

**CONTINUING CARE RETIREMENT COMMUNITIES
— ATTRACTIVE TO MEMBERS, BUT WHAT ABOUT SPONSORS?**

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ABSTRACT

This paper is concerned with the development and operation of Continuing Care Retirement Communities (CCRCs). The paper examines the financial structure of a CCRC, being developed by the Joseph Rowntree Housing Trust, and describes a population model utilising transition probabilities to project care needs and financial performance.

The paper then explores the possibility of commercial organisations becoming involved in this market, and examines the risks that such a venture would entail and the strategies that may be adopted to reduce these risks.

KEYWORDS

Continuing Care Retirement Communities; Transition Probabilities; Activities of Daily Living

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1. INTRODUCTION

1.1 Recent years have seen a considerable increase in public awareness of the issues relating to the financing of long-term care for the elderly. The actuarial profession has been actively involved in this area, and has produced technical papers, discussed the issues at professional meetings, and taken part in consultations with government.

1.2 The public sector currently provides long-term care for the elderly in the following settings:

- (1) geriatric beds in National Health Service (NHS) hospitals;
- (2) domiciliary care provided by local authority social services, subject to a discretionary means tested charge;
- (3) residential or nursing care provided in private sector homes, financed by local authority social services and subject to a means tested charge; and
- (4) residential or nursing care provided in local authority homes, subject to a means tested charge.

1.3 In recent years, financial pressures in the NHS have encouraged the closure of geriatric wards. This has significantly reduced the scope for obtaining long-term care without a means tested charge. There have also been reductions in

the number of beds provided by local authorities for elderly care. With the proportion of the population over age 75 expected to increase from 7% to 12% over the next 40 years (Government Actuary, 1996), the private sector faces a rapidly growing market for long-term care provision, and the opportunity to capture the interest of potential customers with innovative solutions.

Table 1.1. Provision of beds for elderly (Department of Health and Office of Population Censuses & Surveys, 1995)

Category of establishment	Financial year of survey		
	1989-90	1991-92	1993-94
NHS Geriatric beds	44,000	37,500	32,000 (est.)
Local authority beds	105,400	86,700	69,000
Voluntary and private beds	180,400	199,600	210,000

1.4 At present, for those individuals who fail to qualify for state assistance the costs of long-term care are both uncertain and potentially large. Typical fees for a residential home in the South East of England are £20,000 p.a., with those for nursing homes being £25,000 p.a. or more. Only relatively few individuals in nursing homes are expected to live for many years, but those who do can incur fees of several hundreds of thousands of pounds.

1.5 Asset erosion on this scale is a major source of concern to the elderly. A particular area of concern has been the need for individuals to sell their homes (where these are not occupied by a surviving spouse) to meet the costs of care, rather than pass the value of these assets to their children. In addition, prolonged survival in a care home may force a resident to choose between moving to a less attractive home or being dependent on children meeting the excess of fees over the level of state support.

1.6 Long-term care insurance is intended to address such concerns, but as yet the public has shown relatively little inclination to purchase these products. In the United States of America, where there has been a longer exposure to these products, only 4% of those over age 65 had purchased a policy by 1990, despite studies suggesting that as many as 30% of this age group were potential policyholders (Cohen *et al.*, 1992; Cohen *et al.*, 1993). The main drawbacks, from the perspective of non-purchasers, may include cost, complicated product design and lack of incentives from government. The level of sales of this business in the United Kingdom is much lower, with total sales estimated at 30,000.

1.7 As we will discuss below, continuing care retirement communities provide an alternative solution, with the advantage of considerable social benefits.

2. CONTINUING CARE RETIREMENT COMMUNITIES

2.1 Background

2.1.1 Continuing care retirement communities (CCRCs) have been established

in the U.S.A. for many years, where they have been the subject of public and actuarial discussion. Communities of this type have been in existence since the beginning of the century, but the main growth in numbers has occurred in the last thirty years. This expansion has been particularly marked in this last decade, and by 1995 there were estimated to be 220,000 individuals residing in CCRCs (Conover & Sloan, 1995).

2.1.2 The first CCRCs were based on principles of religious mutual support, with members contributing according to their means rather than on the basis of estimates of likely cost. Members would often donate all their assets to the community, thereby combining a charitable donation with a payment for the promise of lifetime care. Indeed, the survival of these communities and their ability to accept a wide variety of applicants depended on the willingness of more wealthy members to contribute more than was required to meet their own expected costs.

2.1.3 In the 1970s new CCRCs were set up on the basis of attempting to match likely future costs against entrance fees. Unfortunately, some of these early estimates were made without actuarial advice and were too optimistic. In particular, population mortality was assumed to apply, without making any allowances for future improvements in mortality or for the fact that only relatively affluent individuals, with lighter expected mortality than the population at large, were able to meet the usually substantial costs of membership (Somers, 1993; Brower, 1994). This overestimation of mortality rates may have been exacerbated by the very success of the CCRCs in providing an attractive and fulfilling social environment for their members, leading to increased life expectancy.

2.1.4 At that time initial entrance fees were intended to cover most, if not all, of the costs of future care, rather than giving management the flexibility provided by substantial annual fees which could be increased in the event of adverse experience. The unexpectedly low mortality rates resulted in these charges being insufficient.

2.1.5 As a result of no actuarial review being carried out, the fact that members were living longer than expected was not recognised at an early date. In consequence, some CCRCs only recognised that they were in financial difficulties when it was too late to attempt remedial action (for example by increasing annual fees). As well as causing distress and financial hardship for the members, these failures gave rise to significant adverse publicity for the concept of CCRCs, including that arising from Congressional hearings on the subject. As a result, the rate of establishment of new CCRCs slowed markedly in the 1980s, although we understand that this was not uniform, with some areas showing continued growth.

2.1.6 It is now widely recognised in the U.S.A. that actuarial advice is required properly to analyse the financial viability of a CCRC, and the Society of Actuaries has issued a guidance note on the production of actuarial reports on the financial position of a CCRC (Committee on Continuing Care Retirement Communities, 1994). Furthermore, although the degree of regulation of CCRCs varies widely

between states, approximately half of those states with legislation in place demand that regular actuarial reviews be performed (Conover & Sloan, 1995).

2.2 What is a CCRC?

2.2.1 A typical CCRC consists of independent living units grouped around a residential/nursing care centre, catering for a population of around 300 individuals. These independent living units may be flats or bungalows, designed for single or joint occupancy.

2.2.2 CCRCs will normally provide a range of other facilities, such as a restaurant, shop or pool, depending on the scale of the community, and services such as linen, security and transportation. For example, at Medford Leas, a large and particularly well publicised CCRC in New Jersey with 570 members, three separate facilities offer residential, nursing and advanced nursing care, in combination with a dedicated outpatients department. Over 70 different part-time activities are catered for in the communal buildings and surrounding grounds (Rodermund, 1990).

2.2.3 New members of a CCRC do not normally need long-term care at entry, but are typically elderly (on average age 78 (Cohen *et al.*, 1989; Brace, 1994) and concerned about what will happen when long-term care is required. Hence, the attractions of belonging to a CCRC include the following (Cohen *et al.*, 1988a):

- (1) assistance to enable the member to live independently for as long as possible;
- (2) transfer to residential/nursing care within the grounds of the community, enabling easy access to spouse and fellow members of the CCRC for visiting;
- (3) financial security, resulting from the fact that the annual subscription is independent of the level of care provided;
- (4) physical security; and
- (5) membership of a genuine community.

2.2.4 CCRCs in the U.S.A. have been categorised into three types, with approximately equal numbers of each. This classification is based on the way in which long-term care needs are financed (Brower, 1994):

- (1) *Type A or Extensive*: subscriptions set at a level intended to cover all long-term care needs of members, but often with the flexibility to vary annual fees;
- (2) *Type B or Modified*: subscriptions set at a level intended to cover care up to a maximum cost, with additional needs being paid for by the individual as and when needed; and
- (3) *Type C or Fee-for-service*: members pay for their individual usage of care facilities.

2.2.5 Extensive contracts are more commonly found in the larger CCRCs, where care demands can be better predicted. In contrast, sponsors of multiple

CCRCs are more likely to offer modified or fee-for-service rather than extensive. Extensive contracts are more heavily regulated in the way that assets can be used, and may commit the parent company to a considerable financial obligation. As such, the parent company may find the burden of more than one extensive CCRC too onerous (Sloan *et al.*, 1995).

2.2.6 As far as we are aware, all those CCRCs in the U.K. that charge fees fall into the Type C category, which does not insulate the individual from the financial effect of long-term care.

2.2.7 In this paper we will focus on Type A CCRCs, as they illustrate fully the range of risks presented by CCRCs to management.

3. A CASE STUDY

3.1 The Joseph Rowntree Housing Trust is currently developing what we understand is the first CCRC in the U.K. in the Type A category. The CCRC, 'Hartrigg Oaks', is located in the village of New Earswick near York, and is the subject of our case study. It is the intention of the trustees that this CCRC should be a guide to help other organisations in their development of future CCRCs, and hence the Trustees have decided to make public details of the CCRC and its finances.

3.2 The CCRC is managed by the Trustees of the Joseph Rowntree Housing Trust ('the Trust') and others as may be appointed by them. When the Joseph Rowntree Housing Trust was set up as distinct from the Joseph Rowntree Foundation ('the Foundation'), part of its assets included the land on which the proposed CCRC is built.

3.3 The Trust has provided the CCRC with a loan of £5.8 million, of which £3.7 million is represented by the land underlying the CCRC. The remaining £2.1 million of this loan is intended to cover the cost of constructing the communal facilities. The portion of the land underlying the communal facilities, as opposed to the entire CCRC, is valued at £1.2 million, and the entire loan is to be repaid out of any surplus generated by the CCRC.

3.4 The Foundation has provided the CCRC with a loan of £11.6 million, which is intended to cover the cost of constructing the bungalows. The loan will be repaid primarily from initial membership fees, and, once the loan to the Trust is repaid, from surplus generated by the CCRC. Neither loan has a set term of repayment.

3.5 Before becoming members of the CCRC, individuals must undergo an initial healthcheck and financial screening to ensure both, that they will not make heavier demands on the communal care facilities than would be expected for their age, and that they are able to meet the future annual fees.

3.6 On entering the community, an individual or couple will pay an initial membership fee, based on the size and specifications of the bungalow selected. The following options are available:

- (1) *a refundable membership fee*: under this arrangement the amount of the fee depends only on the size and quality of the bungalow selected, and the nominal amount of the fee is returned to the member's estate on death, or to the member if he or she leaves the community;
- (2) *a non-refundable membership fee*: the amount of this fee is dependent both on the type of bungalow selected and the age of the individual (both ages in the case of a couple); there is normally no refund on death or exit, unless this occurs within 5 years of joining the community; in which case a proportion of the fee (reducing from 100% in the first 6 months to zero, linearly, over months 7 to 56) is returned to the member or his or her estate; and
- (3) *an annual membership fee*: this is only dependent on the type of bungalow selected, and not the age of the member, and is paid throughout the period of membership.

3.7 In addition, members pay an annual subscription to the community. This is used in the running of the care and non-care communal facilities and to provide assistance in the bungalows. The proposed scales for refundable membership fees and for annual subscriptions are set out in Appendix A.

3.8 If one partner of a couple fails the initial health screening, the couple will still be admitted to the CCRC. However, the partner failing the health screening, although admitted as a full member, will be required to meet the full amount of any care costs, as and when they arise. These members will pay a reduced annual subscription, covering only the non-care facilities, and only so long as they are resident in the bungalows.

3.9 These financial arrangements do not aim for a close matching of assets and liabilities or of income and outgo, or strict equity between members. Rather, they have been designed to provide a package which will appeal to members and does not expose the sponsor to a degree of risk which, having regard to its objectives and financing, it considers unacceptable. As such, it is, in concept, part way between the founding CCRCs in the U.S.A., with their pronounced element of charitable donation, and a commercially run CCRC that is likely to want to match charges closely to expected costs, and, as far as possible, insulate itself from risks.

4. PROJECTION MODEL UNDERLYING THE CASE STUDY CCRC

4.1 The projection model is based on a two-step process. In the first step, for each year of the projection the model produces a multistate profile, for each bungalow, of all the individuals who have ever resided in it. The states refer to the individual's state of health and location in the community. In the second step, these bungalow profiles are coalesced into a profile for the entire CCRC, and financial projections are produced from this profile and stated economic parameters.

4.2 The states used by the model are:

- B — in bungalow and in good health;
- BL — in bungalow and receiving care at a low level;
- BM — in bungalow and receiving care at a medium level;
- BH — in bungalow and receiving care at a high level;
- RS — residential care in the care centre — temporary stay;
- RL — residential care in the care centre — permanent stay;
- NS — nursing care in the care centre — temporary stay;
- NL — nursing care in the care centre — permanent stay;
- D — dead or leaving the CCRC because of serious ill health; and
- E — exit other than described in state D.

4.3 There are two versions of the projection model, namely deterministic or stochastic, and results from both approaches are presented in the paper. For every state and year of projection that has a non-zero probability of containing an individual, the model determines the transition probabilities for that year to every other state, dependent on the starting state, the age and sex of the individual, and the state of their partner, if applicable (Cohen *et al.*, 1988b). The development of these transition probabilities is discussed in more detail in Appendix B.

4.4 For each approach, two types of projection are produced by the model:

- (1) a projection of initial members in isolation, similar to the projection of the existing business of an insurance company; and
- (2) a projection with new entrants replacing existing members when accommodation becomes vacant.

4.5 For a single life, permanent transition to the care centre or exit through death or for other reasons results in the bungalow being vacated, and available for resale. For joint lives, both lives must have exited the CCRC or be in long-term care in the care centre before the bungalow is available for resale. The model assumes that there will be a six-month delay in filling any vacancy, to reflect the fact that the prospective member is likely to need to sell a house.

4.6 All future new entrants are assumed to be in state B, and to be older than the original members were at entry. This latter point has been observed in existing CCRCs, and may reflect a tendency for younger couples to be deterred from entering by the higher ages of existing members, thereby leading to an increasing proportion of new entrants being older single females (Winklevoss & Powell, 1984; Cohen *et al.*, 1988a).

4.7 The Trustees intend to operate a waiting list, and the commitment made by the CCRC to prospective members will be that every other vacancy will be filled strictly according to the order on the list. To reflect this and the observation above, the model assumes that the age of future new entrants at entry increases linearly by 8 years over the first 20 years of the projection relative to the entry age of the original members. In addition, the percentage of joint lives as future new entrants is assumed to reduce from 62% to 25% over

the first 10 years of the projection, and to remain constant thereafter. However, management consider that it might be possible to operate the waiting list so as to counter this effect.

4.8 The non-refundable membership fees are derived from the refundable membership fees using the following formulae:

$$F - F\bar{A}_x \quad \text{for single life}$$

$$F - F\bar{A}_{xy} \quad \text{for joint lives}$$

where F is the initial entrance fee on a refundable basis, and x and y are the entry ages of the lives concerned.

4.9 The annual membership fee is set at 7.5% of the refundable membership fee at the time of entry, increasing thereafter at a maximum of RPI plus 3% for both initial and future new members. Increases in annual subscriptions are also subject to a limit of RPI plus 3%.

4.10 In the U.S.A., Type A CCRCs tend to provide more assistance to members in the independent care facilities than the other categories of CCRC. This is a likely explanation for the lower level of care facility usage seen in Type A CCRCs, although this difference may be due to better management or more affluent members in Type A CCRCs (Sloan *et al.*, 1995). The Trustees intend to build on this approach, and control the number of beds utilised by members in the care centre by providing considerable levels of assistance in the bungalows, where required.

4.11 Accordingly, the low, medium and high levels of care referred to in the above discussion of occupancy states are defined by reference to the following numbers of man-hours per week of care provided in the bungalow:

- BL 0-7 hours per week;
- BM 7-14 hours per week; and
- BH 14-21 hours per week.

4.12 The running cost to the CCRC of maintaining a residential bed is assumed to be £12,000 p.a. and that of a nursing bed is assumed to be £13,400 p.a. [In comparing these figures with those quoted in ¶1.4, the location of the Case Study CCRC should be noted, as well as the fact that the figures in ¶1.4 represent charges to residents rather than the cost of delivering care.] These amounts are assumed to inflate with average salary inflation for each subsequent year of projection, and there is an additional staffing cost of £40,000, also inflating with average salary inflation, if any nursing beds are required in the care centre. The projected distribution of all states located in the care centre at the middle of each year is assumed to apply throughout that year.

4.13 Beds in the care centre surplus to the requirements of the members are available for non-members at charge rates of £15,000 p.a. and £20,900 p.a., for residential and nursing care respectively. These figures include a factor of 96%,

to reflect the effect that likely delays in filling available beds will have in reducing annual revenue from this source.

4.14 The allowance for major repairs to the entire CCRC is 1.75% p.a. of the insurable value of all the bungalows as at the start of that year. The cost of minor repairs is included in the allowance for non-care costs. In the projections this allowance was treated as an item of outgo each year; however, in practice this amount would be accumulated to meet the expenditure when it fell due.

4.15 Under the projections for initial members only, the underlying amounts of major repairs and non-care costs before inflation reduce in line with the proportion of the bungalows occupied and with the number of members, respectively, to reflect the level of expenditure that should be assigned to the initial members.

4.16 For the projections for initial members only, it is assumed that when each bungalow is vacated, an amount equal to the refundable initial fee at that time is paid to the CCRC to reflect the fact that the value of the bungalow has reverted to the CCRC.

