do this varies widely across managers. It can also vary across villages. One needs to consider whether duration of occupancy or age of resident influences this. The nature of the contract can influence voluntary exit rates. A contract with

high DMFs can tend to lock residents in resulting in fewer voluntary exits than in a lower DMF village.

87. Often, the fact that financial transactions occur only on the exit of the last survivor is ignored. Sometimes, it is dealt with by basing calculations on the age of the female member of a couple.

88. Sometimes valuations assume that all exits occur at the same duration. This assumption creates a single DMF proportion, which can be misleading. If the maximum DMF applies after three years, assumption of, say 8 year occupancy may produce expected payments little different from those of individual calculations. If however, the DMF builds up to the maximum over a long period, the assumption could be problematic.

89. Use of a single duration creates distorted cash flows. This distortion is then reflected when one calculates the present values.

90. Actuaries are well aware that the exponential nature of discounting means the present value of an expectation is not the same as the expectation of a present value. Even if assuming a single exit duration, provides a reasonable approximation of the expected DMFs, it distorts the expected present value.

11 IDEAL VALUATION PRACTICE

91. Applying the standards used by the actuarial profession in other fields, one can identify the contents of an ideal valuation of a manager's interests in a retirement village. These would include: -

- a.** clear identification of the contractual provisions and manager's costs;
- b.** examination of the entry experience;
- c.** examination of the exit experience;
- d.** examination of the value growth experience;
- e.** setting and clearly describing the assumptions;
- f.** individual calculations of the value of interests in each unit;
- g.** discussion of the sensitivity of results to changes in assumptions;
- h.** reconciliation of the valuation result to those of the previous valuation and
- i.** discussion of the range and distribution of the value of the manager's interests.

11.1 Contractual Provisions and Manager's Costs

92. The documents establishing the relationship between residents and managers are often complex. The safest way to clearly identify the relationship is for the actuary to establish the parameters from the contract and then confirm them with the manager. The parameters include: -

- a.** the definition of duration (completed years, fraction of years or years commenced);

- b.** the basis of the DMFs (purchase or reallocation price);
 - c.** the existence of any time independent DMF;
 - d.** the commencement of DMF accrual;
 - e.** the rate of DMF accrual;
 - f.** the maximum DMF accrual;
 - g.** the responsibility for recurrent fees when a unit is vacated but not reoccupied;
 - h.** the responsibility for cleanup of the unit on vacation;
 - i.** the basic refund (before DMFs) to the resident;
 - j.** if appropriate, the share of capital gain paid to the resident and
 - k.** the existence of any concessional arrangements to transfer to another level of care.
- 93.** The manager may have some costs or receive some benefits not in the contract. These need to be discussed and quantified. They could include: -
- a.** an ongoing contribution by the manager to improvement and maintenance of the village beyond that provided by resident's recurrent fees;
 - b.** costs of refurbishment of vacated units not met from other sources;
 - c.** costs or income from selling vacated units and
 - d.** in respect of never occupied units, the costs of recurrent fees normally met by residents.

11.2 Entry Experience

- 94.** The entry experience provides the key to assumptions concerning new entrants and hence the TVF. The key variables are the average ages of entry of single and coupled people of each sex and the proportions thereof. These variables may differ: -
- a.** over time;
 - b.** by site or
 - c.** between initial and subsequent entrants.
- 95.** The records kept of entry dates are generally good. This is not surprising as the entry date is the essence of the financial transactions at exit. Dates of birth are also generally well recorded. This is perhaps due to the fact that entrants must be older than a minimum age.
- 96.** Managers sometimes hypothesise that the age of new entrants tends to increase as the existing residents age. They argue that the existence of older occupants deters younger residents or alternatively older entrants are attracted to villages with proportionately more people of their own age. Actuaries can easily test these assertions.
- 97.** Similarly, managers hypothesise that the proportion of couples amongst entrants falls over time. This can also be tested.

98. One often finds that villages located in “sea change” sites have younger and more married entrants.

99. A further hypothesis that can be advanced by managers is that the age and conjugal distribution of first entrants to a village is younger and more partnered than that of later entrants. This hypothesis can also be converted to a null hypothesis and tested.

11.3 Exit Experience

100. The examination of the exit experience uses familiar actuarial techniques. In this context, one can consider: -

- a.** whether it is useful to examine exits separately by type of exit or a global exit rate is acceptable;
- b.** whether a select period is appropriate;
- c.** whether exit rates are likely to be related to age and sex;
- d.** whether the rates are likely to be related to duration of occupancy and
- e.** whether the exit rates of individual members of a couple are independent.

101. One can divide exits into voluntary and involuntary exits. Voluntary exits occur when residents are unhappy in the village or for family reasons. Involuntary exits occur when a resident dies or has to move to a care facility. The reasons for both types of exit are obviously different and this counsels examining the experience separately for each type of exit.

102. Some villages keep better exit records than others do. Sometimes involuntary exits may be disguised as voluntary if villages do not know the true reasons for exits. Sometimes, the first exit of a member of a couple may not be recorded. Generally, however, professionally managed villages now maintain adequate records and this has been true for a reasonable time.

103. Self selection of entrants has two conflicting aspects: -

- a.** people are unlikely to make a lifestyle move to a retirement village (ie a “want” move) if their health is poor but
- b.** people who make the move to a retirement village on more of a “need” basis could be expected to have poorer health.

104. Determining whether selection exists may be complicated by the small numbers of people involved.

105. Involuntary exits are likely to be age and sex related. It can be useful to examine the experience by reference to standard life table mortality rates.

106. Voluntary exit rates could be sensitive to the duration of occupancy for two reasons: -

- a.** dissatisfaction often quickly becomes apparent and
- b.** the financial effect of DMFs means that people wishing to leave a village cannot find affordable alternative accommodation and therefore do not leave.

107. Involuntary exit rates amongst couples are not independent for the same reasons as they are not in elderly non retirement village couples. They are often exposed to the same risks of external trauma. The only circumstance in which one of a couple leaves voluntarily and the other stays is divorce. This tends to be rare in the retirement village population so voluntary exit rates of couples are clearly not independent.

108. In examining the exit experience, one also needs to be careful with the definition of the exit date. Some villages record the date of exit as the date of entry of the next occupant, rather than the actual date of exit.

11.4 Value Growth Experience

109. The growth in the value of units can be determined by using the CSI described above. The observed results need to be interpreted against the background that: -

- a.** values are influenced by housing values and
- b.** value growth can be influenced by the age of the village.

110. Retirement village units are homes and their value is influenced by the factors that influence home prices. For this reason, it is useful to isolate the effect of the general home price movements. This can be done, for example, by measuring the growth of units relative to the growth of median home prices in the catchment area.

111. Definition of the catchment area may be difficult. Even if this can be done, the setting of assumptions for future growth in the catchment area can be problematic. For this reason, it is often more convenient to measure unit growth relative to CPI.

112. The industry conventional wisdom of the chronological price cycle of a village is: -

- a.** very early sales occur at lower prices as the developer is anxious to start populating the village and the target market is the “early uptake” subset of the normal target market;
- b.** sale prices rise strongly after the “pioneers” have occupied the village and built a community aided by the marketing efforts of the developer;
- c.** once occupied, the rate of growth slows somewhat and
- d.** as the village ages, it is at risk of slower price growth if its maintenance has been lacking.

11.5 Assumptions

113. In this context, retirement villages are no different from any other field of actuarial endeavour. Assumptions need to be set, described and justified. In the retirement village case, the assumptions needed include: -

- a.** new entrant distributions;
- b.** exit rates;
- c.** discount rates;

- d. growth rates for values;
- e. growth rates for costs;
- f. taxation;
- g. vacation / reoccupancy delays;
- h. manager's holding costs;
- i. manager's sale costs and
- j. refurbishment costs.

11.6 Individual Calculations

114. In contrast to life insurance and superannuation work, it is difficult to value the manager's interests in a retirement village in age / sex groups. This is because: -

- a. of the problems of aggregating information that is dependent on duration and sometimes purchase price and
- b. the common existence of last survivor situations.

115. One can calculate present values for individuals using traditional actuarial techniques using commutation columns. However, clients often want to see cash flow projections. For this reason, it is common for the calculations to take the form of year by year projections.

116. These projections can show: -

- a. the amounts that would be paid or received if vacation occurred;
- b. the probability of vacation and hence
- c. the expected vacation cashflow leading to
- d. the present value of expected cashflow.

117. The reversion of interests from subsequent occupancies needs special treatment. It is also useful to identify the individual components of cashflow on vacation (such as DMFs, refurbishment costs, reversion of vacant units) and report separately on these components.

11.7 Sensitivity and Reconciliations

118. Sensitivity analyses in retirement village valuations are little different from those of other areas of actuarial endeavour. It is possible to produce an abbreviated sensitivity analysis by showing the sensitivity of the TVF to assumption changes. This reduces calculation time and gives a reasonable indication of the important variables.

119. Reconciliation of the valuation result to those of the previous valuation has many of the components of a traditional such reconciliation. By comparison with traditional work, it is complicated by the issues of duration and sole survivorship mentioned above.

11.8 Range and Distribution

120. Retirement village valuations are generally not predominately for solvency purposes. For this reason, there is less emphasis on the possible range and distribution of results. The easiest way to model the distribution and range of values is to simulate the experience of the village.

121. Simulations require the use of random numbers allocated to the probabilities: -

- a. of exit of each occupant each year;
- b. of the sex and conjugal distribution of new entrants;
- c. of the ages of new entrants and
- d. of value growth.

122. From multiple simulations, one can identify the distribution of values and then describe the corresponding probability distribution.

12 EXPERIENCE

123. This section presents some information about the experience of residents of villages owned by three village managers over the period 1994 to 2008. One manager's experience relates only to the period to 2006. The experience includes 698 new residencies and 4,822 person years of exposure during the period reviewed.

12.1 Exit rates

12.1.1 Death Rates

124. Over the whole experience, death rates expressed as proportion of Australian Life Table mortality expectations most recently published from time to time were as follows.

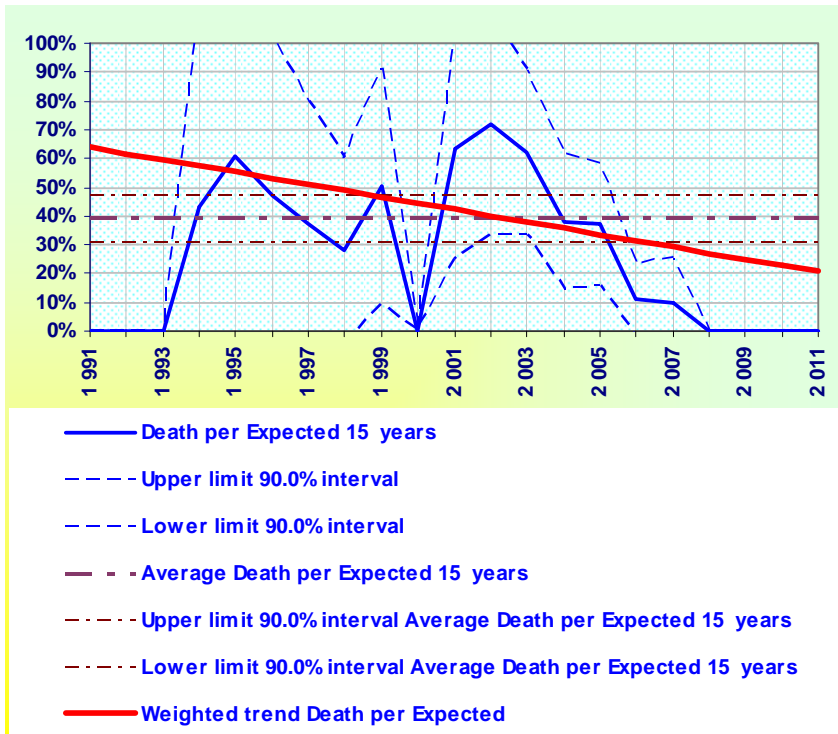
	Females	Males	People
Manager 1	37.6%	55.4%	44.4%
Manager 2	41.3%	54.2%	47.5%
Manager 3	27.2%	49.6%	38.2%
All managers	39.1%	53.9%	45.9%

125. The table illustrates that the rates vary across managers and sexes with only the latter being statistically significant.

126. The following chart shows how mortality rates as a proportion of the life table rates for females (the largest group) change over time. It shows: -

- a. mortality rates as a proportion of the standard rates in each year;
- b. the 90% confidence intervals attached to those rates;

- c. the average such rate experienced over the 15 year period of the investigation;
- d. the 90% confidence intervals attached to those rates and
- e. the least squares trend line weighted for the exposure in each year.



127. As indicated above, the trend line is weighted by the exposures at each year. The rates experienced each year are drawn from populations of different sizes. For this reason, the trend line is different from a trend line fitted to the plotted averages. This is true of all similar charts in this paper.

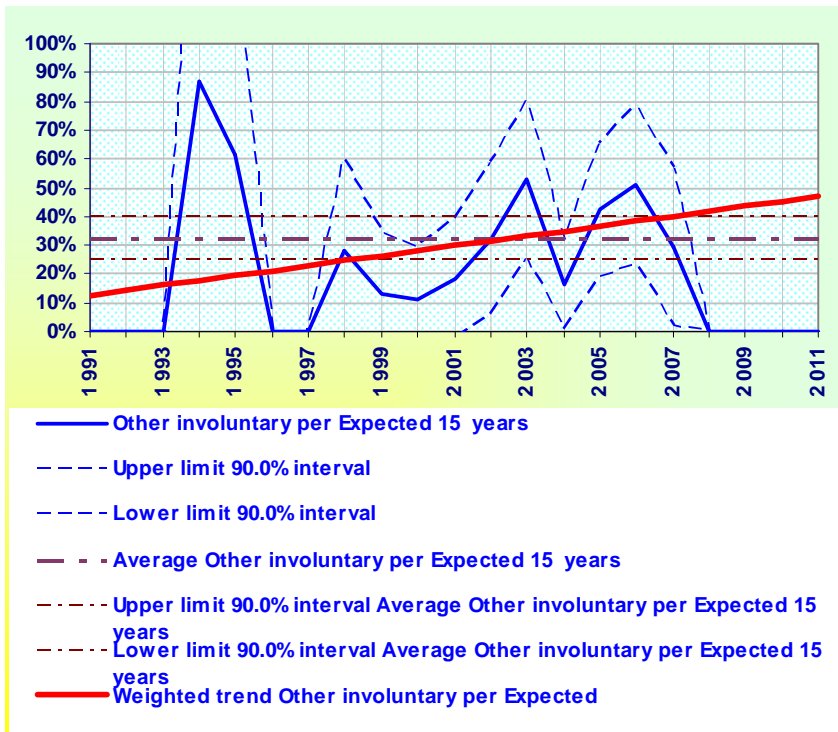
128. The wide confidence intervals on the rates in individual years counsel caution with the trend line. Because the rates are not normally distributed, usual regression analysis is not possible and one uses Chi² to test for trends. The downward trend in the preceding chart is not statistically significant, so one cannot, on the experience, reject the null hypothesis that the mortality rate as a proportion of the life table rate is constant over time.