4.17 For the projections with future new entrants, the reversionary value of the bungalow at the end of the projection term is taken to be equal to the projected value of the bungalow on a refundable basis at that time, multiplied by an assurance factor at an interest rate equal to the excess of the discount rate over the property price inflation rate. For members on a refundable basis, this is reduced by an amount equal to the refundable membership fee paid on entry, multiplied by an assurance factor valued on the discount rate alone.

4.18 RPI is assumed to be 3.5% p.a. Property price inflation and insurance value inflation are taken to be $RPI + 2.0\%$. Average earnings inflation is taken to be $RPI + 1.75\%$, and interest is payable on the loans at a rate of 8.0% p.a.

4.19 All cash flows are discounted from the assumed time of payment to the start of the projection, at a discount rate of 8.0% p.a.

4.20 Further details concerning the assumptions in the projection model are set out in Appendix A.

5. RESULTS OF THE PROJECTION MODEL FOR THE CASE STUDY CCRC

5.1 The present value of the Case Study CCRC is taken to be the sum of the discounted cash flows over a 30-year projection and the initial value of both the communal facilities and the land underlying the CCRC.

5.2 Tables 5.1 and 5.2 demonstrate that the value of the Case Study CCRC is sensitive to property inflation and escalating healthcare costs. The former effect is as a result of the Case Study CCRC paying the initial membership fee in nominal terms to the member or his estate on exit, rather than an amount based on the current value of the bungalow. Provided that the rate at which healthcare costs increases can be contained within a cap of $RPI + 3\%$, the effect on the value of the Case Study CCRC is relatively minor.

Table 5.1. Present value of CCRC on deterministic non-replacement model

Description of scenario	Present value (£m)	Change compared to results on central basis
Central basis	3.96	N/A
Property inflation @ 0%	0.04	(3.92)
Salary inflation @ RPI + 3%, matched by subscription inflation	3.65	(0.31)
Salary inflation @ RPI + 5%, subscription inflation @ RPI + 3%	1.29	(2.67)
Mortality rating of 0 years	4.78	0.82
Mortality rating of -5 years	3.24	(0.72)

Table 5.2. Present value of CCRC on deterministic replacement model

Description of scenario	Present value (£m)	Change compared to results on central basis
Central basis	8.68	N/A
Property inflation @ 0%	(0.12)	(8.80)
Salary inflation @ RPI + 3%, matched by subscription inflation	8.66	(0.02)
Salary inflation @ RPI + 5%, subscription inflation + RPI + 3%	2.33	(6.35)
Mortality rating of 0 years	10.76	2.08
Mortality rating of -5 years	7.19	(1.49)

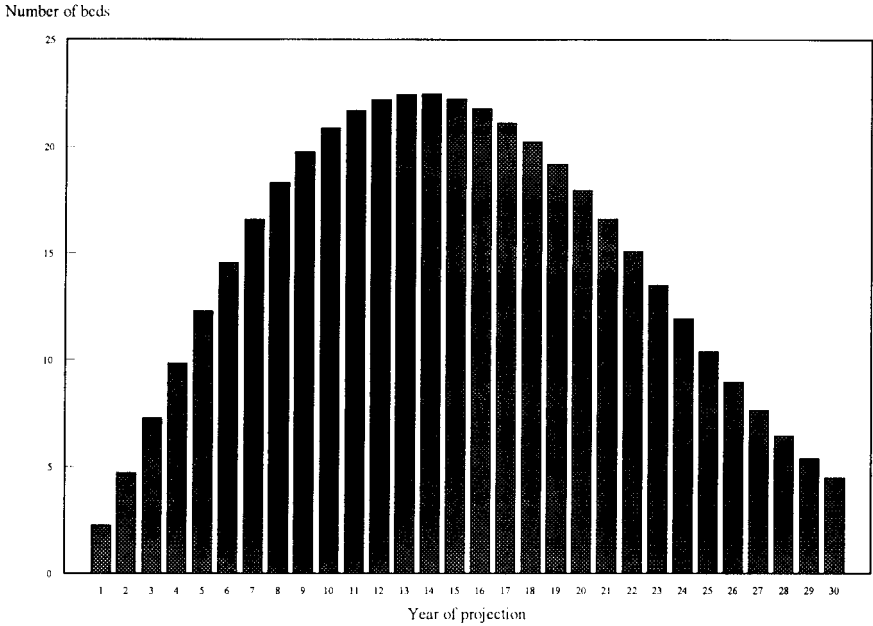


Figure 5.1. Usage of care centre by members: deterministic non-replacement model: central basis

5.3 Figure 5.1 indicates that the maximum theoretical usage of the care centre by members on the central basis is 22.5 beds, and this occurs in year 14 of the projection. The initial members are all assumed to be relatively healthy at entry, and this explains the rising demand in the first 13 years of the projection. The decline in usage at later years of the projection is caused by reducing numbers of members in the CCRC.

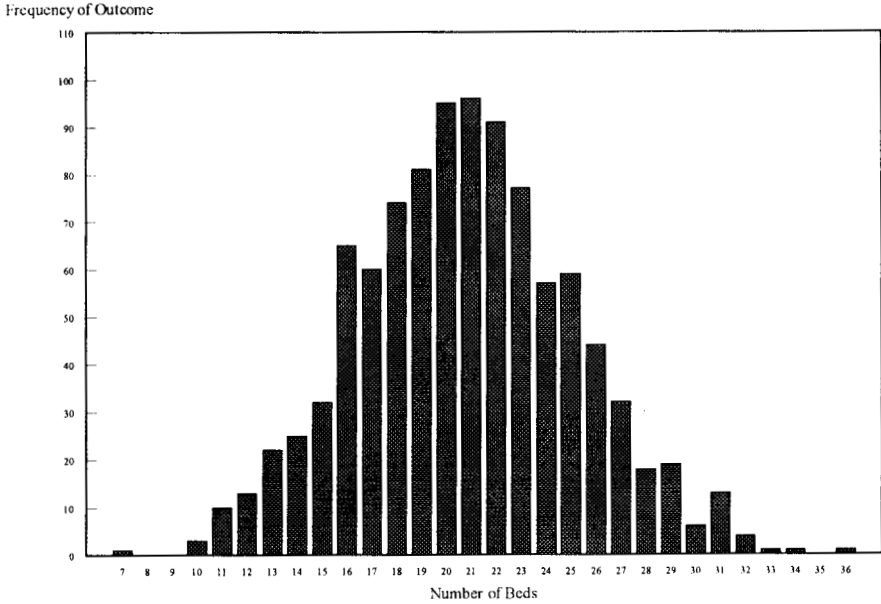


Figure 5.2. Usage of care centre by members in year 10 of projection: stochastic non-replacement model: central basis

5.4 Figure 5.2 shows results from 1000 stochastic runs on the central basis. The median number of beds required by members in year 10 of the projection is 21, and the interquartile range is 6.

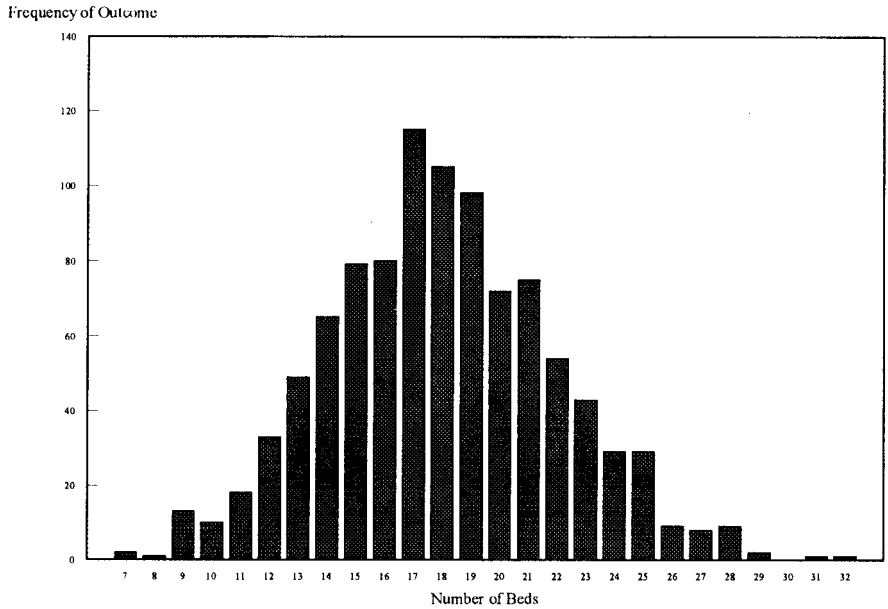


Figure 5.3. Usage of care centre by members in year 20 of projection: stochastic non-replacement model: central basis

5.5 Figure 5.3 shows results from 1000 stochastic runs on the central basis. The median number of beds required by members in year 20 of the projection is 18, and the interquartile range is 6.

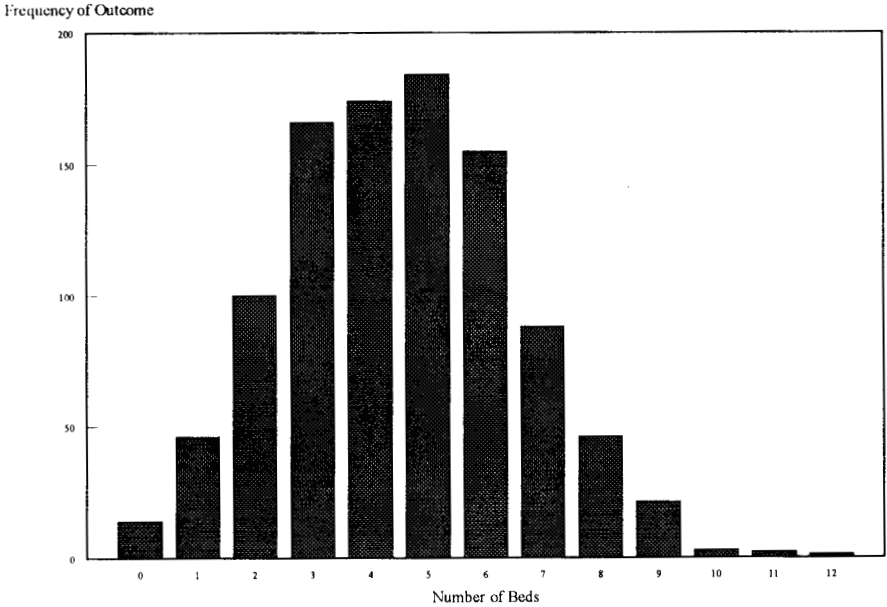


Figure 5.4. Usage of care centre by members in year 30 of projection: stochastic non-replacement model: central basis

5.6 Figure 5.4 shows results from 1000 stochastic runs on the central basis. The median number of beds required by members in year 30 of the projection is 5, and the interquartile range is 3.

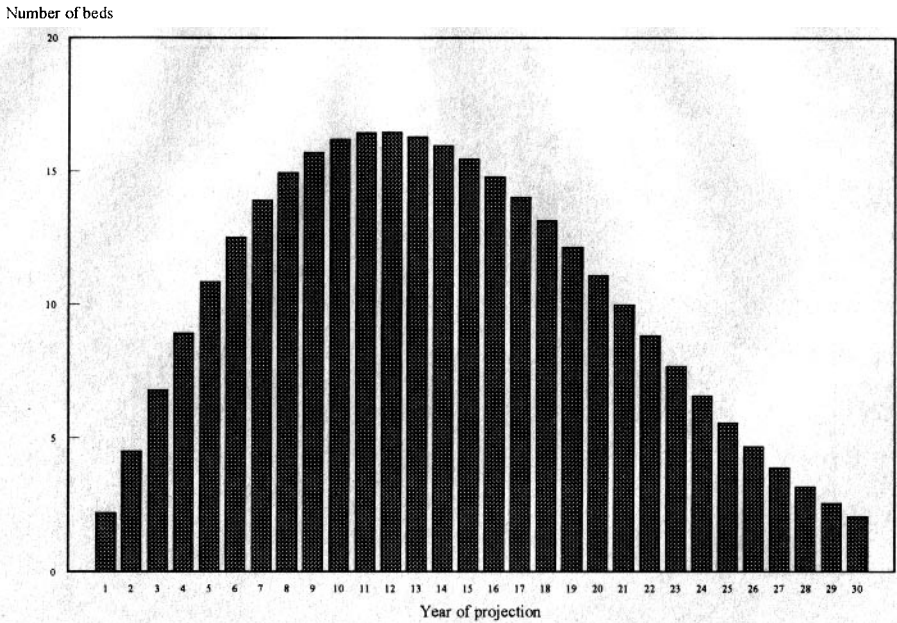


Figure 5.5. Usage of care centre by members: deterministic non-replacement model: mortality rating of 0 years

5.7 Figure 5.5 indicates that the maximum theoretical usage of the care centre by members is 16.5 beds on an increased mortality basis, and this occurs in year 12 of the projection. The number of beds required in each year of the projection is less than that on the central basis.

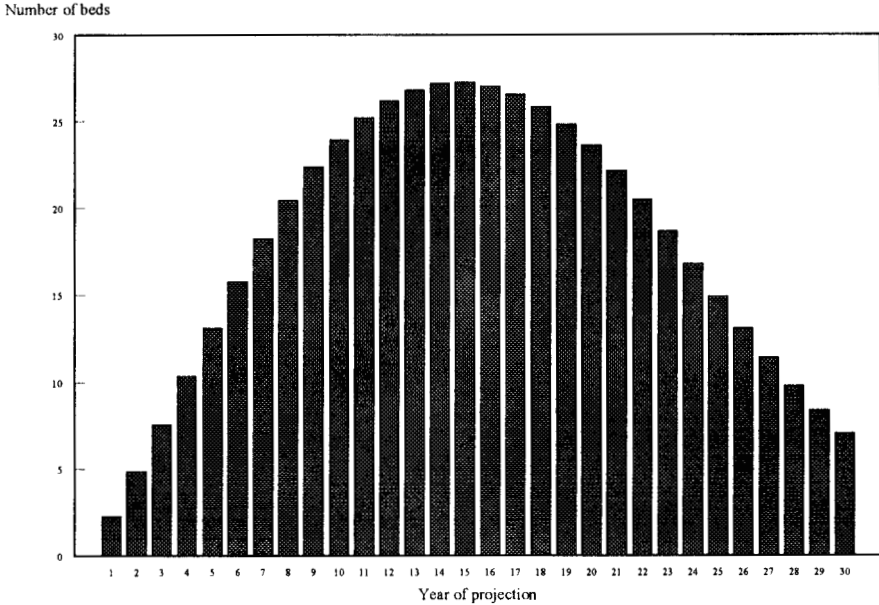


Figure 5.6. Usage of care centre by members: deterministic non-replacement model: mortality rating of -5 years

5.8 Figure 5.6 indicates that the maximum theoretical usage of the care centre by members is 27.3 beds on a reduced mortality basis, and this occurs in year 15 of the projection. The number of beds required in each year of the projection is more than that on the central basis.

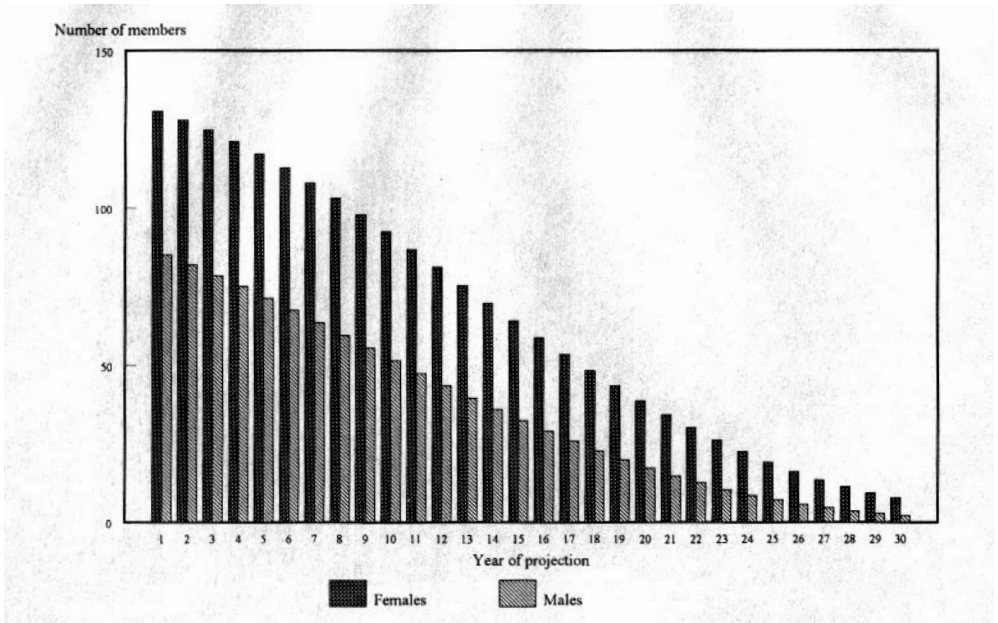


Figure 5.7. Composition by sex of the CCRC: deterministic non-replacement model: central basis

5.9 Figure 5.7 indicates that the proportion of females in the population of the CCRC at the start of the projection is 60%; at 10 years is 64%; at 20 years is 69%: and at the end of the projection is 79%. As the average age at entry of both males and females is 75, this is solely as a result of the greater longevity of females.

Number of beds

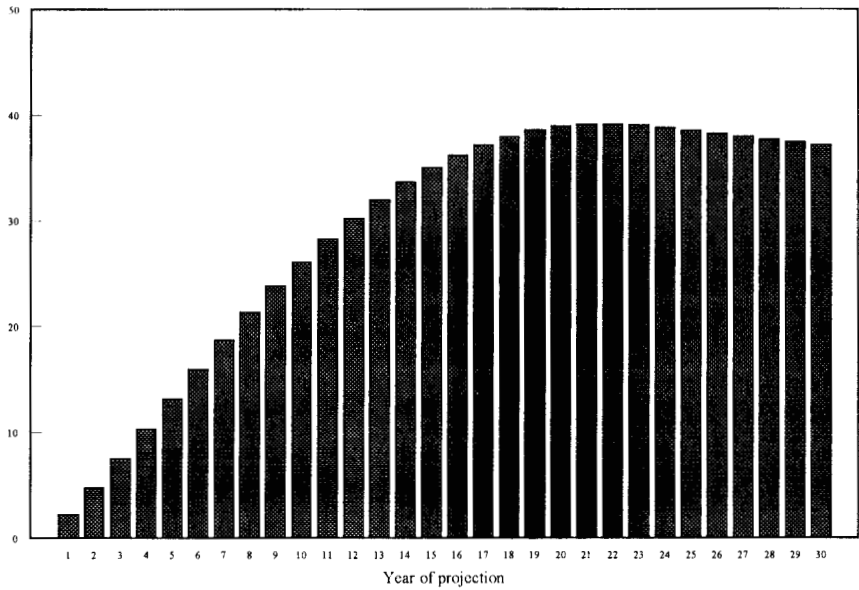


Figure 5.8. Usage of care centre by members: deterministic replacement model: central basis

5.10 Figure 5.8 indicates that the maximum theoretical usage of the care centre by members on the central basis is 39.2 beds, and this occurs in year 22 of the projection.

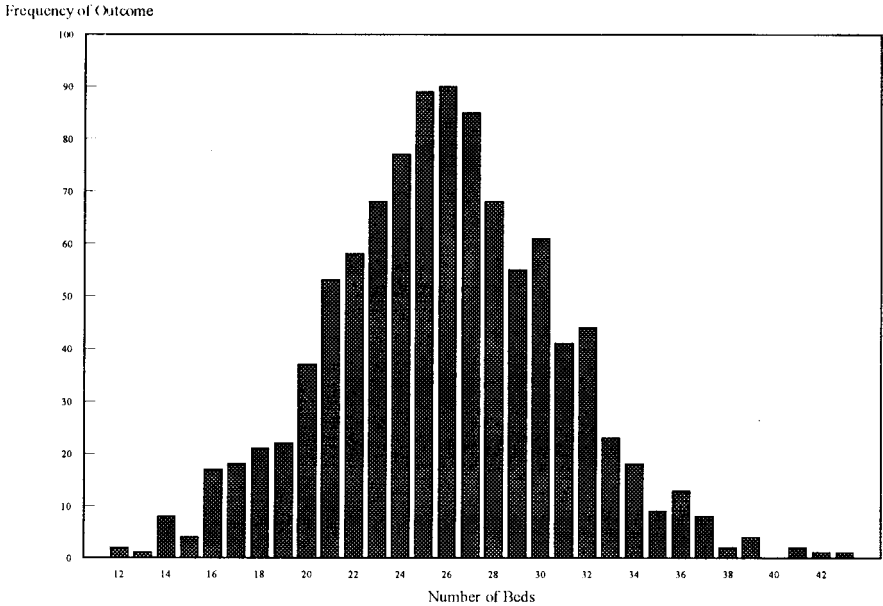


Figure 5.9. Usage of care centre by members in year 10 of projection: stochastic replacement model: central basis

5.11 Figure 5.9 shows results from 1000 stochastic runs on the central basis. The median number of beds required by members in year 10 of the projection is 26, and the interquartile range is 6. The probability that more than 41 beds are required at that time is 0.002.

Frequency of Outcome

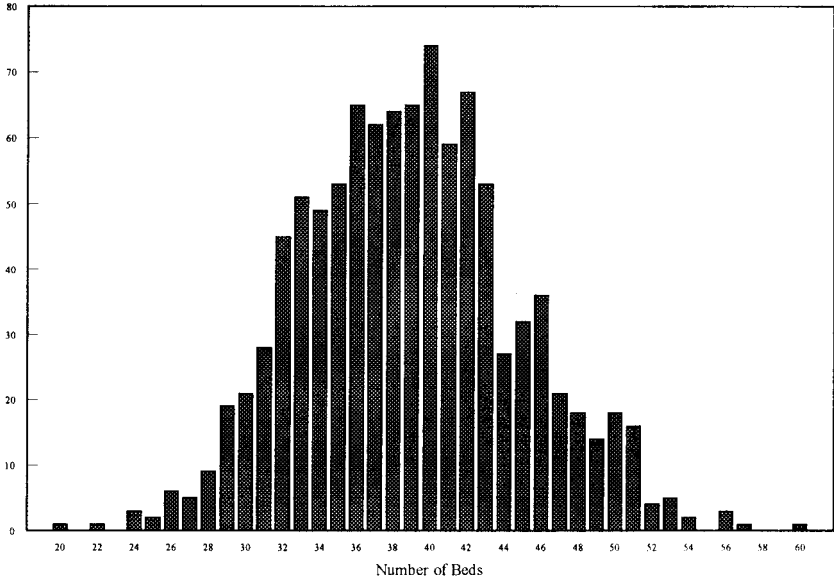


Figure 5.10. Usage of care centre by members in year 20 of projection: stochastic replacement model: central basis

5.12 Figure 5.10 shows results from 1000 stochastic runs on the central basis. The median number of beds required by members in year 20 of the projection is 39, and the interquartile range is 8. The probability that more than 41 beds are required at that time is 0.318.

Frequency of Outcome

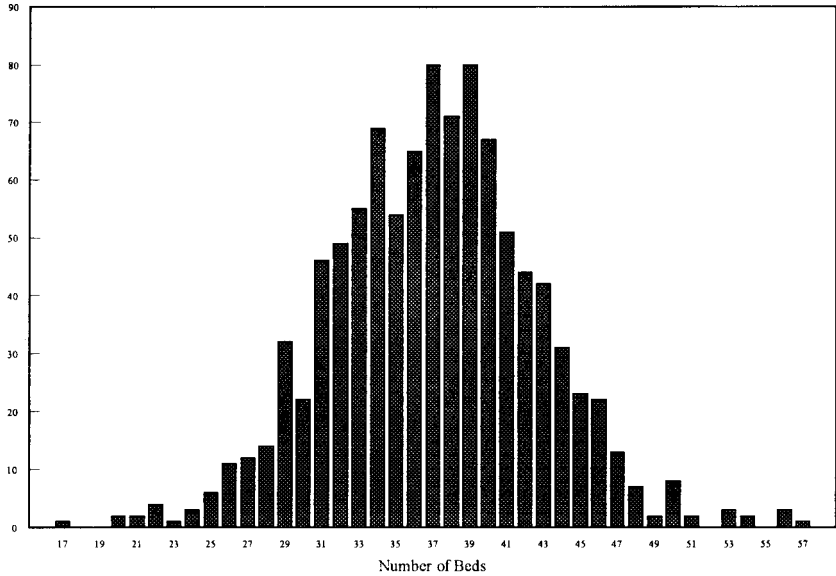


Figure 5.11. Usage of care centre by members in year 30 of projection: stochastic replacement model: central basis

5.13 Figure 5.11 shows results from 1000 stochastic runs on the central basis. The median number of beds required by members in year 30 of the projection is 37, and the interquartile range is 8. The probability that more than 41 beds are required at that time is 0.203.

Number of beds

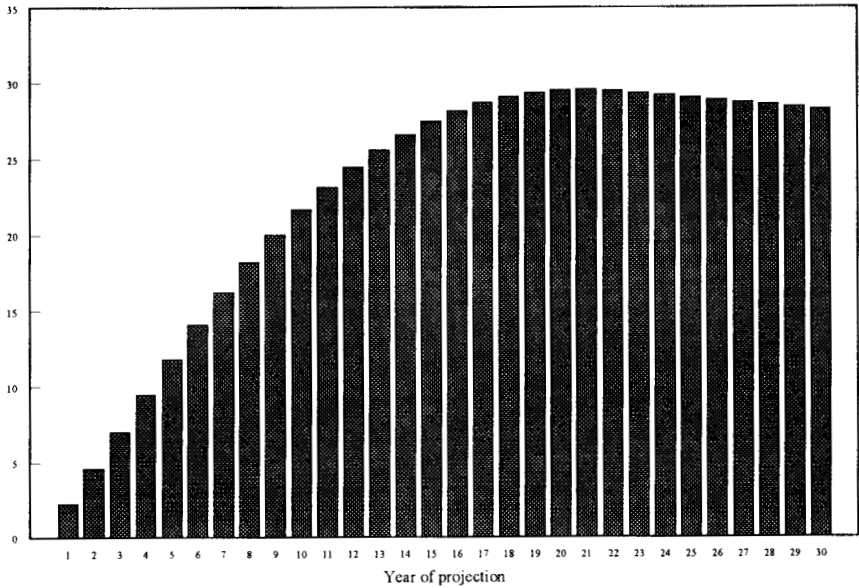


Figure 5.12. Usage of care centre by members: deterministic replacement model: mortality rating of 0 years

5.14 Figure 5.12 indicates that the maximum theoretical usage of the care centre by members is 29.5 beds on an increased mortality basis, and this occurs in year 21 of the projection. The number of beds required in each year of the projection is less than that on the central basis.

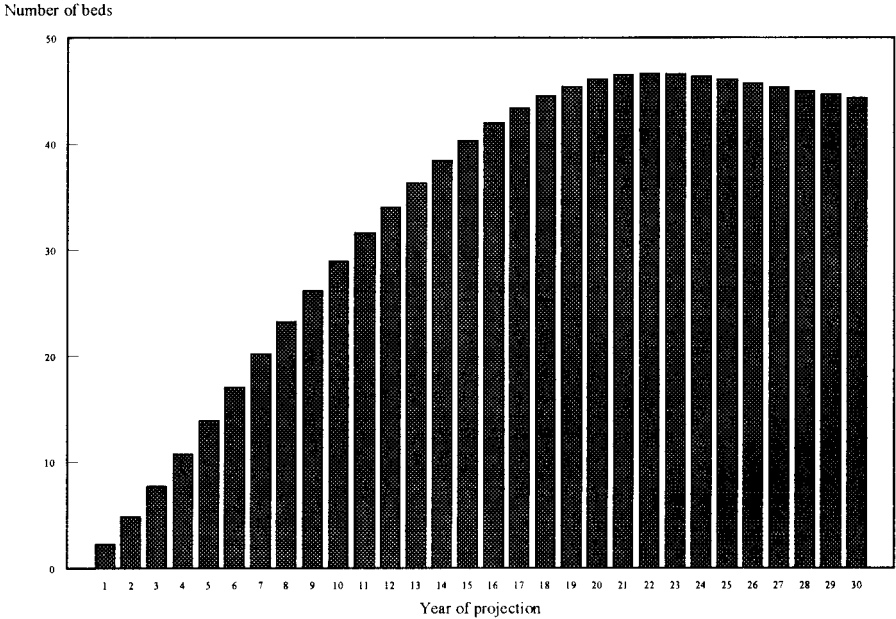


Figure 5.13. Usage of care centre by members: deterministic replacement model: mortality rating of -5 years

5.15 Figure 5.13 indicates that the maximum theoretical usage by members of the care centre is 46.7 beds on a reduced mortality basis, and this occurs in year 22 of the projection. The number of beds required in each year of the projection is more than that on the central basis.

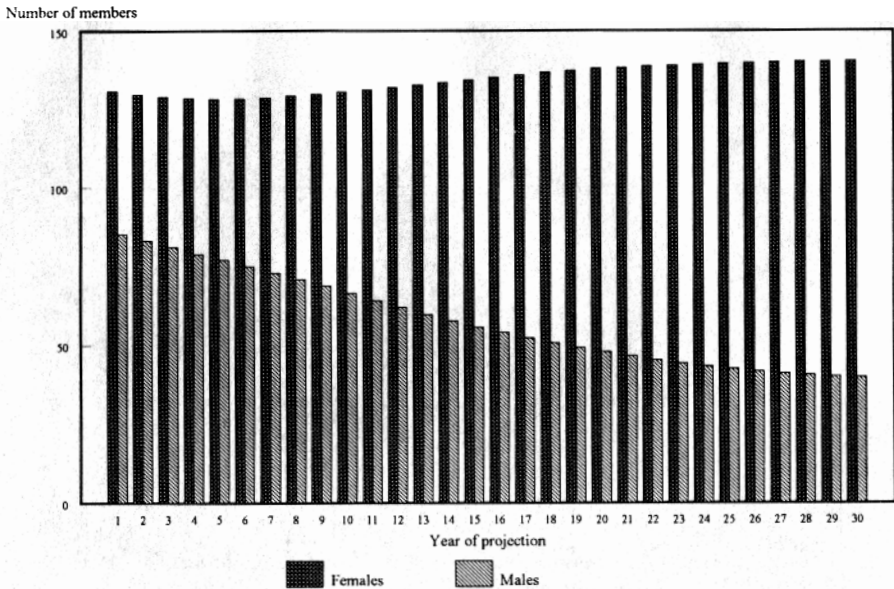


Figure 5.14. Composition by sex of the CCRC: deterministic replacement model: central basis

5.16 Figure 5.14 indicates that the proportion of females in the population of the CCRC at the start of the projection is 60%; at 10 years is 66%; at 20 years is 74%; and at the end of the projection is 78%. The change is more rapid in the early years of the projection as compared with the non-replacement model, and this is because a proportion of the initial members who entered as couples are replaced on their exit by single females.

6. CONTROL OF RISKS FOR DIFFERENT CCRC OPERATORS

6.1 *Potential Operators*

6.1.1 The financial structure described in Sections 3 and 4 and Appendix A, in respect of the Case Study CCRC, may be appropriate to a large charity. However, it involves significant uncertainty of financial outcome in the short to medium term, and indeed in the longer term. As such, it is unlikely to meet the profit and risk requirements of a commercial organisation.

6.1.2 There may, however, be attractive opportunities for commercial organisations to run CCRCs, particularly those targeted at individuals or couples with substantial income or capital. However, commercial CCRC operators are likely to want a high degree of control of risk and an early and predictable flow

of profits. [There may well be other non-profit organisations interested in developing CCRCs in the U.K., but, in order to emphasise the major issues presented by CCRCs, we have concentrated in this paper on the requirements of a profit-making organisation.]

6.1.3 Studies into the profitability of CCRCs in the U.S.A. have concluded that the return on capital achieved in the past was below comparable establishments, and below that which a typical commercial organisation would regard as acceptable.

Table 6.1. Profitability of CCRCs versus other service industries (Conover & Sloan, 1995)

Measure of profitability	CCRCs	Hospitals	Skilled nursing homes	Residential homes
	%	%	%	%
Return on assets	(1.9)	3.7	3.0	2.8
Return on equity	(3.0)	7.7	9.9	6.0
Return on sales	(7.5)	1.9	2.7	2.9

Note: The average profitability of Type A CCRCs is lower under all measures than that of Type C.

6.1.4 However, many CCRCs in the U.S.A. are non-profit organisations, and the negative returns shown in Table 6.1 may reflect the reluctance of directors to raise subscriptions to profitable levels (Ruchlin, 1988). Despite this, a fundamental question still remains as to whether the charges necessary to provide an adequate return on capital in a CCRC would simply make a CCRC ‘too expensive’ to be a viable proposition.

6.1.5 If this were the case, CCRCs would be limited to charitable organisations, and hence few CCRCs would be constructed in the U.K. However, given the appeal of the concept to many elderly people, and the increasing numbers of relatively affluent elderly, it should, in the authors’ view, be possible to construct a charging structure which would attract sufficient numbers of potential members to make a commercially viable community.

6.1.6 In addressing the question of who this commercial organisation might be, it is clear that there are three distinct roles within a CCRC. A property developer will be needed to construct the bungalows and the communal facilities. An operator will be required to run the CCRC, including the care centre, and, where appropriate, to provide assistance in the bungalows. Finally, an insurer may be closely involved with the operator in underwriting the long-term care risks of the CCRC. It may be that more than one of these roles are undertaken by the same commercial organisation, but the profits and risks involved in each are quite distinct.

6.1.7 For the property developer, the construction of the CCRC and of a large hotel complex do not present fundamentally different challenges. For the insurer, we explore the problems that the CCRC presents in Section 8.

6.1.8 However, for the operator, the CCRC is much more than just a nursing home parcelled together with sheltered accommodation. The main difference lies in the commitment to the members to meet their long-term care needs and to meet their reasonable expectations for non-care services. This entails significant risk, and it is reasonable for the operator to receive a commensurate level of profit. Over the following sections we discuss a commercial CCRC from the point of view of the operator.

6.1.9 CCRCs, like other organisations, are subject to two types of risk from an actuarial perspective:

- (1) economic and demographic risks (which can be subject to actuarial investigation); and
- (2) management risks.

6.1.10 In the following sections we will study how the following three potential operators are affected by such risks:

- (1) the Case Study CCRC, in full knowledge of the risks, but having regard to its considerable financial resources;
- (2) a hypothetical CCRC, XYZ, established and managed without actuarial advice and based in concept on the experience of CCRCs in the U.S.A. that ran into financial difficulties in the 1970s; and
- (3) a hypothetical Commercial CCRC.

6.2 *Economic and Demographic Risks*

6.2.1 *Property inflation — or the lack of it*

6.2.1.1 In the Case Study CCRC, the land underlying the bungalows is regarded as a long-term asset of the CCRC, whose value can be regarded as providing a contingency reserve. However, the value of this asset in times of difficulty for the CCRC would depend on the nature of the difficulties encountered. If the CCRC was unable to attract new members on terms which would cover expected costs, selling the bungalows as freehold could give the land significant value. However, if the intention were to remain as a going concern, the value of the land could be considerably less.