129. Males experienced a less pronounced trend in the reverse (upward) direction in the ratio of deaths to those expected under the standard table. In combination, both sexes experienced a slight and not statistically significant downward trend.

130. Neither sex showed any marked relationship between deaths as a proportion of those expected under the standard tables and duration of occupancy.

12.1.2 Other Involuntary Exits

131. The chart above shows a female trend, albeit not statistically significant, towards decreasing mortality rates relative to population standard rates. The following chart shows that involuntary exit rates similarly measured experienced a reverse trend, which was also not statistically significant. One would not be surprised that decreasing deaths are associated with increasing involuntary exits as the latter remove less healthy lives from the exposure to death.



132. Males experienced a falling, but not statistically significant trend in other involuntary exits compared with those expected under the standard tables.

133. As was the case with deaths, there was no marked relationship between other involuntary exits compared with those expected and duration of occupancy.

134. The following table shows other involuntary exit rates expressed as proportion of Australian Life Table mortality expectations most recently published from time to time.

	Females	Males	People
Manager 1	26.4%	18.8%	23.5%
Manager 2	31.9%	20.5%	26.4%
Manager 3	48.8%	36.1%	42.6%
All managers	32.2%	21.9%	27.4%

135. Taken together,:-
- a. differences in involuntary exit rates are not statistically significant across managers or sexes;
 - b. involuntary exits for females as a proportion of those expected under Australian Life Tables are slowing by about 1% per year and
 - c. those for males are increasing at 2% per annum.
136. One needs to remember, however that population mortality rates are falling. Thus if involuntary exit rates continue to be proportionate to population mortality rates, they will fall.

12.1.3 Voluntary Exits

137. The following table shows voluntary exit rates per year of exposure.

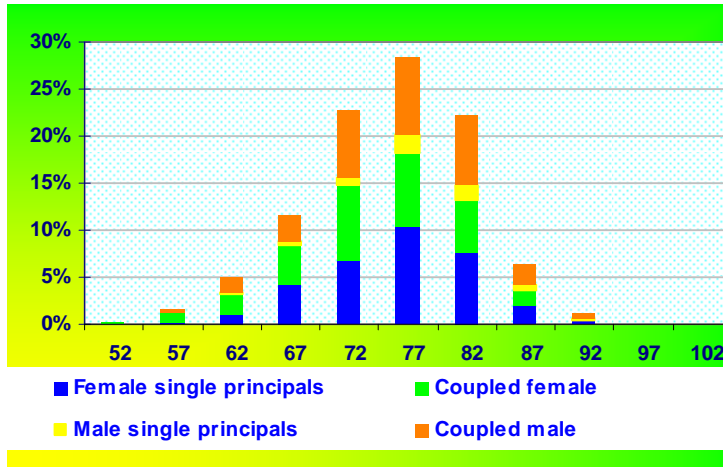
	Females	Males	People
Manager 1	4.1%	5.0%	4.4%
Manager 2	1.3%	1.6%	1.4%
Manager 3	0.6%	0.0%	0.4%
All managers	1.8%	2.0%	1.9%

138. The difference between the voluntary exit rates of different managers is statistically significant. In one case, voluntary exits comprised slightly over half of all exits, in another they were around a quarter and in the third case less than 10% of exits.
139. For one manager, there is statistically significant evidence that voluntary exit rates fall with duration, but in combination, the evidence is not statistically significant.
140. The differences in the voluntary exit experience of different managers may depend on: -
- a. the contract between the managers and the residents;
 - b. the availability of other care options or
 - c. the way in which the managers classify exits.
141. Regardless of the reason, voluntary exits need careful attention.

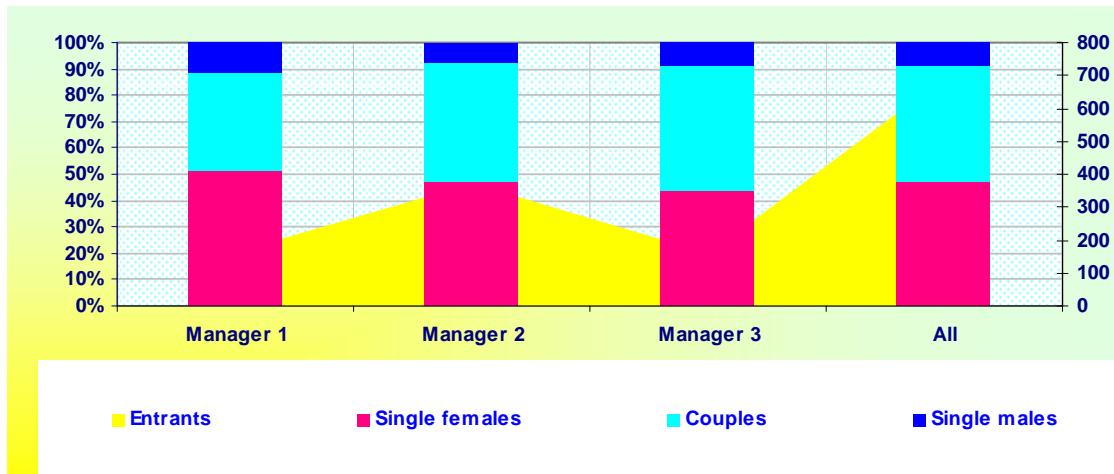
12.2 Entry distributions

12.2.1 Sex / Conjugal Proportions

142. The following chart shows the distribution of new residents (people, not households) during the period under review.



143. The chart and table below shows household entrants by sex and conjugal condition. The number of entrants is shown against the right hand axis of the chart.



	Single females	Single males	Couples
Manager 1	51.2%	11.7%	37.0%
Manager 2	47.2%	7.5%	45.3%
Manager 3	44.1%	8.7%	47.2%
All managers	47.4%	8.7%	43.8%

144. It is noticeable that Manager 1 has a higher proportion of single males (generally the group that experiences the fastest exits) and a lower proportion of couples (generally the

group that experiences the slowest exits). The difference between the managers' distributions however, is not statistically significant.

145. There is no evidence of statistically significant variation in the entry distribution over time. This is true globally and for each individual manager.

12.2.2 Average Ages

146. The following table shows the average ages of entrants of each sex and conjugal condition for each manager.

	Single female	Coupled female	Single male	Coupled male
Manager 1	77.6	76.7	78.9	78.6
Manager 2	76.3	72.7	76.3	75.4
Manager 3	74.6	72.9	77.5	75.7
All managers	76.3	73.5	77.4	76.1

147. The entry ages of Manager 1's female and coupled male entrants are statistically significantly higher than the global ages. This is not surprising as different managers appeal to different populations.

148. Average ages of entry have, with the exception of single males for one manager, all trended up. The uptrend is statistically significant for one manager only for coupled males. In this case, the increase in age is 0.55 years per annum.

149. For another manager, the upward trend is significant only for coupled females and coupled males with increases of 0.33 and 0.43 years per annum.

150. For a third manager, the uptrend is significant for single entrants of both sexes. Single females' entry ages increased at 0.20 years per annum and single males' entry ages at 1.21 years per annum. For this manager, the rate of increase in the age of coupled females was 0.32 years per annum and this was just significant at the 10% level.