6.2.1.2 For the Commercial CCRC, the land underlying the bungalows would have to be purchased. This could be financed by means of a long-term fixed interest rate mortgage, with the annual payment of interest and capital met from members' annual fees.

6.2.1.3 As regards the construction costs of the bungalows for the Case Study CCRC, the CCRC broadly recovers the cost of construction through the refundable initial membership fee. The member is paid the amount of the initial membership fee in nominal terms on death or departure from the CCRC. Hence, the CCRC generates surplus from property inflation. However, there is no charge for major repairs in the fees paid by the member. The cost of major repairs is, in effect, paid for by means of property inflation, and any excess passes directly to the surplus of the CCRC, and any deficiency is a source of deficit to the CCRC.

Moreover, if real property inflation is negative, the necessity to return the initial membership fee in nominal terms may lead to losses of itself, even before the cost of providing for major repairs. The acceptance of this exposure to property price inflation reflects the position of the Case Study CCRC as part of a large charity with substantial assets, together with a view that in the long term positive nominal property inflation is likely.

6.2.1.4 The commercial operator will similarly seek to cover construction costs with the initial membership fee, and, by basing the refund to the member or his or her estate on the market value of the bungalow at that time, the Commercial CCRC will be largely insulated from future movements in market values of residential property, in general, and that of the CCRC, in particular. However, this insulation means that, if property inflation were to be consistently high, the Commercial CCRC would gain no direct benefit, unlike the Case Study CCRC, which would benefit from high capital gains on members leaving the bungalows.

6.2.1.5 The Commercial CCRC is likely to pass the costs of major repairs directly onto the member, by including an allowance for this in the annual fee.

6.2.1.6 In the case of the XYZ CCRC, a substantial part of the initial membership fees was used to repay construction loans as soon as possible, and, as such, was invested in the property of the CCRC. The charge for future costs contained within the initial membership fees was inadequate, as described in Section 2.1. Hence, the ability of XYZ CCRC to pay for future care costs required an exceptionally high level of investment return from property as a going concern CCRC, together with a mechanism for releasing this value to pay for care.

6.2.1.7 For both the Case Study CCRC and the Commercial CCRC, ownership of the communal facilities, including the underlying land, needs to be retained to guarantee that long-term care needs will continue to be met. Hence, the communal facilities represent an asset which is sensitive to property inflation under both scenarios. If the CCRC was forced to close down, the communal facilities may have significant value in themselves, but this would have to be set against the cost to the CCRC of discharging its obligations to existing members.

6.2.1.8 Although insulated from the effects of residential property inflation, the commercial operator is likely to need to exercise some control over the entry of new members, and to avoid the former members' beneficiaries being able to negotiate direct with prospective new members. This is reinforced by the need to maintain a standard of health requirements and to manage the age profile of the CCRC. Hence, the operator is likely to structure its contract with the member so that the operator has a 'first refusal' clause with regards to the sale of the bungalow.

6.2.2 *Non-care services*

6.2.2.1 The CCRC will typically provide a range of non-care services, such as repair, maintenance and operation of the communal facilities other than the

care centre, external decoration of the independent living units, and so on. The approaches of the Case Study CCRC, the XYZ CCRC and the Commercial CCRC in respect of non-care services are fundamentally similar, in that services would be charged for by an ongoing service fee levied on members irrespective of age or sex.

6.2.2.2 The difference between the Case Study CCRC and the Commercial CCRC is that the former will have made it clear to members that the charge will rise by no more than RPI + 3%, whereas the latter will not wish to constrain its ability to increase service charges above the rate of average earnings inflation, if this should prove to be necessary.

6.2.2.3 There are, however, some grey areas in respect of these services and the state of health of members. For example, in the case the Case Study CCRC, members in independent living units will be expected to maintain the small area of lawn or garden adjacent to their bungalow. If, however, they are unable to do so for health reasons, the CCRC will carry out this function at no additional charge.

6.2.2.4 From a theoretical point of view, the commercial operator could include the costs of such services in the care costs and in the allowance for cost of care. However, this gives a misleading impression of precision in estimating the need for care. It is important that management, actuaries and sponsors are fully aware of the inevitable uncertainty of estimates of future care needs, and implement appropriate management policies and charging structures to deal with this.

6.2.3 *Care risks*

6.2.3.1 In the Case Study, the CCRC bears significant risks of meeting the costs of care for its members. Care costs are intended to be covered by an annual charge, and while the CCRC has the right to increase these charges, this is limited by its undertaking to members to limit any increases to no more than RPI +3% p.a. However, although its ability to raise charges is limited, it has considerable flexibility over the manner of care delivery, since the CCRC has been designed to permit a high level of assistance to be delivered to the bungalows.

6.2.3.2 The initial membership fees of the XYZ CCRC were designed to cover most, if not all, of the future care costs. Since the calculations underlying the setting of these charges were based on estimates of mortality that were too high, the fees for care are lower than expected on a realistic basis. If care costs rise at rates above those expected, this would exacerbate the financial difficulties of the CCRC.

6.2.3.3 A commercial operator will be concerned to limit its exposure to care costs. Ideally, it would like to cover costs by annual charges, without a limitation on the ability to increase these charges. However, such a policy may expose a new set of problems, since the members' pensions may not keep pace with price inflation, and hence their ability to pay fees increasing at significantly above RPI may be limited. In addition, even if large increases in charges can be borne by members, they risk souring the relationship between the CCRC and its members.

6.2.3.4 The commercial operator may wish to insure for the costs of long-term care rather than bear these risks. The design and pricing of possible long-term care insurance arrangements for a CCRC are beyond the scope of this paper, but, in Section 8, we examine some likely products and some of the obstacles that the insurer may perceive in offering contracts in the form that the CCRC may require.

6.2.3.5 From the point of view of the commercial operator, it will wish to ensure that any ability on the part of the insurer to increase premiums in the light of adverse experience is constrained in term of period of notice, and that limitations are in place that restrict the rate at which the insurer may increase premiums to less than the maximum rate at which it judges it can increase its charges to members.

6.2.3.6 If the scheme is insured, then the premium for its members could be on a group basis, dependent on the age and sex distribution of members, or on an individual basis, based on age, sex and state of health of the member at entry. The latter approach is likely to lead to a greater stability of charge, as far as the individual member is concerned. An aggregate approach, in which the amount in respect of premiums included in an individual member's annual charge varies with the age/sex distribution of the membership as a whole, could result in variations in an individual's charges resulting from changes in the make-up of the CCRC.

6.3 *Alternative Arrangements and Alternative Risks*

6.3.1 The three sections above have focused on charging from the perspective of the basic attitude and approach to risk in the three CCRCs considered. This does not address how these would be revised in the light of the available amounts of capital and income among prospective members.

6.3.2 *Members with high assets and low income*

6.3.2.1 Members with substantial capital, but relatively low income, could commute the cost of providing long-term care by means of an initial cash payment to the CCRC. This would involve the CCRC in either arranging a single premium long-term care insurance product for the member with an insurer, or effectively writing one itself. In both cases the risks would arise from longevity and high future care costs, with the difference being whether they were borne by the insurer or the CCRC.

6.3.2.2 Having guaranteed future care in return for an initial payment, the CCRC would find it very difficult to ask these members to contribute more if costs were higher than expected. In addition, given that the members concerned had relatively low incomes, they may be unable to pay more. This risk is particularly marked, given the high level of uncertainty about future long-term care costs.

6.3.2.3 The Case Study CCRC is prepared to accept pre-funded contributions up to a maximum of 50% for any member, and will monitor the proportion of fees being commuted, and may decline to admit prospective members wishing to

use this method of payment if, otherwise, too high a proportion of fees would be paid on this basis.

6.3.2.4 The taking of a high level of pre-funded fees was the major risk for the XYZ CCRC, identified earlier. Partly as a result of inadequate allowance for longevity being made, care costs were understated at entry. Even if the initial fee had not been understated, the fact that mortality was overestimated and not monitored would be likely to result in future care costs being underestimated, giving an unduly optimistic view of the CCRC's financial performance.

6.3.2.5 The commercial operator may not want to incur these risks, and hence would not wish to offer this method of payment unless suitable single premium long-term care insurance arrangements are available. Ideally, from the operator's perspective, these should be structured so that all the resulting risk is borne by the insurer and not the CCRC.

6.3.2.6 As regards on-going service fees, capital can be applied to purchase an index-linked life annuity. This would enable the CCRC operator to accept one initial payment instead of ongoing fees for the provision of non-care services. However, this arrangement is likely to involve the CCRC operator in effectively giving a guarantee that future service fees will not rise faster than the index selected. It is quite possible that events outside the control of the CCRC operator, such as changes in accepted standards of general services or in regulations, may lead to costs rising faster than the indexation of the annuity. This could be addressed by using an index with a greater safety margin, such as RPI plus several percent; however, the greater the size of the safety margin, the greater the cost of the annuity to the member.

6.3.3 *Members with high income and low assets*

6.3.3.1 The Case Study CCRC offers membership of the CCRC on a 'rental' basis, with all of the initial membership fee being replaced by an annual charge, payable throughout the duration of membership of the CCRC, irrespective of whether the member is resident in the bungalow or the care centre.

6.3.3.2 A commercial operator may prefer to achieve a speedier payment of the initial membership fee, and may arrange a source of bank finance to be available to members for this purpose, so that the building costs can be recovered with the same speed as for an entrant paying a refundable fee. The member would then be repaying a bank loan.

6.4 *Management Risks*

6.4.1 The three operators will face similar management risks, as discussed below.

6.4.2 *Failure of initial marketing*

Failure to attract sufficient initial members is clearly a risk. This can, however, be reduced by the following measures:

- (1) carrying out appropriate market research to establish that the CCRC would, on the membership terms proposed, be attractive to a sufficiently large number of members, so that the operator can be confident that the CCRC would be fully occupied;
- (2) requiring non-refundable deposits from prospective members prior to commencing construction;
- (3) ensuring that, as a result of pro-active management, the CCRC continues to represent an attractive proposition, which prospective members will be keen to join;
- (4) maintaining a waiting list of members wishing to join the community once places have been fully allocated; and
- (5) requiring a substantial and non-refundable commitment fee from prospective members who are offered immediate membership of the community, but are unable to take this up as a result of delay in releasing funds through the sale of their houses. The commitment fee, less a charge related to the period for which the accommodation remained vacant, could be offset against the initial membership fee when the member was ultimately able to join the community.

6.4.3 *The marketing problem of ageing*

6.4.3.1 A more difficult risk relating to marketing is that the CCRC may fail to attract appropriate second generation members when vacancies arise from members dying or moving into the care centre. Some CCRCs in the U.S.A. have experienced this problem; they may have started with relatively 'young' members, but in later years the average age of members rose significantly. The CCRC was then perceived as consisting of the 'very old', and 'younger' potential members were put off from joining such a community. This, in turn, exacerbated the problem by effectively limiting new entrants to those who were already 'very old',

6.4.3.2 One strategy for dealing with this problem is to limit membership of the community, so as to achieve an age/sex distribution which corresponds to the anticipated ultimate steady state. For this to be a feasible strategy, however, it is necessary for the CCRC to be substantially over subscribed with a wide distribution of age groups amongst applicants without too low (or high) a proportion of married applicants. Attracting the younger cohorts of applicants needed to support such a policy may be difficult. If this were encouraged by pricing to subsidise the charges for younger members, the implications of this policy in the long term would need careful analysis; particularly if a significant proportion of initial entrants would be eligible for subsidy.

6.4.4 *Care delivery*

6.4.4.1 Even if the CCRC were to obtain comprehensive and guaranteed terms for a long-term care insurance policy, the responsibility for the delivery of the care would remain with the CCRC. For example, the care centre of the Case

Study CCRC contains 41 beds. If the number of members requiring nursing or residential care exceeds this number of beds, the CCRC is left with the problem of managing this situation, even if the insurance policy is paying for the required (rather than the actual) number of residential or nursing care places. Possible solutions to this particular problem include:

- (1) designing the CCRC so that the care centre is so large that some non-members will always be required to fill it. This may also be achieved by making the care centre sufficiently flexible in design so that further bed areas can be created; and
- (2) increasing the level of assistance to the bungalows, so that only the most serious cases need to be in the care centre.

6.4.4.2 In any case, during the initial years of the CCRC the care centre will be largely filled by non-members, as members are expected to be relatively fit on initial entry.

6.4.4.3 The estimation of the number of beds required by the CCRC illustrates the fact that actuarial projections can play a valuable role in providing input to the design, as well as the finances, of a CCRC.

7. RESULTS OF THE PROJECTION MODEL FOR A COMMERCIAL CCRC

7.1 To produce financial projections for a Commercial CCRC, a number of the assumptions used in the model described in Section 4 need to be modified. The main changes are listed below, and further details can be found in Appendix A:

- (1) The operator is assumed to have committed £3.7 million of capital to the purchase of the land underlying the CCRC and £1.3 million of capital to the construction costs of the CCRC. Additional loans to the amount of £12.4 million have been secured to cover the remainder of the construction costs.
- (2) These loans are assumed to be repaid over a 30-year period through charges levied on the members. On the initial members only projection, the aggregate amounts of these charges are assumed to reduce in line with the number of members in the CCRC.
- (3) The cost of major repairs is met by explicit charges on the members.
- (4) In deriving premiums for the long-term care insurance contracts, it is assumed that both the insurer and the CCRC have each added a profit loading of 10% onto the actual cost of delivering care, as both are assumed to be profit-making organisations.
- (5) All members effectively enter on a refundable membership fee.
- (6) Refunds are based on the market value of the bungalow at the time of death, exit or transfer to the care centre, and not on the nominal value of the initial membership fee.

- (7) Interest is payable on the loans at a rate of 9.5% p.a., and all cash flows are discounted from the assumed time of payment to the start of the projection at a discount rate of 11.0% p.a.

7.2 The present value of the Commercial CCRC is taken to be the sum of the discounted cash flows from a 30-year projection and the initial value of both the communal facilities and the land underlying the CCRC.

7.3 Tables 7.1 and 7.2 demonstrate that, as a result of the charging structure described in ¶7.1, the value of the Commercial CCRC is significantly less sensitive to property inflation and escalating healthcare costs than that of the Case Study CCRC.

Table 7.1. Present value of CCRC on non-replacement model

Description of scenario	Present value (£m)	Change to central basis
Central basis	8.19	
Property inflation @ 0%	8.02	(0.17)
Salary inflation @ RPI + 3%, matched by subscription inflation	8.43	0.24
Salary inflation @ RPI + 5%, matched by subscription inflation	8.89	0.70
Mortality rating of 0 years	7.98	(0.36)
Mortality rating of -5 years	8.30	0.11

Table 7.2. Present value of CCRC on replacement model

Description of scenario	Present value (£m)	Change to central basis
Central basis	8.55	N/A
Property inflation @ 0%	8.51	(0.04)
Salary inflation @ RPI + 3%, matched by subscription inflation	8.93	0.38
Salary inflation @ RPI + 5%, matched by subscription inflation	9.72	1.17
Mortality rating of 0 years	8.58	0.03
Mortality rating of -5 years	8.49	(0.06)

8. THE ROLE OF LONG-TERM CARE INSURANCE IN A CCRC

8.1 Whether long-term care insurance would be available to CCRCs, and, if so, the extent to which it could match the CCRCs' risks, is not yet clear. There are a number of long-term insurance products on the U.K. market which may be relevant, with considerable variation in contract definitions. However, long-term care insurance is not the main focus of this paper, and hence we only discuss the products in outline. The characteristics of three categories of contract are set out overleaf:

- (1) *Regular premium long-term care insurance.* These contracts are normally effected by people in relatively good health. Entitlement to benefit is generally dependent on an inability to perform a defined number of activities of daily living (ADLs). Benefits typically consist of either defined monthly payments or the provision of care up to a defined maximum monthly cost. A number of contracts vary the benefits with the degree of disability, so that, for example, half of the maximum benefit is paid on failure to perform 3 out of 6 ADLs, and the full benefit paid on failure to perform 4 out of 6 ADLs. Premiums vary by age, sex and state of health.
- (2) *Single premium long-term care insurance.* This contract is essentially a single premium version of the annual premium contract described above.
- (3) *Ill-health (or individually underwritten) annuity.* This contract is typically sold to those already in need of long-term care, and may be used to convert the capital sum released on the sale of a house into a life annuity to pay nursing home fees. As the contract is individually underwritten, if the annuitant's life expectancy is reduced as the result of a medical condition, the amount of the annuity should be correspondingly greater than the standard annuity rate for that age and sex.

8.2 These contracts are likely to be used by the CCRC in the following ways:

- (1) *Regular premium long-term care insurance.* This fits well with the concept of annual charges to cover care costs. The insurance could be established on a group basis, with premiums paid by the CCRC from annual charges made to members. Alternatively, premiums could be paid directly by members to the insurance company, which would then pay benefits either to the CCRC or to the member. In the absence of clear advantages for this latter approach, the CCRC and the insurer are likely to prefer the group approach, and thereby avoid the problems associated with members allowing their individual contracts to lapse.
- (2) *Single premium long-term care insurance.* This would be suitable for members commuting part or all of their future care costs by payment of a capital sum on entry. The issues are similar to those for annual premium long-term care insurance, subject to any differences arising from, for example, taxation.
- (3) *Ill-health retirement annuity.* This may be relevant to situations in which one partner of a couple does not satisfy the medical entry requirements. The member meeting the requirements would enter on normal terms, but the cost of care to the member failing the requirements would be met by the annuity.

8.3 From the point of view of the CCRC, for insurance to be effective, it must be closely tailored to the needs of the CCRC. From the point of view of the insurer, a number of fundamental problems regarding the use of the insurance need to be addressed, for example:

- (1) *The definition of level of care.* As noted above, long-term care insurance is often based on specific medical definitions of disability, such as inability to perform ADLs. In the context of a CCRC, however, the need to transfer a disabled person from an independent living unit to residential care will depend on other factors; in particular, whether a spouse is able to meet some of the needs of the disabled member. There may, therefore, be difficulty in finding a definition of disability that meets the needs of both the CCRC and insurer.
- (2) *Concentration of risk.* Writing long-term care insurance on several hundred people in one community, subject to management by one operator, whose actions may affect the level of care required, may represent an unacceptable concentration of risk to the insurer.
- (3) *Guarantee versus management.* From the commercial operator's perspective, the objective would naturally be to secure insurance on fully guaranteed terms. The insurer may, however, normally offer full guaranteed terms only on the basis that it organises the delivery of appropriate care. This would not be practical in the context of a CCRC. The Case Study CCRC, with its emphasis on the ability of the operator to manage bed occupancy in the care centre through varying the level of care provided in the bungalows, illustrates this point.
- (4) *The inflation risk.* While an insurer may be prepared to offer a contract with benefits and premiums increasing at a stated percentage, an RPI-linked contract is less likely to be offered, and, if offered, is likely to have significantly higher premiums.

8.4 However, it is our view that these problems are not so intractable as to be obviously beyond solution. If a solution can be found, however, it will require a considerable amount of flexibility and trust on both sides, and an element of profit sharing, together with consultation over methods of delivering care, may be needed for agreement to be reached.

9. MORTALITY AND MORBIDITY ASSUMPTIONS FOR A CCRC

9.1 *Measures of Mortality and Disability*

9.1.1 As mentioned previously, members of CCRCs tend to be drawn from the higher socio-economic groups, and, as such, their expected mortality is, on average, lighter than that of the general population. Given the small size of each CCRC, and the absence of collated data on mortality rates for comparable CCRCs, annuitant mortality is often used, with adjustments to account for possible future improvements (Winklevoss & Powell, 1984).

9.1.2 In practice, decisions concerning transitions in the CCRC will be taken on the basis of overall morbidity, rather than on failure to complete a small number of tasks. Unfortunately, the sheer variety of possible medical conditions make modelling based on specific conditions impractical. However, if the effect

of morbidity is classed in terms of degrees of functional impairment, it becomes possible indirectly to model the impact of a multitude of conditions on the individual.

9.1.3 CCRCs are too small to develop useful longitudinal analyses of disability transitions, and differences in management policy regarding transfer to the care centre would result in pooled data, if available, being difficult to interpret.

9.1.4 In terms of general population studies, the National Long Term Care Surveys in the U.S.A. provide a wide database for charting disability prevalence. In particular, the surveys of 1982 and 1984 represent a sufficiently short intersampling period to enable useful conclusions to be made concerning transitions between states of disability (Manton, 1988).

9.1.5 The surveys measure functional impairment in terms of ADLs. ADLs (see Katz & Akpom, 1976) consist of a set of six tasks deemed essential to independent living. Using observations from child development studies and of recovery patterns in disabled patients, it is evident that the order in which these tasks are first mastered is the same in the two studies, and that the order is determined by the inherent complexity of the task. Therefore, the number of ADL impairments, by itself, not only provides information as to the degree of disability, but also allows collation of disability data across a population. Descriptions of the ADLs can be found in Appendix B.

9.1.6 Through understanding the types of tasks that the individual finds difficult, the CCRC can more accurately project the level and type of care required by each individual. In practice, developing a more detailed profile of an individual's capabilities will assist in this process. This may involve assessments of cognitive function and of the more complex instrumental activities of daily living, but, at the present time, transition data on these measures are very limited (Manton *et al.*, 1995a).

9.2 *Interrelationship between Mortality, Morbidity and Disability*

9.2.1 In the elderly, chronic disability is caused by the physiological effects of old age and by the interaction of multiple disease processes (Manton *et al.*, 1997a). The relative importance of these two contributions is highlighted by the observation that, in the years before death, those dying at older ages show an increased level of chronic disability, but no change in the number of medical conditions as compared with those dying earlier (Guralnik *et al.*, 1991). However, if a comparison is made between survivors and deceased at any age, the deceased show higher morbidity and disability rates, confirming the high correlation between increased chronic disability and higher mortality rates found in other studies (Donaldson *et al.*, 1980; Booth *et al.*, 1983; Campbell *et al.*, 1985). See Table 9.1.

9.2.2 At all ages the prevalence of disability is greater amongst females than males (Guralnik *et al.*, 1991). However, the incidence of disability is lower. This apparent contradiction is explained by a higher probability of survival for females

at all levels of disability, and a lower probability of transferring to higher levels of disability. This appears to be a consequence of their particular pattern of morbidity, with disability in females following from less lethal conditions, such as osteoporosis and osteoarthritis, than those in males, such as ischaemic heart disease (Manton, 1988; Manton *et al.*, 1995d).

9.2.3 This clearly demonstrates the importance of sex-specific transition rates in modelling elderly populations. It also suggests that patterns of required support are strongly differentiated by sex, with a tendency for males to need intensive care for short periods of time, and females to need a lower level of care for considerably longer periods. This has clear implications for the delivery of care in the future, and with escalating overall costs, the benefits of the care provided need to be monitored closely. For example, the use of indwelling catheters in nursing homes reduces the costs of urinary incontinence, but an increased prevalence of infections is seen, leading to significant secondary costs of hospitalisation and antibiotics (Kunin *et al.*, 1992).

Table 9.1. Effect of age and ADL impairment severity score on per cent survival at one year (Donaldson *et al.*, 1980)

ADL severity score	Age group (years)			
	65-74	75-84	85-94	95+
0-2	90.1	86.5	84.4	81.6
3-6	85.9	75.4	75.0	68.4
7-11	62.1	61.8	57.8	64.9
Total	83.4	77.8	74.4	71.2

Note: This study categorised ADL impairments into grades of ability, and used these in deriving an overall severity score, with 0 representing no disability and 11 being equivalent to failure on all 6 ADLs. The figures show mortality rates increasing with higher levels of disability, and disability lessening the impact of age on mortality.

9.3 *Identifying Trends in Mortality, Morbidity and Disability*

9.3.1 In recent years there has been a marked improvement in annuitant mortality. In comparing current life expectancy with theoretical biological limits, it is likely that significant further improvements will occur (Manton & Stallard, 1996). The National Long Term Care Surveys of 1994 and 1989 show that the prevalence of disability is decreasing amongst the elderly, with 10 of the 16 medical conditions examined in these surveys showing similar reductions. See Table 9.2.

9.3.2 In explaining these trends, it is important to bear in mind that the members of the CCRC will have been born in the early decades of this century. Throughout this century there have been major advances in the fields of public health and medical care. It should be noted that some of these have had unfortunate side effects, which themselves needed addressing, such as excessive amounts of vitamin D used in the treatment of rickets leading to increased rates of heart disease.

Table 9.2. Chronic disability prevalence rates for elderly over 65 in the United States of America (Manton *et al.*, 1995b; Manton *et al.*, 1997a)

Functional status	Per cent in National Long Term Care Surveys		
	1982	1989	1994
IADLs only	5.6	4.4	4.3
1-2 ADLs	6.6	6.5	5.9
3-4 ADLs	2.9	3.5	3.2
5-6 ADLs	3.6	2.7	2.8

9.3.3 However, in aggregate, by spending a greater proportion of their lives exposed to improvements such as in general levels of hygiene and medical care, more recent cohorts of individuals are experiencing lower levels of morbidity at comparable ages, and thereby lower mortality rates and lower incidence of disability. Indeed, since recent decades have witnessed further advances, such as an increased intake of vitamin B6 to prevent atherosclerosis, it is likely that age-specific incidence rates will continue to fall (Manton *et al.*, 1997b).

9.3.4 Despite this, it is possible that, over the next 30 years, new crippling diseases may appear or social conditions worsen, and so it is impossible to rule out a worsening trend in the prevalence of morbidity and disability. This uncertainty should be borne in mind by any CCRC operator. It is beyond the scope of this paper to discuss this in detail, but we mention some potential developments to highlight the level of uncertainty in any one set of assumptions:

- (1) Diseases such as tuberculosis are becoming more prevalent as a result of strains of micro-organisms resistant to even the latest forms of antibiotics. The rapid spread of resistant strains of micro-organisms, especially in hospitals, in comparison with the time required to produce new generations of antibiotics, may mean that the prevalence of 'superbugs', and of untreatable morbidity, will increase.
- (2) In the treatment of congestive heart failure, the use of ACE II inhibitors not only improves survival, but also restores a degree of function. This reduces both morbidity and disability, but the prevalence of morbidity will be reduced not only by drugs that cure conditions, but also by those that prevent, or merely delay, onset. In the case of conditions whose incidence increases markedly with age, such as cataracts, the impact on prevalence of delaying onset could be dramatic (Manton *et al.*, 1995b).
- (3) Surgical techniques are improving constantly, and, in fields such as transplantation and joint replacement, advances are significantly enhancing the quality of life of the individual and reducing chronic disability. Further to this, the increasing sophistication of computers offers a wide range of possibilities to assist those with severe disabilities.

9.4 Limitations on Projections

In view of the above, it is clear that any attempt to estimate future care needs

from current data is likely to be subject to a considerable margin of error. This has the following practical consequences:

- (1) Models of future care should not be viewed as good predictors of future experience, but rather as indicating a range of outcomes. As least as much attention should be paid to the sensitivity of the results to assumptions and to the stochastic variation of results on any one set of assumptions, as to any central set of results.
- (2) The management and charging structure of the CCRC must be sufficiently flexible to respond appropriately in the face of short-term and long-term variations of experience.
- (3) Analysis and management must be closely interlinked. In the initial years actuarial analysis of actual against expected experience may give warning of trends that require remedial action. Without this warning, detection of the problem may only occur several years later, at which point it may be impossible to remedy the situation without drastic action that risks antagonising the members.
- (4) Models of past experience cannot be guaranteed to provide accurate predictions of care costs in 30 years' time. Hence, little benefit is gained by producing highly detailed and sophisticated models that can analyse large quantities of historical data.

10. THE NEED FOR REGULATION

10.1 There is currently no regulation specific to CCRCs in the U.K., although there is a substantial body of more general regulation which would affect their operations. In particular, there is no requirement for those establishing a CCRC to take actuarial advice. Hence, there is no regulatory obstacle which would prevent a CCRC on the lines of XYZ being established without actuarial advice, and subsequently running into financial difficulties.

10.2 In our view, this represents a potentially significant area of risk to the establishment of a significant number of CCRCs in the U.K. A CCRC which gets into difficulties could have disastrous consequences for those elderly people who had invested the value of their home and their life savings in it. In addition, the adverse publicity that would surround such a failure could damage the whole concept of CCRCs. Even in the absence of any difficulties, the perception that CCRCs were not subject to proper financial control could give rise to adverse publicity, thereby arousing a suspicion of mismanagement.

10.3 In order to avoid these risks, we are of the view that there should be a regulatory requirement for the directors of a CCRC to take actuarial advice, as is increasingly the practice in the U.S.A.. An actuarial report should be required before the CCRC receives any payments, such as commitment fees, from prospective members. A copy of this report, or an abstract from it, should be

made available to a statutory body charged with supervision of CCRCs and to those who have expressed an interest in joining.

11. THE NEED FOR PROFESSIONAL GUIDANCE

11.1 In our view actuarial reports should include the following:

- (1) the finances of the CCRC considering the initial members in isolation, without explicit projection of new members, but in the context of the CCRC as a going concern; which will enable an assessment of the extent to which the charges made to existing members are adequate to meet their costs, and will highlight whether the viability of the CCRC is dependent on the income from future new entrants;
- (2) the finances of the CCRC with explicit projection of new members replacing existing members; which will permit an assessment of the adequacy of the CCRC's charges on a realistic basis; and
- (3) the ability of the CCRC to discharge obligations to initial members if the CCRC were to fail to attract an adequate number of future new members. Management should develop an exit strategy, for example:
 - transferring members in the care centre to nursing homes and buying ill-health annuities to finance their care;
 - amending the terms of ownership for the independent living units to be appropriate to normal residential ownership;
 - securing appropriate long-term care insurance for members in independent living units; and
 - selling the care centre to a residential/nursing home operator.

11.2 The report should show the sensitivity of the results to key morbidity, mortality and economic parameters.

11.3 However, we consider that it would be premature for the profession to issue guidance in respect of CCRCs at this time. So far as we are aware, the case study represents the first CCRC in the U.K. which requires actuarial advice because of the nature of its long-term care commitments. Accordingly, there is, as yet, only very limited practical experience of dealing with CCRCs in the U.K., and, therefore, there is no good basis in established actuarial practice for issuing such guidance.

11.4 In contrast, in the U.S.A. there is substantial actuarial experience of CCRCs and professional guidance in respect of them. While this may well provide a valuable starting point for any guidance introduced in the U.K. in the future, it would not, in our view, be appropriate to attempt to adapt it to the needs of the U.K. without first gaining experience of the issues that arise in practice in a U.K. context.

12. CONCLUSIONS

12.1 CCRCs provide an attractive option for dealing with the security, social and care needs of the elderly. However, only those members of society in the higher socio-economic groups are likely to be able to afford the fees associated with them.

12.2 There are many complex financial and management issues related to running a CCRC successfully. In the paper, these are illustrated by the case study. It is vitally important that these issues should be properly understood, and proper advice, including actuarial advice, taken by those contemplating the establishment of a CCRC. Failure to do so would carry substantial risks, including insolvency, with possible financial ruin for the members of the CCRC and with damaging publicity to the whole concept of CCRCs.

12.3 The case study has a financial structure which involves taking a degree of risk higher than that which most commercial organisations would regard as appropriate. The paper has discussed the ways in which a commercial organisation may seek to reduce the level of risks. It should be noted, however, that even with a careful programme of risk reductions, CCRCs still carry many uncertainties, and should be established only by organisations with sufficient financial strength to bear these risks.

12.4 In our view, regulation requiring actuarial certification of CCRCs is necessary to reduce the risk of a CCRC being established on ill-considered financial terms. We would not, however, recommend actuarial guidance in this area until more experience is gained of the way in which organisations may seek to establish CCRCs in the U.K.

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APPENDIX A

FURTHER DETAILS OF PROJECTION MODEL

A.1 *Transitions in Projection Model*

A.1.1 Table A.1 shows permitted transitions between states, for example, T(B,RS) is the transition from state B to state RS. Transitions which are not permitted are shown as 'x'.

Table A.1. Permitted transitions in projection model

Transition to	Transitions — from									
	B	BL	BM	BH	RS	RL	NS	NL	D	E
B	T(B,B)	T(BL,B)	T(BM,B)	T(BH,B)	T(RS,B)	X	T(NS,B)	X	X	X
BL	T(B,BL)	T(BL,BL)	T(BM,BL)	T(BH,BL)	T(RS,BL)	X	T(NS,BL)	X	X	X
BM	T(B,BM)	T(BL,BM)	T(BM,BM)	T(BH,BM)	T(RS,BM)	X	T(NS,BM)	X	X	X
BH	T(B,BH)	T(BL,BH)	T(BM,BH)	T(BH,BH)	T(RS,BH)	X	T(NS,BH)	X	X	X
RS	T(B,RS)	T(BL,RS)	T(BM,RS)	T(BH,RS)	T(RS,RS)	X	T(NS,RS)	X	X	X
RL	T(B,RL)	T(BL,RL)	T(BM,RL)	T(BH,RL)	T(RS,RL)	T(RL,RL)	T(NS,RL)	X	X	X
NS	T(B,NS)	T(BL,NS)	T(BM,NS)	T(BH,NS)	T(RS,NS)	X	T(NS,NS)	X	X	X
NL	T(B,NL)	T(BL,NL)	T(BM,NL)	T(BH,NL)	T(RS,NL)	T(RL,NL)	T(NS,NL)	T(NL,NL)	X	X
D	T(B,D)	T(BL,D)	T(BM,D)	T(BH,D)	T(RS,D)	T(RL,D)	T(NS,D)	T(NL,D)	T(D,D)	X
E	T(B,E)	T(BL,E)	T(BM,E)	T(BH,E)	T(RS,E)	T(RL,E)	T(NS,E)	T(NL,E)	X	T(E,E)

A.1.2 The model distinguishes between single lives and joint lives. For single lives the transition probabilities used by the model vary with the combination of age, sex and current state (as above). For joint lives, the transition probabilities vary with an additional parameter, namely the current state of the other life. The projections treat each life as one unit rather than treating the joint lives as one unit.

A.1.3 The probability of moving to state E was assumed to be zero.

A.2 *Economic and Demographic Assumptions in Projection Model*

A.2.1 The profile of the starting population of the Case Study CCRC is derived from a priority register of those who have paid a deposit of £1,000 towards the cost of the bungalows. This profile is also used as the basis for the Commercial CCRC.

A.2.2 The assumed starting population consists of 83 single lives and 69 couples. This is comprised of 88 males, with ages between 63 and 89 years, and of 133 females, with ages between 60 and 89 years.

A.2.3 The starting population of the Case Study CCRC is split according to membership fees 103:45:4 for the refundable basis, the non-refundable basis and the annualised rental basis, respectively. All membership fees in the Commercial CCRC are assumed to be on the refundable basis.

A.2.4 For a two-bedroom bungalow, of which there are 96, the refundable membership fee is assumed to be £83,000, and for a one-bedroom bungalow, of

which there are 56, the refundable membership fee is assumed to be £65,000. The insurable values of the bungalows are assumed to be 80% of the refundable membership fee.