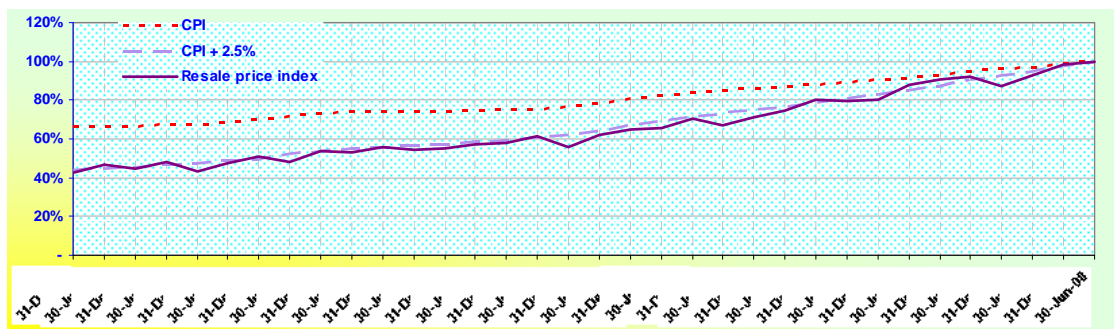
12.3 General comments on demographic effects

151. From the perspective of the effects on the value of the manager's interests, lower exit rates and lower entry ages are negative and higher exit rates and entry ages are positive. While community mortality rates continue to fall, unless village exit rates rise as a proportion of standard and offset community rates, the experience will deteriorate. This will have a negative effect on values.

152. Rising entry ages will counter this effect somewhat.

12.4 Value growth

153. The following chart shows the Case Shiller Index for one of the managers. This indicates that prices of the manager's units have grown at approximately 2.5% above the CPI for a considerable period. The experience of the other managers was similar.



- iii. increments all totals and counts.

158. The re use of units on vacancy is a significant difference from usual actuarial practice. It raises the issue of the perpetual nature of the manager's interests. Some models project accurately with allowance for new occupants every time there is a projected vacancy for a number of years until the cash flow is relatively stable then value an average stable cash flow in perpetuity.

159. A simple alternative way of handling this in valuations is to use the TVF. The expected present value of all future interests is simply the TVF times the expected present value of the reversion of a vacant unit to the manager. This expected reversion can be used in the individual and macro driven calculations described above.

160. The above needs slight modification. Often managers are obliged to make payments for the outgoing resident at the time of vacation, but the manager's inward cashflows and the interests they create only occur at the time of reoccupancy. The TVF can therefore only be applied when a new unit is sold. For this reason, the present value of future interests needs to be adjusted to allow for the interlude from vacation to sale.

161. If cash flow projections and exit projections are needed, the macro driven processes can sum exits and cashflows of individual units. This produces the required information for currently occupied units. It is a simple matter to apply cashflows and exits from new entrants to expected exits in each year. This produces additional cashflows and exits for future years and thus completes the projections.

162. If cash flows are prepared, they can and should be discounted to reconcile to the valuation.

14 ASSUMPTIONS

163. This section sets out the assumptions used in the remainder of this paper. It also comments on the suitability of the assumptions for use by actuaries in situations where experience is unavailable. As is usual in setting assumptions, one needs to constantly consider whether the past is a reasonable predictor of the future.

14.1 Demographic

164. The remainder of this paper is based on the demographic assumptions drawn from this experience, namely: -

- a. mortality rates of 29% and 54% of Australian Life Tables 2000-02 for females and males respectively;
- b. other involuntary exit rates of 32% and 22% of Australian Life Tables 2000-02 for females and males respectively;
- c. voluntary exits 1.9% per annum regardless of sex, age or duration and
- d. new entrants comprising-
 - i. 43% couples of female age 74 and male age 76,
 - ii. 48% single females aged 76 and

- iii. 9% single males aged 77.

165. In the absence of detailed experience, these demographic assumptions could generally be applied to villages in metropolitan areas. For villages in “sea change” locations, a younger (perhaps as much as five to ten years younger) and more married (perhaps as much as 50 to 67% couples) distribution might be appropriate. Care is needed in setting the voluntary exit assumptions.

14.2 Financial

166. The remainder of this paper is based on the unit value growth assumptions drawn from this experience, namely that unit prices will increase at a rate of 2.5% above CPI inflation. If one assumes CPI inflation in the middle of the Reserve Bank of Australia’s 2 to 3% target range, the annual growth rate is 5%.

167. In the absence of detailed experience, it would be acceptable to assume real growth of 2.5%, but a lower rate could also be justified. In the writer’s experience, it is rare for villages to sustain real growth faster than 2.5% per annum and negative real growth is also rare.

168. The discount rate to be used in retirement village calculations is difficult to assess. Much sales evidence is contaminated by the existence of raw land or unsold units.

169. Furthermore, because of the methodological problems with some valuations, which may have determined the price of a sold village, the discount rate quoted in such valuations is not the true discount rate implied by the transaction. It is erroneous to use the quoted discount rate of such a valuation as sales evidence. A valuation based on erroneous calculation techniques or assumptions produces a different result from a “correct” valuation using the same discount rate. If data is available, one can iterate “correct” valuations to obtain the true discount rate underlying a transaction.

170. A reasonable range of discount rates for operating villages is between 4 and 8% above the long term bond rate. This paper assumes a discount rate of 10% per annum.

171. The discount rate margin above the bond rate depends on the particular circumstances of the subject village. The lowest margin is only applicable to a mature village in excellent condition and in a strong catchment area. The highest margin could be used when a village is new and still being populated, in need of maintenance, suffering vacancies or in a declining catchment area.

14.3 Other assumptions

172. The remainder of this paper assumes: -

- a. the manager receiving a deferred management fee of 4% of reallocation price per year of occupancy to a maximum of 28%;
- b. a three month delay between exit and reoccupancy;
- c. a manager’s refurbishment cost of 5% of reallocation price;
- d. no special arrangements for moving to another level of care;

- e. no payments to or by the managers in connection with sales of vacant units and
- f. the manager paying 0.25% of reallocation price each year to maintain the quality of the village.

173. In other cases, assumptions of this nature will be derived from the particular situation of the subject village.

15 ACTUARIAL INSIGHTS

174. The actuarial profession can bring a number of insights to managers of retirement villages and their advisers. To actuaries, many may be obvious, but they are not obvious to many industry participants. Disturbingly, some of the fallacies that will be identified in this section have existed in the industry and still persist.

175. Trivial as some of the insights in this section may be to actuaries, they are worthy of note because they identify a point of difference between what actuaries and some other industry participants can do.

15.1 The Fallacy of Aging Entrants

176. Some village operators have noted that current residents with longer occupancies tend to have entered the village at younger ages than those who have been occupants for a shorter period. From this, they assert that ages at occupancy have been rising. To an actuary, this obviously ignores the fact that the probability of an early older entrant still being a current resident is less than that associated with an early younger resident.

15.2 Occupancy Durations

15.2.1 Occupancy Expectations

177. In the early days of the industry, some inferred future occupancy durations from the average duration of occupancy of those who had left a village.

178. To actuaries, this obviously fails to include the contribution of current occupants to the average occupancy duration. For this reason, an actuary will build an occupancy expectation from exit rates, not from the duration of those who have exited.

179. The analysis uses multiple decrement tables, with which actuaries are familiar from their studies and superannuation work. Actuaries know that such tables can be duration specific or age and sex specific. They also intuitively suspect a relationship between involuntary exit rates and standard life tables.

15.2.2 Last Survivorship

180. Actuaries know that the expectation of occupancy of the last survivor of a couple is not the expectancy of the younger member of the couple. On the assumptions set out above, the occupancy expectation of a female member of a couple is 14.6 years, while that of a male is 10.6 years. The last survivor expectancy is 17.4 years. The impact of this can be measured

by TVFs. For the female, the TVF is 13.14% of purchase price. Allowing for the last survivor exit results in a TVF of 11.72%.