A.2.5 All future new members are assumed to enter on the same membership basis as the original occupants, and the refundable membership fee is increased by property inflation for the elapsed period since the start of the projection. Equivalent non-refundable and annualised membership fees for the Case Study CCRC are derived from this inflated amount.

A.2.6 For the purposes of modelling, the payment of refunds is assumed to occur when the bungalow is vacated. However, in practice, members of the Case Study CCRC that transfer into the care centre on a permanent basis will receive any refund that is due to them only when they leave the community.

A.2.7 Bungalow care costs are projected at £5.40 for each man-hour required by members of the CCRC in states 'in-bungalow — low level', 'in-bungalow — medium level' and 'in-bungalow — high level', inflating with average salary inflation for each subsequent year of projection.

A.2.8 Non-care costs are set to be £323,500 in the first year of the projection, and are projected to inflate with average salary inflation in each subsequent year of the projection. Under the projections for initial members only, the underlying amount before inflation reduces in line with the number of members.

A.2.9 In the Case Study CCRC, annual subscriptions are assumed to be £4,500 for a 75 year old, irrespective of sex, increasing/decreasing by 2% for each year above/below this age. In each year of the projection, subscriptions are the same for initial and replacement members of the same age, and increase by subscription inflation with each subsequent year of projection.

A.2.10 Annual subscriptions in the Commercial CCRC are composed of care charges and non-care charges. The non-care charges cover major repairs, repayment of start-up loans and non-care services, and do not differ by sex or age. The care charges are set by the insurer, based on the expected cost of providing care and on profit loadings for the insurer and CCRC. These charges are specific to the age and sex of the member, and increase by subscription inflation with each subsequent year of projection.

A.2.11 In 10% of the bungalows of the Case Study CCRC, members are projected to capitalise 50% of future subscriptions by a payment on entry. The relationship between this initial payment and the reduction in future subscriptions is determined by an age-related capitalisation factor. It is assumed that no charges are capitalised in the Commercial CCRC.

A.2.12 Joint lives in the Case Study CCRC each pay a separate annual subscription, but the level of this subscription is 12.5% less than for a single member of the same age. There are no discounts for joint lives in the Commercial CCRC.

A.2.13 The value of the communal facilities, together with underlying land, is assumed to be £3.0m. The value of land underlying the bungalows is assumed to be £2.5m.

Table A.2. Economic parameters used by projection model

Retail price index	3.50%
Property inflation	RPI + 2.00%
Insurable value inflation	RPI + 2.00%
Subscription inflation	RPI + 1.75%
Average earnings inflation	RPI + 1.75%
Interest rate on loans (Case Study CCRC only)	8.00%
Interest rate on loans (Commercial CCRC only)	9.50%
Discount rate on future cash flows (Case Study CCRC only)	8.00%
Discount rate on future cash flows (Commercial CCRC only)	11.00%

APPENDIX B

DERIVATION OF MORBIDITY AND MORTALITY ASSUMPTIONS

B.1 *Morbidity Assumptions*

B.1.1 The base transition probabilities underlying those in our model are taken from 'A Longitudinal Study of Functional Change & Mortality in the United States' (Manton, 1988), which used the 1982 and 1984 Long Term Care Surveys as its disability database. These base transition probabilities are reproduced in Table B.1.

Table B.1. Transition probabilities, with a time period of 2 years, between disability levels based on 1982 and 1984 National Long Term Care Surveys (Manton, 1988)

Male/Female 1982 status	1984 status											
	Not disabled		IADL only		1 to 2 ADLS		3 to 4 ADLS		5 to 6 ADLS		Institute	
	M	F	M	F	M	F	M	F	M	F	M	F
Not disabled												
65-74	85.99	88.73	2.48	3.54	1.39	2.13	0.72	0.77	0.55	0.55	0.62	0.50
75-84	72.87	73.74	4.77	6.39	3.66	5.01	0.71	1.66	1.42	1.06	1.63	3.08
85+	48.77	46.49	6.69	7.24	8.76	10.92	3.14	2.38	2.05	3.56	4.32	10.16
IADL only												
65-74	14.62	13.09	48.62	45.56	12.49	20.48	0.95	5.71	4.87	2.84	1.90	4.13
75-84	11.00	4.90	36.64	37.60	13.93	25.87	6.54	5.74	7.15	2.87	6.69	7.72
85+	1.42	0.60	33.41	29.12	15.40	28.21	6.65	5.25	4.04	6.34	5.68	11.18
1 to 2 ADLS												
65-74	3.43	7.88	15.96	19.92	31.24	39.82	16.24	10.79	7.15	4.79	5.32	4.22
75-84	2.62	2.66	11.47	15.09	29.59	37.00	8.26	12.81	8.08	4.26	2.49	10.11
85+	0.00	0.67	6.58	8.81	20.86	32.39	10.97	16.07	13.79	8.57	15.68	12.32
3 to 4 ADLS												
65-74	4.63	2.85	5.44	6.03	19.89	27.61	22.15	28.28	17.19	16.98	2.43	6.38
75-84	3.09	0.41	3.09	3.68	8.55	20.14	18.54	23.70	18.17	20.50	10.46	12.26
85+	0.00	0.00	1.82	2.24	5.45	7.85	12.14	21.52	19.98	26.04	12.72	17.55
5 to 6 ADLS												
65-74	1.26	1.08	6.18	8.64	9.87	9.39	10.13	10.16	31.90	32.68	5.69	7.65
75-84	1.35	0.45	4.72	4.42	5.02	8.38	8.11	9.26	26.40	35.04	8.12	12.82
85+	0.00	0.00	0.00	1.10	4.28	6.27	8.56	6.45	27.14	27.36	6.42	14.34

B.1.2 We assume that the following relationships between the CCRC and this above study are valid for a single person:

Bungalow — healthy = not disabled

Bungalow — low level care = only IADL impairments

Bungalow — medium level care = 1 or 2 ADL impairments

Bungalow — high level care = 3 or 4 ADL impairments

Residential/nursing care = 5 or more ADL impairments + institutionalisation.

B.1.3 For a member of a couple, whose partner is not disabled, the relationships are:

Bungalow — healthy = not disabled

Bungalow — low level care = 1 or 2 ADL impairments

Bungalow — medium level care = 3 or 4 ADL impairments

Bungalow — high level care = 5 or 6 ADL impairments

Residential/nursing care = institutionalisation.

B.1.4 If one member of the couple is in an occupancy state of bungalow — high level care or worse, the other member is treated as a single person in terms of the above definitions. Intermediate possibilities (e.g. one member in occupancy state of bungalow — medium level care) are derived by linear interpolation between the two extremes above.

B.1.5 Institutionalisation, in the above study, included acute and chronic hospitals, and the former are excluded from the transition probabilities through reference to the 1991 Great Britain Census (Office of Population Censuses & Surveys, 1993) which detailed elderly persons' housing arrangements. Supporting evidence is taken from the American Hospital Association, Hospital Statistics 1994-5 (American Hospital Association, 1993) and Hospital Episode Statistics, England 1993-4 (Government Statistical Service, 1995).

B.1.6 The collective transitions to residential and nursing care are separated, and further subdivided in terms of temporary and permanent occupancy of the care centre through reference to 'Report on Actuarial Study and Cash Flow Projection for Kendal at Ithaca' (Powell, 1994) and 'Analysis of CCRC Data' (Jones, 1995).

B.2 *Mortality Assumptions*

B.2.1 The mortality transitions suggested in the paper 'Longitudinal Study of Functional Change & Mortality in the United States' (Manton, 1988) are adjusted through reference to the disability prevalence by age and sex suggested by the 'OPCS Surveys of Disability in Great Britain, Report 1, 1988' (Office of Population Censuses & Surveys, 1988). This results in the combined mortality transitions from each state for a representative life matching the mortality rates implied by mortality tables published by the Institute of Actuaries IM80C10 for males and by IF80C10 for females, with an assumed deduction of three years from the actual age.

B.3 *Activities of Daily Living and Instrumental Activities of Daily Living*

B.3.1 The definition of an ADL impairment is meeting the dependence criteria given below (Katz & Akpom, 1976):

Bathing Requires assistance in bathing more than one part of body; requires assistance in getting in or out of tub or unable to bathe self

Dressing Requires assistance to completely dress self

<i>Toilet use</i>	Requires bedpan or commode or receives assistance in getting to and using toilet
<i>Transfer</i>	Requires assistance in moving in or out of bed and/or chair
<i>Continence</i>	Partial or total incontinence in urination and defecation without assisting aids
<i>Feeding</i>	Requires assistance in act of feeding.

B.3.2 In the National Long Term Care Surveys, an IADL impairment was defined as inability to complete at least one of the following tasks: light housework, laundry, meal preparation, grocery shopping, outside mobility, travel, money management and telephoning.

ABSTRACT OF THE DISCUSSION

HELD BY THE INSTITUTE OF ACTUARIES

Mr D. G. Ryan (introducing the paper): The concept of continuing care retirement communities (CCRCs), is by no means new. In the United States of America numbers have expanded rapidly in the last few decades, from what was only a small number of religious communities at the start of the century. At present, according to the American Association of Homes and Services for the Ageing, there are more than 2,000 CCRCs in existence, offering a wide variety of charging structures.

In contrast, in this country there are relatively few, and these CCRCs tend to fall into two groups: those that provide accommodation and services free of charge on a fully charitable basis; and those where charges are based on usage. The missing alternative, a self-insuring CCRC, is, ironically, the option that most elderly people might prefer. Long-term care is expensive, and many have serious concerns over the rapid erosion of their assets should care be required. Insulating the individual from such financial risks in a setting where health care delivery is guaranteed and easy to access is an offer that many will find interesting.

In this paper we describe one such CCRC, developed by the Joseph Rowntree Housing Trust and the Joseph Rowntree Foundation. We are grateful to the Trustees for allowing us to publish details of the CCRC's physical and financial structure, so as to assist possible future developments by other organisations. By examining, in the paper, the risks that such a venture might entail, and highlighting possible management strategies, we hope to clarify the issues facing interested non-profit and commercial organisations.

Links between CCRCs and actuaries are now well established, but this was not always the case. The need for actuarial input becomes clear when we consider that CCRCs will offer health care at a range of intensities to small populations of, say, two or three hundred members. This lifetime commitment by the CCRC to its members demands multi-state modelling and particular attention to the results produced on a wide range of assumptions. Indeed, in many states in the U.S.A. the talents of actuaries in this area have been recognised by making regular actuarial reviews a requirement of a CCRC's operating license. Such reviews serve a dual purpose: in protecting the investment of members; and in publicising the effective management of well-run CCRCs.

In summary, CCRCs represent a very attractive option to the elderly, with many social benefits. They are by no means the universal solution to increasing demands for long-term care, since members need to have a significant level of income and/or capital; but, perhaps, the increasing numbers of relatively affluent elderly individuals will encourage non-profit and commercial organisations to give serious consideration to developing CCRCs in the future.

Mr M. W. Sturge (a visitor): On behalf of my colleagues from the Joseph Rowntree Foundation, I thank you for your welcome to us.

It might be helpful if I explored, in more detail and from a non-actuarial perspective, some of the points which are made in the paper, covering: the Joseph Rowntree Foundation (JRF) objectives; the financial options; the current position on our scheme; and some long-term issues of which we are aware.

I have identified seven objectives for our continuing care retirement community which we are calling Hartrigg Oaks:

- (1) provision of good quality housing in a secure environment;
- (2) quality care services, delivered either to residents in their bungalows or in the care centre, which is situated in the middle of the site;
- (3) leisure and other communal facilities, such as the restaurant and coffee shop;
- (4) our aim for individuals to maintain their independence in his or her own bungalows for as long as possible, hence our commitment to deliver care services to an individual in his or her own home for up to 21 hours per week;
- (5) wishing Hartrigg Oaks to be full of activity, an environment of older people pursuing their existing interests and learning new ones;

- (6) our overriding objective to provide older people with an enhanced quality of life; and
- (7) a specific JRF objective, as Mr Ryan mentioned, that Hartrigg Oaks should be a model for the development of continuing care retirement communities elsewhere in the United Kingdom.

Turning to financial aspects, we have had two principal considerations in mind in designing the details. First, there is the need for flexibility. Some older people are capital rich, normally represented by their existing home, but income poor. Others are income rich, probably from an occupational pension, but capital poor. Many will have some capital and some income. Thus, flexibility to cover a range of individual circumstances is important. We also need to recognise that older people have different aspirations about their financial situations. Some would like their children to inherit as much of their resources as possible, and hence will be keen to preserve capital. Others will not be concerned about handing down wealth, but prefer to make maximum use of their resources during their lifetimes. The financial arrangements which are described in the paper have been designed so as to be neutral between capital and income. By and large, cash flow is not a significant issue for the JRF, so we are relatively relaxed whether we receive payment through one-off capital sums or through ongoing monthly payments.

The second objective of the financial arrangements is to provide residents with as much security as possible. One of the major uncertainties which we all will face as we grow older is the amount of care support that we are going to need. If we should need care, we have the further uncertainty over how long we will require it, and how much, if at all, the state will contribute towards it. One of the principal attractions of a CCRC is the sharing of the cost of care across the members. This means that individuals' fees do not increase as their care requirements increase. No-one needs to worry that their capital may be quickly eroded by high residential and nursing care fees.

A further potential worry for residents is that their fees may increase substantially in future years. To respond to this concern, we have given a guarantee that fees of existing residents will never be increased by more than 3% above the increase in the RPI over the previous 12 months. We do, however, retain the option of increasing the starting fees for future residents.

The above objectives have resulted in the following arrangements. A resident will need to make two payments. First, there is a residence fee, where there are three principal options: refundable; non-refundable; and annualised. Second, there is a community fee, where, again, there are three options: standard; reduced; and fee for care. The details are briefly covered in the paper, and more information is available.

The current position on our development is that we are building 152 bungalows and a 41-room care centre, together with substantial communal facilities. A show bungalow has been available for viewing for seven months, and we expect that the first bungalows will be occupied in April 1998. We have, so far, received 110 deposits of £1,000. We are reserving 10 bungalows for use by existing residents from our village of New Earswick, so we have only 32 bungalows unallocated at the present time. We feel that this is an excellent response, bearing in mind the novelty of the scheme, the limited marketing that we have undertaken to date, the fact that the communal facilities cannot currently be viewed, and that some bungalows are still at least 6 months away from completion.

Table 1. Hartrigg Oaks, household profile

	Number	%
Single males	17	16
Single females	51	46
Couples	42	38
Total	110	100

Table 1 shows the composition of the take-up for the 110 bungalows.

Table 2. Hartrigg Oaks, age profile (in 1998)

Ages	Male	Female	Total number	%
60-65	5	9	14	9
66-70	8	15	23	15
71-75	16	25	41	27
76-80	10	21	31	20
81-85	11	16	27	18
86-90	8	7	15	10
over 90	0	1	1	1
Total	58	94	152	100

Next, Table 2 shows the current age profile of the population, which is a good age distribution, starting from 60, which is the minimum age where entry is possible. The average is 75.

Table 3. Hartrigg Oaks, fee options

Residence fee	Community fee			Total
	Standard	Reduced	Fee for care	
Refundable	59	5	7	71
Non-refundable	18	9	4	31
Mixed refundable/non-refundable	4	0	0	4
Annualised	4	0	0	4
Total	85	14	11	110

Then, Table 3 shows the take up of the financial options. The most popular are the refundable residence fee and the standard community fee. However, all of the financial options are being used, which indicates that the flexibility which we are offering is proving helpful to at least some people. There is a mixed refundable/non-refundable category, which covers a person who wishes to pay part of the residence fee on a refundable basis and part on a non-refundable basis. As well as being flexible over the initial financial arrangements in this way, we will also be offering flexibility over time, so that individuals may switch from the refundable to the non-refundable or annualised options, and hence release some of their capital. However, an individual would not be able to switch the other way round — that is, from a non-refundable to a refundable basis — since there would be a danger that they would choose to do so when their life expectancy was short.

We also need to address some of the longer-term issues. One of the crucial aspects is the change in the structure of the population over time. As with all new housing provision for older people, the population at Hartrigg Oaks is sure to age. While the average age, initially, will be 75, in 5 years' time it will be around 80, since there would have been very few withdrawals over this period. While there is not a direct correlation between age and activity, there is clearly a danger that the vitality of Hartrigg Oaks will decline over time. We need, therefore, to try to ensure that incoming members in future years help to re-balance the position. Potential residents have said to me on countless occasions, "I think that Hartrigg Oaks is a great concept, but I am not ready for it yet". After much internal discussion, we have decided to discontinue our waiting list procedure, since, by its very nature, those at the top of the list would have been there longest, and hence likely to be older than new names on the list. Thus, when vacancies arise in the future, we are reserving the option of prioritising certain applications, possibly by age or to couples.

A further issue is the financial viability of the development. While the Foundation's resources are such that Hartrigg Oaks will never fail on financial grounds, our objective is that it should not be dependent on subsidy. If it did need bailing out, it would mean that our model would not be

appropriate for replication by others. Therefore, we will be closely monitoring our actual out-turn in comparison with the results from the model prepared by the authors, and we are also intending to have actuarial reviews every three years.

We hope that the development of Hartrigg Oaks and the interest that it engenders will lead to further CCRCs being built in the U.K. We see them as offering an additional option for meeting the housing and care needs of older people. They respond to many of the worries of older people. "What would happen if I suddenly need care? I may have: financial worries; fears about personal security; a house which is difficult to maintain; concern for my partner if I should die first; loneliness."

However, CCRCs will obviously not suit everyone. The main test is whether they do, in practice, provide an enhanced quality of life for those who choose to live there.

Ms H. Raybone, F.I.A. (opening the discussion): On first sight, I did take issue with part of the title of the paper — 'attractive to members'. I was sceptical about this venture until speaking to Mr Sturge and visiting the Hartrigg Oaks site. I am now prepared to admit that the Hartrigg Oaks concept is, indeed, attractive to members, although I still have a few doubts about the attraction of a similar commercial venture.

Section 2.1 refers to the estimated 220,000 individuals currently residing in CCRCs in the U.S.A., and I was interested to know how this compared with sales of long-term care (LTC) insurance in the U.S.A. About 5 million Americans have LTC insurance — so only about 4% of that number reside in CCRCs. If the same preferences emerge in the U.K., then this does tend to suggest that the potential market for CCRCs is very small. (Currently 35,000 LTC policies are in force in the U.K.)

Paragraph 2.2.3 lists the number of attractions of CCRCs, but what about the drawbacks? In particular, are any data available on the number of individuals who decide that it is not for them, and leave the community? Presumably such exits are assumed to be cost neutral, given the zero probability which the model assigns to them. Even so, surely there is a risk of mass lapses adversely affecting the financial position of the scheme.

The waiting list referred to in Section 4.7 caused me concern. The management of a waiting list in the way described could lead to adverse publicity, and accusations of 'social engineering'. I was pleased to learn that the original plans have now been changed — although, in order for Hartrigg Oaks to function as intended, some degree of manipulation of the population is inevitable. I am still not convinced that the solution to this problem has been found.

In ¶4.1.3, which refers to beds in the care centre being available to non-members, the authors assume a deduction of 4%, to allow for the delay in filling the beds. Anyone else who thought this a very small deduction may be interested to learn that the waiting list for other Joseph Rowntree nursing homes currently numbers some 200 individuals — obviously this would not necessarily be the case for other potential developers.

Paragraph 6.1.8, referring to the risks involved in the commitment of the operators to provide long-term care and non-care-related needs, states that: "it is reasonable for the operator to receive a commensurate level of profit." This may well be reasonable in our eyes, as members of a profession whose speciality is generating such profits, but I wonder how the concept of profit-making organisations fits with the view of the general public, who are, perhaps, more used to sheltered housing, nursing homes and similar, being owned and/or managed by local authorities, charities, or other non-profit organisations.

This, coupled with the different approaches to management and pricing which a commercial organisation may have to adopt to make adequate returns (e.g. managing the age profile in ¶6.2.1.8, and removing the upper limit on the annual charges in ¶6.2.3.3), in my view present significant barriers to the attractiveness of a commercial CCRC to members. I suspect that, if presented with the choice between a commercial CCRC and the case study CCRC, the commercial CCRC would come a poor second.

In Section 7 the authors demonstrate that it is possible to come up with a set of assumptions which show that investing in a CCRC could be a viable proposition for a commercially motivated institution. However, they point out, in ¶9.4, that models of future care should not be viewed as good predictors of future experience. If I were a potential investor, I would hesitate to be convinced on these grounds,

knowing from experience that, when dealing with a model containing so many variables, it is more often than not possible to find one hundred and one different ways of generating the answer that you want.

Section 8 raises the issue of the role of LTC insurance for CCRCs. My view is that the LTC market in the U.K. has yet to reach its full potential, and this could be an ideal platform to launch to a new consumer — i.e. the CCRC care provider, rather than the individual, thereby removing some of the often-cited barriers to LTC sales — for example, the “it will not happen to me” argument, or the “I cannot afford it on my pension” argument.

The authors correctly state that there are a number of not insignificant problems to address, as listed in ¶8.3. However, I agree with their belief that these problems are not beyond solution, but must surely require much more partnership and co-operation between government, the insurance industry and potential CCRC operators and investors than has previously been seen in the U.K. I would add to the attributes of flexibility and trust (cited as requirements for satisfactory conclusions to be reached), the possibility that we, as a profession — and indeed an industry — may need to exhibit a noticeably higher appetite for risk than we are traditionally renowned for.

Section 9 concerns itself with the mortality and morbidity assumptions for a CCRC. This has to be the most difficult area for actuaries involved in such modelling work. As for LTC insurance, in the absence of any home-grown insured data, we resort to using experience from the U.S.A., and I am not sure how confident we can be that it is strictly relevant, given the very different approach to health and care provision adopted in America.

Paragraph 9.4. refers to the need to closely inter-link management and actuarial analysis. This strikes me as being crucially important, but I am concerned that the concept of the ‘control cycle’ is something which many actuaries never revisit, having passed Subject F. If we are not able properly to monitor the experience of our own business, and feed it back into our own pricing bases for our own products, are we going to be able to provide such a service to a third party, whose data may not be available in the required format, is unlikely to be sufficiently large to be credible, and, in the event of it leading to unfavourable conclusions (i.e. increases to fees), is in danger of being dismissed as the irrelevant findings of ‘those conservative actuaries’?

I would, therefore, stress the importance of ensuring that the data collected as members join a CCRC are sufficient to enable a full actuarial investigation of the mortality and morbidity experience of the population, and whilst I agree that we cannot provide accurate predictions 30 years hence, and so should not waste our time developing all-singing, all-dancing models, I would err on the side of collecting too much data at outset, rather than too little. This is unlikely to be particularly onerous, given the technology currently available to us.

Now considering Section 10, and the question of whether or not professional guidance is required, I would agree with the authors that this would currently be premature in the U.K. As fascinating as I find the subject, and I sincerely hope that the Hartrigg Oaks Community is a success, both financially and in its aspirations to provide a genuine community for a growing proportion of our population, there remains the possibility that other institutions and commercial organisations will not follow in the pioneering footsteps of the Joseph Rowntree Foundation. In this case, the production of an Actuarial Guidance Note would strike me as being somewhat over-zealous on our part.

I also believe that the actuarial principles employed in the modelling of a CCRC are not radically different in nature to those commonly used in other fields of actuarial work. We pride ourselves on our ability to apply the tools of our trade to many and varied situations, and so I believe that, currently, we have sufficient guidance notes to ensure that we are well equipped to deal with the challenges presented by CCRCs.

I agree with the authors’ conclusion that, in the event of further development of CCRCs, regulation requiring some kind of actuarial certification would be desirable — probably no less frequently than triennially, although I would hope that any organisation entering into a venture of this nature would seek the involvement of the actuarial profession as a matter of course.

Mr R. E. Snelson, F.I.A.: I speak as the Chairman of the Health and Care Committee, and it is our responsibility to further the development of the profession in this area.

Although it is not a life style that everybody would want, nevertheless there are attractions in CCRCs for a significant sector of the market. Given the expected increase in demand for various forms of care, my view is that it should be possible to devise a financial structure that would give a reasonable return to a commercial operator. It may be based on the return on capital, and any investor would have to recognise that, essentially, this would be a long-term investment. As the authors suggest, a satisfactory financial operation requires as close a matching as possible of the underlying cash flows. This, of course, is a disadvantage compared to the flexibility that was mentioned by the opener. It would also probably mean that the facilities would have to be restricted to some extent to those essential for the given purpose — obviously the care facility and the catering facility would be very important. Swimming pools may not rank so highly.

Given the experience in the U.S.A., it would seem essential that CCRCs should be regulated. In the first place the average age at entry is relatively high, and a significant proportion of the elderly are notoriously vulnerable to possible mis-selling. The other area where protection is sorely needed is the financial arrangements. It is simply not acceptable for a situation to arise where elderly people give up their homes and enter a CCRC, only to find that the organisation goes bankrupt and they are made homeless. The situation clearly calls for regular financial monitoring, and actuarial certification on a three-year period would obviously be desirable. I also wonder whether there needs to be regular inspection of the facilities. Clearly, if the facilities get into a run-down condition, it will be difficult to recruit replacements when units become vacant. Refurbishment is apt to prove expensive, and needs to be built into the financial planning process. It may be that it can be left to the CCRCs to police themselves in this area, as it is clearly in their interests to do so. However, the downside if things go wrong is such that it may be felt that the residents need protection.

As far as guidance to the actuarial profession is concerned, it is premature to consider issuing guidance at the present time. Nevertheless, it is such an important future development that the matter needs to be kept under review by the Health and Care Committee.

Mr A. R. Hewitt, F.I.A.: In ¶9.4, dealing with limitations on projections, I agree that little benefit would be gained by developing highly detailed and sophisticated models if the aim is to produce broad predictions of care costs and the physical design of care facilities in a CCRC. The key conclusion for both of these issues is flexibility — flexibility in the quality of, and charging for, care costs, and built-in flexibility in the physical design of the care facilities.

However, more sophisticated models can be justified if the aim is to answer questions such as:

- (a) What is the impact of setting different levels of underwriting conditions in the rules for admission to the CCRC?
- (b) Can members be admitted with special additional charges or restrictions for existing health conditions, and at what level should these charges/restrictions be set?

The comment of the opener about collecting the right level of data at the outset is very relevant here in terms of patient records.

There is also a grey area between health care costs for acute conditions (financed through insurance or free on the NHS) and health care costs for chronic or long-term recovery conditions (often not covered by insurance or the NHS).

It will be important to have the ability to model shifts from free or insured health care to health care where the costs fall on the CCRC — either as a result of improvements in medical technology or from changes in the degree of health care management in the NHS or insured facilities. This shift in cost onto a CCRC can also arise simply from targeting high quality, cost-effective care — moving patients from intensive care/acute care towards the CCRC environment as early as possible. There is a considerable amount of actuarial expertise — using detailed medical data on diagnoses and medical procedures — which can be applied to build practical models to answer these questions.

Mr P. A. C. Seymour, F.I.A.: As Chairman of the Wider Fields Board, I believe that this paper gives us an excellent example of how actuaries can help manage long-term risk, and, in this case, with many socially desirable benefits.

We have, in the wider fields grouping, a sub-set dealing with corporate finance. That sub-set has already been quite closely involved with the Private Finance Initiative (PFI). In that context, it seems to me that the stress factors centre around the transfer of risk. When is the government truly transferring the risk from its own balance sheet to the private sector? In this CCRC context, similar issues would appear to arise between the three parties involved (and, for the moment, I will not consider the role of the government): the customer; the operator; and the insurer; on the assumption that we are looking at the commercial model.

The attraction to customers is very much to know exactly where they stand. The attraction, it would seem also, to commercial providers — and remember my PFI example — is that they, too, would like to know exactly where they stand. They would not like to take on the risks involved. That leaves the third party to this transaction, which is the insurer, as the risk carrier. The trend has been for insurers to transfer risk away from themselves and to the customer. There are several examples. For instance, private medical insurance is renewable annually. Costs go up, and the customer foots the bill. In the savings area, we have unit-linked products where the investment risk is transferred to the customer compared to with-profits policies. On the pensions front we have a big rise in defined contributions versus the defined benefit or salary-related pension.

All these behaviours are transferring risk from the insurer to the customer. Even in the area of group risks, the insurer is often no more than a cost plus administrative service, because the experience rating is simply transferred back again to the customer. So insurers, and more particularly re-insurers, should really get back to some real risk taking. They should start to offer genuine guarantees which the customers need.

Mr Snelson mentioned the Health and Care Committee, which is also part of the Wider Fields Board. We had our first conference at Warwick University in 1997, and the question of guarantees came up. We commissioned a special working party under Mr S. R. Nuttall, and they are going to look at the medical aspects of these types of guarantees. I hope that we shall have some interesting research findings to discuss at our second Warwick conference in July 1998. One thing that I am sure of is that we actuaries must make a full and proper contribution to that discussion.

In Section 5 the authors compare the use of stochastic models with simple deterministic models that say, for example, that the future return will be an $x\%$ interest rate, and that the answer will be y . This stochastic approach is a technique which is used more and more by actuaries these days. Such a model increases the information we get. To illustrate that point, in Figure 5.10, the case study demonstrates that there is apparently a 30% chance that the Hartrigg Oaks facility will run out of care beds in 20 years' time; 30% is actually quite a big chance. The paper then discusses ways in which that could be managed, one of which is, since you have not beds for them, to carry out more of the care in the residential accommodation. Clearly that can be done, but at a higher cost. So the financial risk remains, and the probability is not small.

In another context, I had the pleasure of working with Rowntree when they did their inquiry into 'Meeting the costs of continuing care'. It will be interesting to see, now that we have the Royal Commission, how its recommendations finally compare with what we came up with. We wanted a government/private sector partnership. In practice, even for a scheme on a national scale, we recognised that there would be a need for what Richard Best rather elegantly called 'in-flight corrections'. We actuaries call them adjustments to the funding rate.

The question here is: what are the 'in-flight corrections' that might be available to a CCRC of this sort? Unfortunately, the answer appears to be 'not many'. If the customers are truly to know exactly where they stand, there cannot be many. However, as experience develops, the one variable that we can influence — and Mr Sturge touched on that — is the starting price for new entrants. Curiously, another way to reduce risk is actually to have an older age profile, so that the period of variability out into the future, for disability or mortality not turning out as you thought, is actually shorter. This means that there is less variability, which leads me to another risk management point.

In this discussion we have heard that the characteristics of a CCRC age profile are that they age as a cohort. In the models before us the paper builds that ageing process into its assumptions about new members entering the scheme. Therefore, my advice to future operators of schemes of this sort would be to try hard to make that starting mix of ages turn out to be what we actuaries call the

'stationary condition' — that is to say that the population is turning over on a constant basis. That means taking more older people at the start, because it is quite easy to sell the community concept to like-minded 65 or 70 year olds, who will all age in that cohort together. It has, of course, the added advantage of allowing earlier 'in-flight corrections', because 'in-flight corrections' can be made when people die, and their replacements come in at a higher or a lower price. This is a point that is worth careful thought.

Our society is currently trying to re-design some new approaches to welfare and health care for the next millennium. The concept of public and private partnership is well accepted by everyone. In this country we may find that health management organisations have an increasing role to play in the field of acute care, just as CCRCs will in the field of longer-term chronic care for the elderly. All of these concepts require a sharing of risk between public and private sectors. Maybe, as we continue to get more affluent, and as society sees the merits of CCRCs, mechanisms could be developed with government involvement as an underwriter of last resort.

I hope that this excellent social development will continue apace, and that, ultimately, commercially viable schemes can be developed for a wider cross section of the public. It certainly merits all the positive contribution that we, as actuaries, can bring to bear.

Mr G. L. Brace (in a written contribution that was read to the meeting): As an actuary practising in the CCRC industry in the U.S.A., I found the paper very interesting. My comments cover the following areas:

- (a) population projection methods;
- (b) measures of solvency;
- (c) allocation of capital expenses and equity between generations;
- (d) consumption pattern of capital and operating expenses; and
- (e) causes of CCRC financial difficulties in the U.S.A.

Population Projection Methods

Most actuaries in the U.S.A. develop population projection using an approach similar to that presented by the authors. Annual projections are developed using a deterministic approach for a baseline scenario, and a stochastic approach is utilised to determine the variance in outcomes for a given projection year.

Actuarial decrement rates have traditionally been developed by actuaries practising in the industry, and kept in proprietary databases. There is no published information currently available. However, there is a study being performed that is sponsored by the National Institute of Ageing and overseen by the Society of Actuaries, that will provide publicly available data containing mortality, transfer and withdrawal rates.

Measures of Solvency

The authors develop solvency measures using a net present value approach, and then add in the value of the building. This present value approach is appropriate for a new facility (subject to concerns discussed below). However, in order to measure the solvency of existing facilities, actuaries in the U.S.A. use all three of the following measures:

- (a) projected cash flows;
- (b) actuarial balance sheet; and
- (c) analysis of new entrant fee structure.

Cash flows are used to ensure that there is the necessary level of cash flows during any year, and an amount of cash reserves at any point to satisfy internal management, statutory, and lending authority requirements.

The actuarial balance sheet used by U.S. actuaries is somewhat similar to the analysis presented in the paper, and is a cumulative measure of the solvency of the facility. The actuarial balance sheet quantifies the impact of the actuarial adequacy of past resident fee schedules.

Finally, the new entrant fee structure analysis is based purely on the current fee structure, and tests whether the fee schedule for the current generation of residents is self supporting.

All three of these measures ensure that the facility will have the necessary reserves to fund both future capital replacements and health care needs, and provide the necessary cash flows during any future year.

Allocation of Capital Expenses and Equity between Generations

The authors develop the actuarial adequacy using a present value approach that is based on the net present value of the direct costs of providing care and housing to the first generation of residents, and then adding the total cost of the buildings. This approach, while simple to develop, may place the entire cost of the common space within the facility upon the first generation of residents.

The approach developed by the authors does not spread all facility costs to the first generation, but is limited to the common area of the facility shared by the residents. Each bungalow is built after the resident has expressed interest in the facility, and an entry fee is collected. Thus, the cost of the bungalow is supported from the entry fee, and there is a direct relationship between the entry fee and the construction costs of the unit. Since the resident purchases the unit, the sale is treated as a real estate transaction.

The majority of facilities in the U.S.A. build the entire campus, including the common areas and separate living units, using funds typically collected from bond proceeds. The facility then uses a combination of entry fees and monthly fees to pay off the bond proceeds over a period of time. Thus, under the approach used in the U.S.A., and possibly that in the U.K., it is important to ensure that the capital costs are spread between generations of residents, and that a proper allocation of capital costs between types of units is determined.

Consumption Pattern of Capital and Operating Expenses

Another important issue, often overlooked, is the consumption pattern of both capital and operating expenses. In order to test the adequacy of the fee structure, an allocation of expenses must first be made to each level of care, then further allocated to each resident or unit. This allocation process is important, since the present values are fairly sensitivity to changes in the assumed consumption pattern. For instance, a consumption pattern that allocates all expenses based on the number of residents will assign more expenses to entering residents (before a couple breaks up) than to existing residents where one spouse has either died or transferred to a higher level of care. In this case expenses will be under-allocated to existing residents, resulting in a liberal assessment of the financial solvency of the facility.