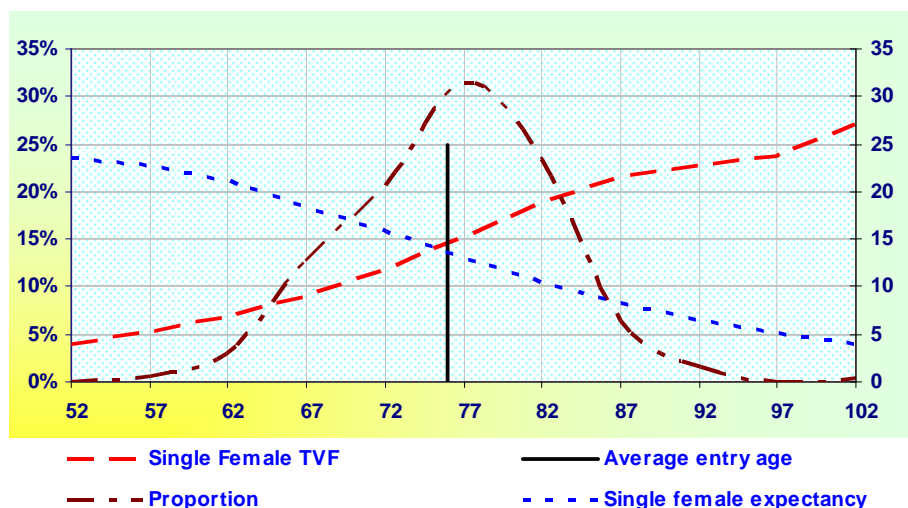
181. Failing to recognise the difference between the exit of the younger and the last survivor results in a material overstatement of the value of the manager's interests in a couple and thus of the overall value of the manager's interests.

15.3 Entry Distributions

182. Actuaries know that not all occupants will enter at the average entry age. There is a range of such ages around the average. Each age has its own expectancy and TVF. Actuaries know that it is possible that the average of the expectancies and TVFs do not equal the expectancy and TVF at the average age of entry.

183. The chart below shows, for single females, :-

- a. the average entry age;
- b. the occupancy expectancy at quinquennial ages (RHS);
- c. the TVF assuming all entrants are single females of various quinquennial ages and
- d. the proportion of single females entering in quinquennial age groups.

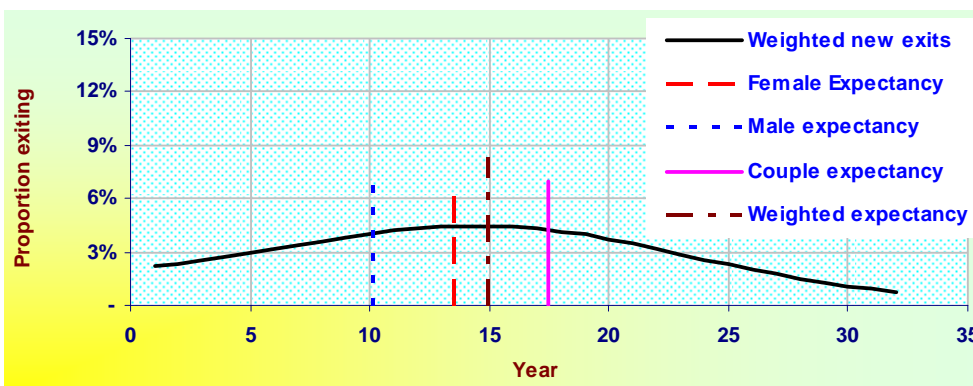
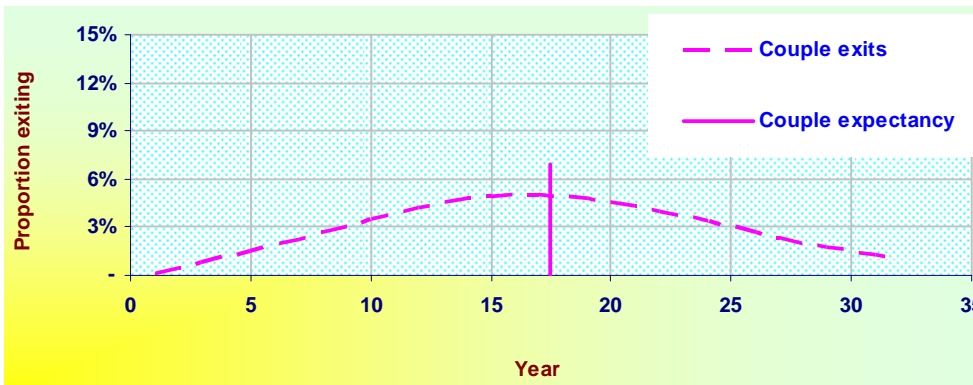
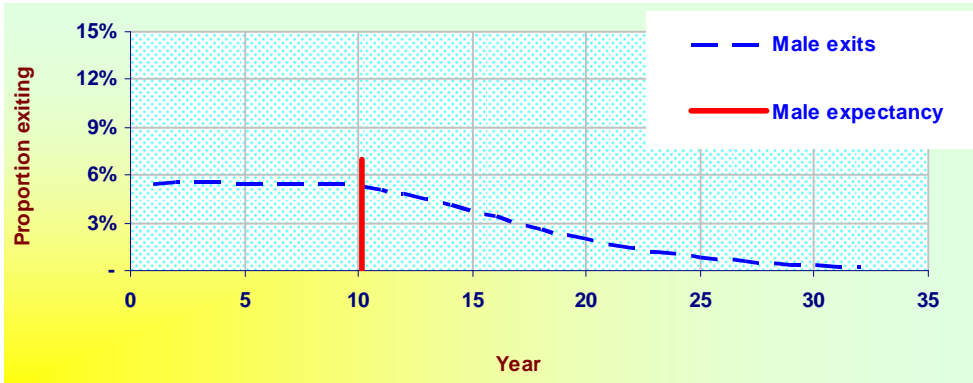


184. Inspection of the chart reveals that the expectancies and TVFs are close to linear at the ages where the bulk of the entrants occur. This suggests it is appropriate to use the TVF at the average entry rather than a weighted average of the TVFs at each age. This is confirmed by the fact that the TVF at the average entry age of 76 years is 14.56% compared with a weighted average over quinquennial entry ages of 14.84%. Similar conclusions apply to couples and single males. This linearity is justification for using single ages at entry, rather than a distribution of those ages in the assumptions underlying this paper.

15.4 Occupancy Distributions

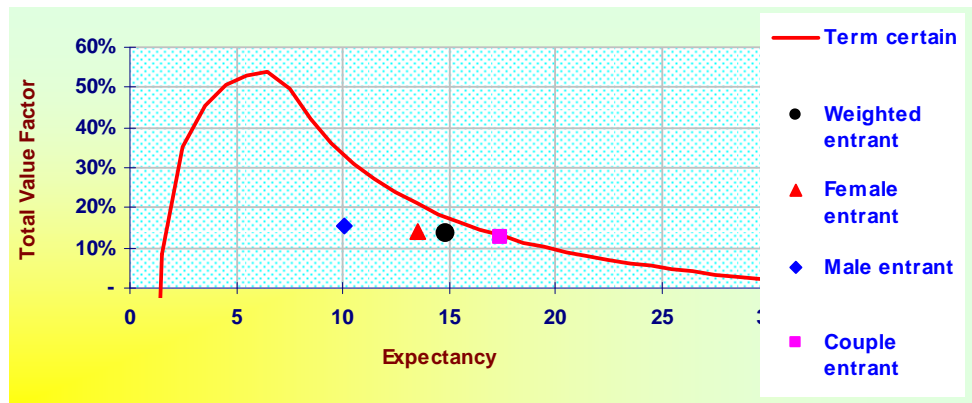
185. Actuaries know that the occupancy expectancy is a single measure that summarises a probability distribution. They recognise that one needs to be careful in its use, particularly in the presence of discounting and or linear relationships.

186. As the following charts show, the probability distribution of exits of males is far from symmetric, while that for couples is approaching a symmetric distribution. Assuming all exits take place at the occupancy expectation is fraught.



187. The impact of the distribution of exits can be seen by considering the TVFs that would apply for terms certain and those which apply for new entrants subject to an exit distribution. The term certain TVF is, for any duration, the TVF that would apply if all exits (including those related to replacement) occurred at that duration. The following chart shows: -

- a. the term certain TVF;
- b. the TVF applicable to each sex and conjugal condition new residency and
- c. the weighted new entrant TVF.



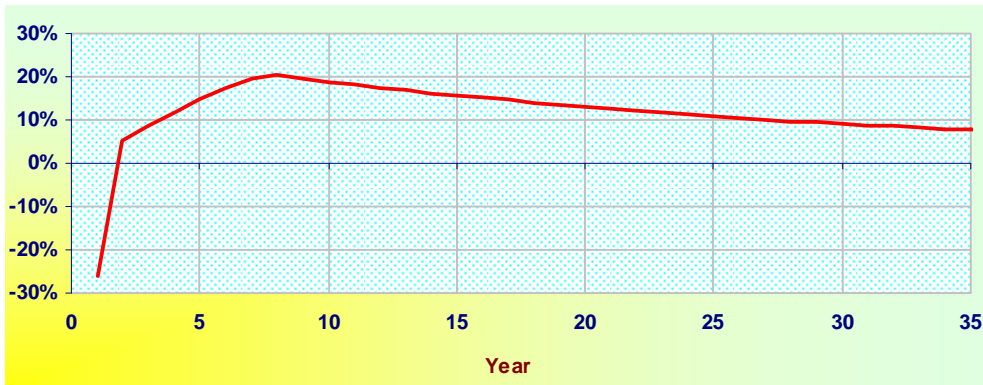
188. The following table shows the expectancies and TVFs plotted on the chart and the measure of overstatement.

Group	Expectancy years	TVF	Term certain TVF	Proportionate overstatement
Single female	13.6	15.32%	20.81%	35.9%
Single male	10.1	17.07%	32.95%	93.0%
Couple	17.4	13.66%	13.04%	-4.5%
Weighted average	14.9	13.49%	17.64%	30.8%

189. The table and the chart demonstrate that simply assuming all exits will occur at the occupancy expectation gravely overstates the value of the manager’s interests in a new occupancy. This points to distortion of values associated with other occupied units if a similar simplification is used for their calculations.

15.5 Optimum Curve of Exits

190. Actuaries know that the value of a manager’s interests in a particular retirement village unit is the sum of the present values of receipts on exit in each year weighted by the probability of exit in the year. The chart below shows the unweighted present values as a proportion of the purchase price.

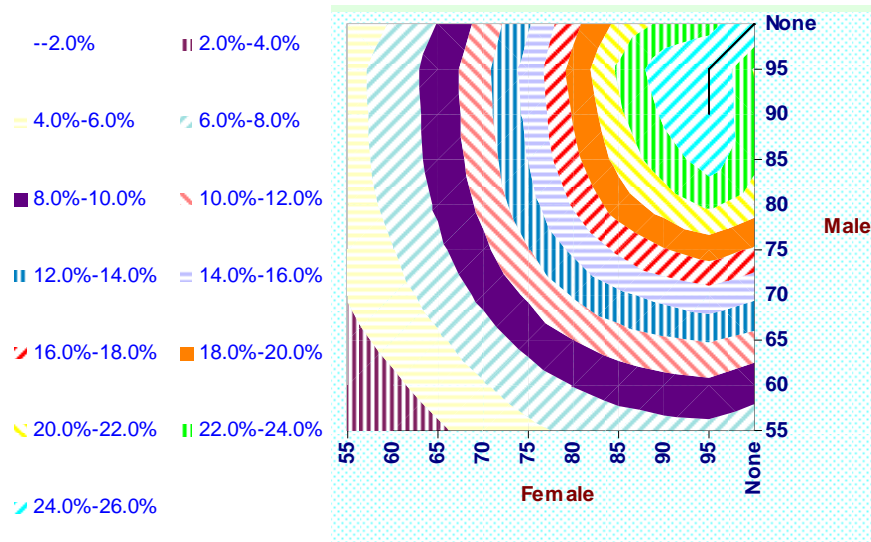


191. The shape of the curve clearly reflects the increasing DMF up to eight years. It is the shape of this curve that determines the extent of the departures of actual TVFs from term certain TVFs in the previous section.

192. The optimum entrant from the manager's perspective is the entrant whose curve of exits concentrates at the higher values of the present value chart. The manager wants to avoid exits in the very early years and maximise them in the range eight to fifteen years. This leads to a situation in which the manager is sometimes better to have a couple than a single entrant, despite the fact that the couple has a longer occupancy expectancy and would intuitively be considered of lower value than a single resident would.

193. In particular, for example, under the assumptions of this paper, a manager would rather have a female entrant aged 75 coupled with a male aged around 77 or more than the same female entrant being single. At and after age 90, coupled entrants are of greater value to the manager than are single entrants of the same age.

194. The insight leads to the following chart, and table, which show the TVF applicable to various combinations of male and female ages. These assume subsequent sales are to the same combination of ages, not the standard entry distribution. While in practice, entry combinations will tend to be concentrated around a diagonal starting at say females aged 55 and males 57 or 58, the information quantifies the benefits to the manager of having older entrants. It is useful in helping managers to target their marketing efforts.



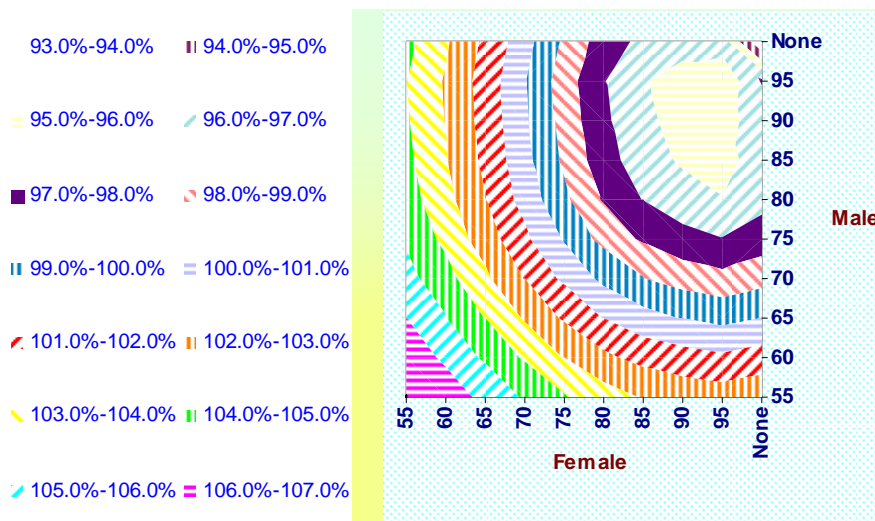
	Female age									
Male age	55	60	65	70	75	80	85	90	95	None
55	2.1%	2.9%	3.8%	4.7%	5.6%	6.4%	7.0%	7.3%	7.5%	6.8%
60	2.8%	3.7%	4.7%	5.8%	7.0%	8.1%	8.8%	9.3%	9.6%	8.8%
65	3.5%	4.5%	5.7%	7.1%	8.6%	10.0%	11.0%	11.7%	12.2%	11.3%
70	4.1%	5.3%	6.7%	8.4%	10.3%	12.2%	13.6%	14.7%	15.3%	14.4%
75	4.7%	6.0%	7.6%	9.6%	11.9%	14.4%	16.4%	17.9%	18.8%	17.7%
80	5.1%	6.5%	8.3%	10.5%	13.3%	16.3%	18.9%	20.9%	22.4%	21.0%
85	5.3%	6.7%	8.6%	11.0%	14.1%	17.5%	20.6%	23.1%	24.9%	22.5%
90	5.3%	6.8%	8.8%	11.3%	14.5%	18.2%	21.6%	24.4%	26.4%	22.4%
95	5.4%	6.9%	8.8%	11.4%	14.8%	18.6%	22.3%	25.3%	27.5%	21.9%
None	4.7%	6.2%	8.1%	10.6%	13.8%	17.5%	20.5%	22.4%	23.4%	30.7%

15.6 Equivalent Prices

195. The knowledge of expected exits can lead to the concept of equivalent prices. These allow the manager to determine the prices at which a unit can be sold to a particular household to have the same total value to the manager as a unit sold to a different entrant household. The table and chart below are based on a standard entry household comprising a female aged 74 and a male aged 76 and show the price, as a percentage of the price paid by the standard entry household to achieve equivalent total value for the manager.

	Female age									
Male age	55	60	65	70	75	80	85	90	95	None
55	107.0	106.2	105.4	104.6	103.9	103.2	102.8	102.5	102.4	102.7
60	106.3	105.5	104.6	103.7	102.8	102.1	101.6	101.3	101.1	101.4
65	105.7	104.8	103.8	102.7	101.8	100.9	100.3	100.0	99.8	100.1

	Female age									
Male age	55	60	65	70	75	80	85	90	95	None
70	105.1	104.1	103.0	101.9	100.8	99.8	99.1	98.7	98.4	98.8
75	104.6	103.6	102.4	101.2	99.9	98.8	98.0	97.5	97.2	97.8
80	104.2	103.2	101.9	100.6	99.3	98.0	97.2	96.6	96.3	97.1
85	104.0	102.9	101.7	100.3	98.9	97.6	96.7	96.2	95.9	97.1
90	103.9	102.8	101.6	100.2	98.7	97.4	96.5	96.0	95.7	97.4
95	103.9	102.8	101.5	100.1	98.6	97.3	96.4	95.9	95.6	97.7
None	104.2	103.1	101.8	100.4	99.0	97.8	97.2	97.0	97.2	



196. The foregoing assumes subsequent sales to the new entrant distribution underlying the TVF, not to the couples referred to in the table and chart. This contrasts with the preceding information, which assumed resale to the distribution under consideration.

197. The interpretation of the above is that the manager should be indifferent to selling a unit to a couple both aged 80 (bolded in the table above) at a 2% discount or selling a unit to a couple aged 74 and 76 at full price.

198. Managers can legally differentiate prices based on age, but, in practice, rarely do so. They are reluctant to vary their prices to avoid dissatisfaction of early purchasers. Furthermore, the information is most useful if applied consistently over a large number of units. Thus, at the level of individual units, information about equivalent prices is of limited use. On a whole of village basis, however, it can assist in pricing and targeting.

15.7 Sensitivity Analyses

199. Actuaries are familiar with the need for sensitivity analyses. While village valuations require complete sensitivity analyses, analysis of the sensitivity of the TVF to changes in assumptions is a useful shorthand method. This section sets out some sensitivity analyses of

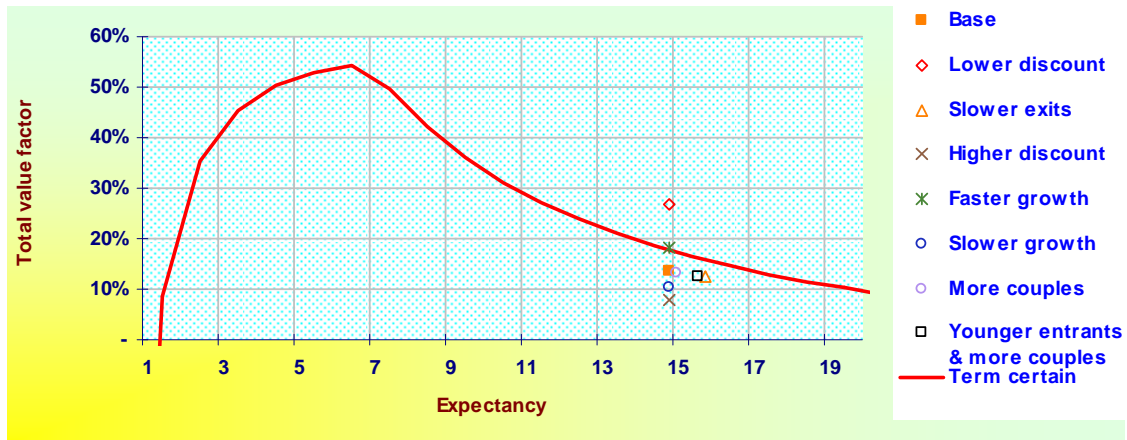
the effect of departures from the assumptions of this paper. Its purpose is to give an indication of the relative importance of the various assumptions.

15.7.1 General

200. A general sensitivity analysis is set out in the following chart and table. They show the effect on the TVF and occupancy expectancy of:

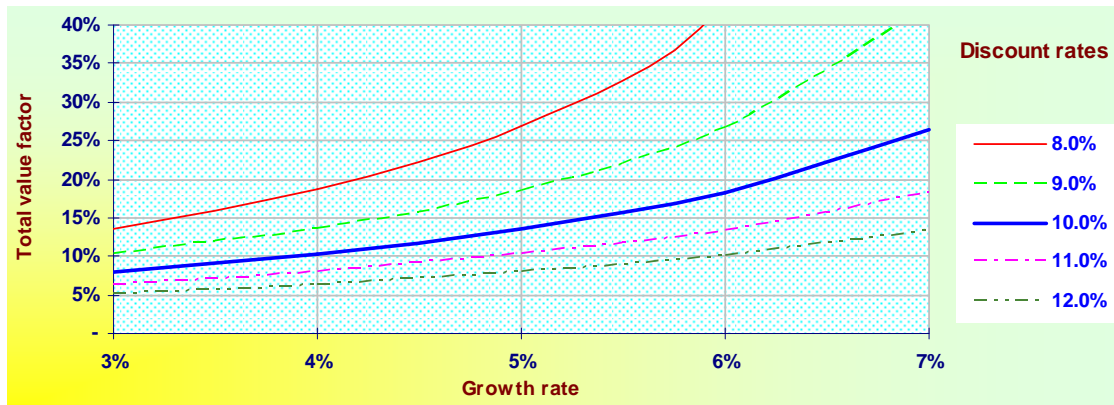
- a. reducing the discount rate by 2% (“lower discount”);
- b. reducing exit rates to 90% of the base case (“slower exit”);
- c. increasing the discount rate by 2% (“higher discount”);
- d. increasing the value growth rate by 1% (“faster growth”);
- e. reducing the value growth rate by 1% (“slower growth”);
- f. increasing the proportion of couples by 10% of the base proportion (“more couples”) and
- g. maintaining the increased proportion of couples and reducing all entry ages by one year (“younger entrants and more couples”).

Description	Base	Lower discount	Slower exits	Higher discount	Faster growth	Slower growth	More couples	Younger entrants & more couples
Discount rate	10%	8%	10%	12%	10%	10%	10%	10%
Value inflation	5%	5%	5%	5%	6%	4%	5%	5%
Exit scale	100%	100%	90%	100%	100%	100%	100%	100%
Male age couples	76	76	76	76	76	76	76	75
Single female age	76	76	76	76	76	76	76	75
Single male age	77	77	77	77	77	77	77	76
Female age couples	74	74	74	74	74	74	74	73
Proportion couples	43.00%	43.00%	43.00%	43.00%	43.00%	43.00%	47.30%	47.30%
Proportion females	48.00%	48.00%	48.00%	48.00%	48.00%	48.00%	44.38%	44.38%
Proportion males	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	8.32%	8.32%
Total value factor	13.5%	26.9%	12.4%	7.9%	18.3%	10.3%	13.3%	12.6%
New entrant expectancy	14.9	14.9	15.9	14.9	14.9	14.9	15.1	15.7
TVF proportion base %	100.0	199.1	91.8	58.9	135.9	76.3	98.9	93.5
Expectancy proportion base %	100.0	100.0	106.3	100.0	100.0	100.0	101.3	105.2



15.7.2 Financial

201. The chart and table below show the sensitivity of TVFs to changes in the financial assumptions. As all of the amounts involved in transactions between the resident and manager are related to reallocation price, in this example, one would expect the TVF to be directly related to the real discount rate. In fact, this is not exactly the case due to the influence of delays in new occupancies priced on values at the time of exit. Where DMFs are based on the purchase price, rather than the reallocation price, the close association with the real discount rate does not apply.



Growth rate	Discount rate				
	8%	9%	10%	11%	12%
3%	13.7%	10.3%	8.0%	6.3%	5.1%
4%	18.6%	13.6%	10.3%	8.0%	6.3%
5%	26.9%	18.5%	13.5%	10.2%	7.9%
6%	43.1%	26.6%	18.3%	13.4%	10.2%
7%	88.3%	42.6%	26.4%	18.2%	13.3%

15.7.3 Demographic

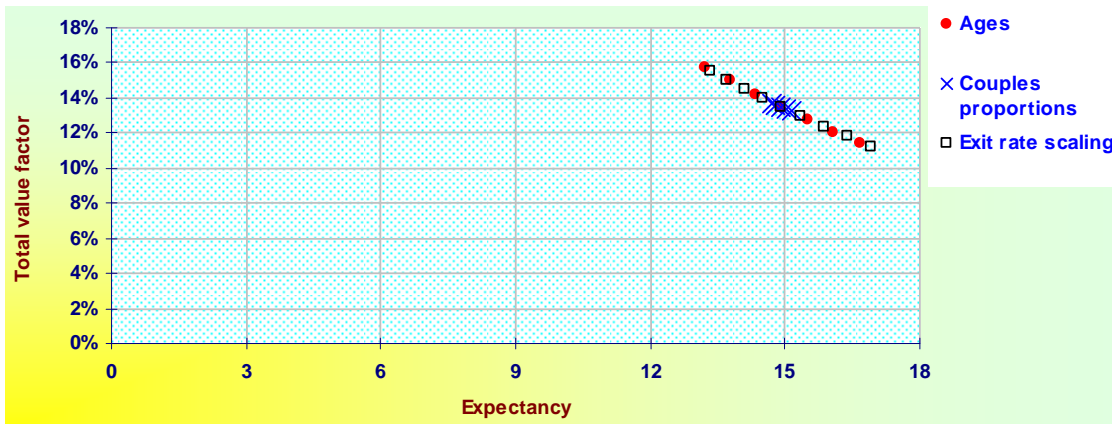
202. The following tables and chart show the effect on the TVF and occupancy expectations of successive changes of: -

- a. one year in entry ages ("Ages");
- b. 2.5% in the proportion of couples ("Couples proportion") and
- c. 5% of the assumed exit rates ("Exit rate scaling").

	-3 years	-2 years	-1 year	Base	+1 year	+2 years	+3 years
Partnered male age	73	74	75	76	77	78	79
Single female age	73	74	75	76	77	78	79
Single male age	74	75	76	77	78	79	80
Partnered female age	71	72	73	74	75	76	77
Total value factor	11.4%	12.1%	12.8%	13.5%	14.2%	15.0%	15.8%
Expectation years	16.7	16.1	15.5	14.9	14.3	13.8	13.2
TVF / base %	84.4	89.4	94.6	100.0	105.6	111.2	117.0
Expectation / base %	111.8	107.8	103.9	100.0	96.1	92.3	88.5

	5% lower	2.5% lower	Base	2.5% higher	5% higher
Proportion couples	38.0%	40.5%	43.0%	45.5%	48.0%
Proportion females	52.2%	50.1%	48.0%	45.9%	43.8%
Proportion males	9.8%	9.4%	9.0%	8.6%	8.2%
Total value factor	13.7%	13.6%	13.5%	13.4%	13.3%
Expectation years	14.7	14.8	14.9	15.0	15.1
TVF / base %	101.3	100.7	100.0	99.4	98.7
Expectation / base %	98.5	99.3	100.0	100.7	101.5

	Total value factor	Expectation years	TVF / base %	Expectation / base %
Proportion of standard exit rates				
80%	11.2%	16.9	83.0	113.6
85%	11.8%	16.4	87.5	109.8
90%	12.4%	15.9	91.8	106.3
95%	12.9%	15.4	96.0	103.1
100%	13.5%	14.9	100.0	100.0
105%	14.0%	14.5	103.9	97.1
110%	14.5%	14.1	107.7	94.5
115%	15.0%	13.7	111.4	91.9
120%	15.5%	13.4	115.0	89.5



15.8 Confidence Intervals on Cashflows

203. Actuaries know that the number of exits from a village in a particular year follow a binomial distribution. Assuming a village of 200 single occupants and an exit probability of 5% (associated with a female aged 82 or a male aged 76), the expected number of exits is of course ten. However, there is a 20% probability of fewer than seven. Actuaries can readily determine confidence intervals on projected future exits.

204. Confidence intervals on cashflows for a year are more complex as they overlay the distribution of contractual payments on the distribution of exits. Simulations can provide the distributions of cashflows. In practice, the variability in exits is sufficient to draw managers to the conclusion that projected cash flows are only reliable for determining the capital value of their interests, and are not a basis for year to year budgeting.

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- ¹ ABS: Housing Occupancy and Costs, Australia, 1995-96 (cat. no. 4130.0)
² ABS Population Projections, Australia, 2004 to 2101 (cat no 3222.0)
³ ABS Housing Motivations and Intentions, Western Australia, Oct 2005 (cat no8710.5)
⁴ “A Vision Becomes Reality” Richard Cleaver ISBN 0-958 1223-0-X p38
⁵ Cleaver op cit p80
⁶ The Prime Retirement & Aged Care Property Trust (“PTN”) Pre-ASX listing presentation August 2007 provided by Paterson Securities Ltd
⁷ Case, K. E., and Shiller, R.J. (1989). “The Efficiency of the Market for Single-Family Homes”, *The American Economic Review* 79, 125-137. See also
http://www2.standardandpoors.com/spf/pdf/index/SPCS_MetroArea_HomePrices_Methodology.pdf