Causes of CCRC Financial Difficulties in the U.S.A.

The projection of resident transfer patterns is critical to ensuring proper determination of the adequacy of the resident fee structure. Many facility operators use cash flows as the primary determinant in assessing the adequacy of the fee structure. Resident population projections are used to determine unit turnover and health centre utilisation.

Financial difficulties from the mis-estimation of unit turnover and health centre utilisation can usually be dealt with by adjusting entry fees, monthly fees, and per diems paid by non-contract residents. CCRC operators usually have time to react to resident population outcomes that are somewhat different than expected.

However, there may be other assumptions that, if mis-estimated, could be more difficult to correct in a short time period. These assumptions are:

- (a) adequacy of refundable entry fees being miscalculated;
- (b) resident occupancy being less than projected; and
- (c) mis-estimation of the operating budget.

Typically, only the development of the refundable entry fees is included under the scope of the actuary, and, in fact, many times a facility will price the refundable entry fee based on the competitive environment, without ever consulting an actuary.

Resident occupancy is extremely critical; financial difficulties will most likely result if occupancy falls below, or never attains 75%. Because of the high overhead of both capital and operating expenses, many of the CCRCs that we have examined have break-even occupancy levels near 80% to 85%.

Mis-estimation of the operating and capital budget is also a source of financial difficulty, and CCRC operators may find it difficult to recover in a short time period to a mis-estimation of this component.

Mr I. R. Moran, F.I.A.: This paper fulfils a useful role in mentioning the significant, practical and theoretical experience that actuaries in the U.S.A. have had in CCRCs. I encourage any organisation that is serious about the potential for CCRCs to learn from the U.S. experience. A good introduction to some of the practical issues is contained in the Society of Actuaries' Study Notes, which would have been a useful addition to the references.

My comments concentrate on robust financial management and equity or pricing issues. However, the first comment is that it seems, from the case study, that it has been set up as a pre-payment for services arrangement. This technical detail avoids it being deemed to be carrying out insurance business, but it begs the question of whether it provides meaningful protection to members of the public who may have no other resources should it fail. I would, therefore, be interested to hear how the DTI views the case study.

Robust Financial Management

I welcome the authors' use of stochastic techniques to demonstrate the variability of care requirements. The magnitude of the financial risk requires more, however, than a present value figure plus a few sensitivity runs. I would find it instructive to see the distribution of the present value using a stochastic model.

When it is extended to commercial assessment, what about the cash flows? It is standard practice, in most actuarial valuations, to support a present value result with the underlying revenue accounts, both to provide a ready understanding as to what items are of most importance and to investigate the adequacy of the working capital. Actuarial reports on CCRCs written by my U.S. colleagues would always include such projected revenue items.

I wanted to understand the impact of the dynamics of care through, say, a simple sensitivity analysis. The key drivers to care costs are the actual underlying mobility and also the care management performance mentioned by an earlier speaker. The lack of credible U.K. experience on both these topics means that the outcome is very uncertain, both in its absolute level and also in its character.

Robust financial management, or, as Mr Seymour referred to it, 'in flight correction' relies on a careful understanding of what the critical influences are on a financial institution, and how they impact.

Equity or Pricing

The special nature of the case study may have meant that the usual considerations of equity between generations were not required. Indeed, the premium structure suggests that this was the case. Nonetheless, an actuarial paper could give proper consideration to this topic, since, without understanding the theoretical consideration, it is difficult to identify the correct management policy.

For example, in Section 6.4.3, called *The marketing problem of ageing*, the authors describe the recognised phenomenon that new members can steadily age as the CCRC matures. However, it is only a problem if the charging structure is inadequate across ages. A reasonable analogy would be a life company selling term assurance. It is not concerned with a steady increase in the average entry age, provided that its premium scales remain appropriate and robust. The problem may not be with ageing, but with falling occupancy ratios. I therefore suggest that a further component of work is needed when advising CCRC-type institutions, in addition to the items listed on ¶11.1. This would be an analysis of the current charging structure for new members, highlighting any apparent cross-subsidy between classes and the vulnerability to changes in the mix of new business.

The paper did not provide me with the comfort that the CCRC had not under-costed future major

repairs. It is important to continue to invest in the infrastructure to ensure that it retains its high quality status. We are probably all familiar with the problems if a nursing or residential home, or even a normal hotel, fails to invest. It can get caught in a vicious circle of failing to attract healthy, richer clients, resulting in increased care costs and further lack of funds for investment. I suggest that this gradual down-grading is potentially more of a problem than the marketing problem of ageing discussed previously.

Mr P. L. Gatenby, F.I.A.: I do not expect CCRCs to become a major provider of long-term care in this country, but some will be developed, and the initial experience at Hartrigg Oaks shows that there is some interest in this concept. Irrespective of whether we end up with just a handful of these organisations or a few hundred or a few thousand, it is important that they are all well managed — both financially and in terms of care standards. Consequently, both the financial aspects and the care standards need to be regulated in an appropriate fashion. If that regulation leads to a requirement for actuarial advice, then it will be our duty, as a profession, to make sure that those of our members who give that advice are given whatever help and guidance that they need to do it. However, we already have a working group that have already started looking at issues surrounding CCRCs.

Turning now to insurance, and where long-term care insurance might fit in, I know that quite a few CCRCs in the U.S.A. use insurance policies to help pay for the long-term care costs. There is a lot of benefit for a community which has only a few hundred occupants to use an insurance company effectively to help pool the risk. There are only a small number of people to share the risk, and, obviously, if they can use an insurance company's much larger risk pool to share their risk with, that must only be to the financial benefit of the organisation and the residents.

There is a comment in §8.3(4), that insurance companies do not provide benefits and premiums linked to the RPI. However, they do, and I think that we recognise, as an insurance industry, that we need to allow our benefits to increase in line with an appropriate level of inflation.

I take on board the comments that the long-term care payment from any long-term care insurance policies that are used by CCRCs will need to be tailored to the care philosophy of that particular CCRC. There is no point in an insurance company saying: "You can have only our standard products, without standard definition of disability", if that is totally against the culture of the community. So, it is obviously going to be very important for those insurance companies that do want to get involved to be able to take a pragmatic view of, and understand, the culture of the community, and tailor their products accordingly.

In an ideal world we would all like to fully guarantee the premiums in long-term care insurance policies, but it is still the very early stages in the development of long-term care insurance. We do not know enough about the risks, and we do not know enough about how those risks are going to change into the future. In particular, we do not know whether they are going to increase or reduce. One of the lessons learnt when looking at the experience of CCRCs in the U.S.A. is that generally people end up living longer than was initially expected, generally at a level of dependency needing care for longer than expected. If we were going to guarantee the benefits, then we would end up taking a very conservative view of how much we would need to charge for that guaranteed risk. We may be in danger, as an industry, of giving poor value for money as an extra cost for that guarantee. This is already becoming an issue in the long-term care insurance market, in that we are beginning to see some insurance companies come in with guaranteed premium rates. I am not sure what the answer will be for CCRCs, but I doubt whether, in the early days, we would fully guarantee the future risk costs.

Mr R. Bessell (a visitor): My basic problem with the paper comes from my own background as a social worker, but it has financial implications. There seems to be no place in the Rowntree scheme for the occupants to be involved in making the major decisions. Consultation is necessary, but, until recently, there has been no tradition in Britain of frail elderly people being involved in decision making about themselves on any large scale. That is now changing, and the danger of not doing it is that you institutionalise conflict between the occupants of the scheme and the managers. Some North American schemes which levy an all-inclusive fee experience an inbuilt pressure to utilise

resources, or to over-utilise them. On the other hand, if there is a fee for service, then there is a disinclination to purchase appropriately. That can cause real difficulties, and efforts to manage can be easily misrepresented. The solution is probably the involvement of the occupants in the decision making.

The Harrigg Oaks arrangement is so large, and with such large fixed costs, that it is difficult to build in the degree of flexibility which is necessary to cater for a rapidly changing pattern of use. There has been, for a very long time, a relatively fixed view, where, for instance, the government has tended to provide housing for the fit and residential care for the frail, and never the two shall meet. This is now breaking down, and the pace of change is accelerating. Despite the fact of the demographic changes, with which everybody is very familiar, it is extraordinary that the occupancy of nursing homes is falling steadily. There is much money tied up in fixed costs for nursing homes, and it is going to be difficult to adjust financially if there is a changing pattern of use.

I accept, because of the reputation of the JRF, that the scheme has a waiting list, and it is felt to be reasonable to forecast an occupancy rate of 96% for the beds, but this may not carry through for the future. I have real doubts because of the way that the national pattern is changing. It must seem to the Trustees, to the actuaries and to the administrators who advise, that the limitation of future charges to RPI + 3% is reasonable, but to many elderly people it would be daunting, as there is a real tendency for prices to rise to their optimum. For people on fixed incomes and fixed resources, and a great many elderly people are, they could find themselves in real difficulties if the RPI + 3% actually turns out to be what actually happens. The incidence of genteel poverty is a phenomenon in Britain which has not been properly dealt with, and it is a much more serious problem than is generally recognised.

Mr M. D. Werth, F.I.A.: There are five sponsors to this arrangement: the individual; the family; the CCRC; the shareholder; and the state. We need to consider what each is contributing or looking for separately. In particular, the state has to look at what cost sharing is involved. It is not clear that the authors have thought through the entitlements to state benefit, and how the capital, in terms of the property, would be taken account of in their calculations of rights to Attendance Allowance and other means and needs tested benefits, because that would impact on the overall CCRC costs. Equally, there may be some positive benefits from the family, who could contribute to the costs.

If we consider what the individuals are buying into, they are selling their own homes, where they have had an equity stake, and purchasing an investment in this CCRC. Some people who are home owners may want to remain home owners, and, therefore, there are some benefits in them buying an equity stake in a CCRC property. Having an equity stake gives people the right attitude to maintaining their property and, perhaps, for the family to support the individual, given that they will get something when the individual dies and the estate is shared out. Also with home equity, there is the consideration that, if you have an equity stake, then your entitlement to state benefits is slightly different, because your property is excluded from the state means test. Equally, if you do not invest your home equity in this new CCRC, I wonder whether you could pass it to your family. If you pass it to your family on entry to the CCRC, then would the state have to provide you with care or the cost of care, because you would no longer satisfy the means test limit of over £16,000 of assets? By passing your money to your children and getting the children to fund some of your top-up costs, are you ensuring that the state does participate in covering your care costs?

My next point concerns an efficient care management system. We have to ensure that we do not promote the over-utilisation of resources. I draw attention to the German compulsory system, which is also being looked at in France and Japan and in other countries, where the compulsory element is quite a low level of care, after which the individuals have to top up for themselves. So perhaps, within the CCRC, the care that is provided by the CCRC should be at quite a low level, from which the individual then tops up. This could ensure that there is the right attitude to paying for care.

There are real difficulties in forecasting paid care statistics. There are issues of changing patterns of health that we do not yet know about. In particular, we do not know about the informal structure of support from the spouse and the family. When we look at projected usage costs, if it is within a community where the family are close by and can provide support, then should the entry costs be

different from where the family is not close by and they must draw on the resources of the community? There is also the motivation and attitude of the individual. We can underwrite for health, but can we assess motivation and attitude, particularly when an individual has entered the CCRC in order to get support, and it is there and available to him or to her?

The statistics used in the paper, from the National Long-Term Care Study carried out in the U.S.A., are, I believe, derived from Medicare data, based on non-institutional care. I am not sure of their relevance, both to institutional use and then to adopting them the U.K. However, we do not have anything much better.

When considering underwriting, can we, as a society, have underwriting checks where we stop people entering a CCRC because of health? From the statistics of the people we saw who are entering, 28% were over the age of 80, and I am not sure how good we are at working out who is a healthy 80-year old and who is not. How do we actually determine what is reasonable as the average health of an 80-year old? This is a new area for all of us.

If we extrapolate on the CCRCs, and consider a structure where we do not have a CCRC, but a community, and the community is there to support themselves through the use of, maybe, GPs and, perhaps, district nurses, then do we need the CCRC structure? Instead, we could all work together as a community, where we draw in the resources as necessary, and therefore the building and all the other physical elements are not actually required. If we do extrapolate this way, do we actually get back to friendly societies and the way that they have served their communities?

Mr R. H. Plumb, F.I.A.: Important facets of a CCRC are ageing and the entry policy. Some sheltered housing has started with cohorts of 65-year olds, and 15 years later there are cohorts of 80-year olds. The comments about a CCRC's entry policy are very relevant, as these also apply to other forms of sheltered housing and elderly housing in this country.

The elderly are with us; they are vulnerable, and I know, from my own family experience, just how vulnerable they become. Regulation is very important, and should be encouraged for long-term care insurance and in this area of CCRCs. We need to build on the experience of other countries, not just the U.S.A., where the CCRC movement is now well established. In the U.S.A. the movement was damaged by financial failures. In the U.K. regulation should come sooner rather than later. As a profession, we can build on existing guidance notes and take the good work produced elsewhere, having it ready as and when we need it, and we will need it.

We are dealing with a body of elderly lives. For pension funds a valuation every 3 years is probably acceptable, but I suggest that for CCRCs we need annual, perhaps simple, valuations. If there is a run of deaths or if there are fewer deaths than expected, if more or less care than is expected is required, then these experiences are important in a small community. These risks can be reduced by insurance and financial re-insurance.

One aspect which I believe is very important is the quality of care. Practitioners in the U.S.A. extol the increase in the quality of life; in the increase in longevity; in the general increase in the quality and the delivery of care. The efficiency in delivery of care appears to have been forgotten in the U.K., despite the long-term demographic projections which indicate that the amount of care to be delivered is going to have to increase. Efficiency in delivering that care is going to become important to us.

Mr L. M. Eagles, F.I.A.: U.K. actuaries have been involved with various financial aspects of CCRCs for over a decade, but this is the first time that the subject has been discussed in depth by the profession.

There was a considerable interest in the U.K. about 10 years ago, by both commercial and charitable sponsors, in setting up Type A or extensive CCRCs, as defined in ¶2.2.4, and a number of these organisations took actuarial advice. However, it now appears that only the CCRC that we are discussing here, and possibly one other, have proceeded with their plans. Why, if 10 years ago people thought that CCRCs were a good idea, has so little happened so far?

In Section 6.2 the authors draw attention to a number of risks connected with the land on which the CCRC is built, including property inflation. However, they do not consider whether property itself is a problem. The major problem may be in finding the right parcel of land in the right place at the

right price. This problem is possibly much greater in the U.K., with its high population density and strict land use legislation, than in countries like the U.S.A. or South Africa. The situation may change with the changes to the Green Belt now under consideration, but could remain important, simply because of the high population density. I would have been interested in a further sensitivity in Tables 7.1 and 7.2, reflecting, say, doubled or trebled land costs, as an indication of the financial effect of developing the CCRC, not near York, but in the home counties. This would indicate the need for an additional way of providing development financing which would be either, as in the U.S.A., by way of a bond issue, or possibly by way of requiring larger deposits from prospective initial residents of, perhaps, up to 25% to 50% of the cost of the bungalows.

The role of insurance should be studied carefully. In the U.S.A. long-term care insurance is important in what the authors define as Type B or Type C communities, where the fees do not cover all care. Where the community does provide extensive care, often there is not very much recourse to insurance. As the authors say in ¶6.1.8, for such a CCRC the offer of care is part of its core business. Do you insure your core business? If you do, is there not a danger that you will pay any profit margins over to the insurer, or that the insurer's interests and your interests will inevitably conflict? The authors draw attention to this by the fact that, if your nursing home is full, you may wish to extend the care in the bungalow. Here the interests of the insurer may be different. I suspect that, as other speakers have said, possibly re-insurance is more important in the form of high level stop loss or excess loss cover.

Mr D. J. Le Grys, F.I.A. (closing the discussion): The paper starts out with the assumption that a CCRC is attractive to members. The opener asked whether that was right. She quoted some figures from the U.S.A. that, if there were x number of people in CCRCs and y people with long-term care insurance policies, and you apply that North American ratio to the LTC policies in the U.K. of 35,000, then the conclusion is that not many people are going to be interested in CCRCs. This is not quite right, because LTC policies have not yet developed in the U.K., and the concept of CCRCs is not well known in the wider population.

My own view is that the CCRC concept will be quite popular, and, as Mr Ryan said, it is an attractive service to many, but not all, elderly people. Mr Snelson suggested that it is not going to be the major provider of services, but it could be a significant service. Mr Sturge pointed out that what you get from the CCRC is secure housing, care, leisure and independence. That is a very attractive concept to a high percentage of elderly people.

You also get good value for money. This can be seen from the sums and the costings of the case study CCRC. The question then comes: "would you get good value for money from a commercial CCRC organisation?" You would, at least, relative to other financial products that you can buy in the market now. If you had a house and you wanted to purchase care services for your old age, what could you do? In practice, all that you could do is to take a reversion on your house and use that money to pay for a long-term care single premium policy. That is poor value for money, because the reversion company is discounting at a high rate of interest and the long-term care insurer is applying a relatively low rate of interest in his policy terms. So, the interest difference is probably around 2% or 3%, and when that gets discounted down over a period of years the divergence in value becomes very wide indeed. The divergence is small for a person aged 98, but is very wide for a person aged 70. Practical examples in the U.K. at age 70 show that a person has to give away such a high percentage of the value of his or her house that such a financial product is not worthwhile.

So, I suggest that a commercial CCRC, which is using only one rate of interest in its discounting, only having one set of profit margins, one set of contingency margins, and one set of commissions, is likely to offer good value for money compared to other financial products in the market today. A commercial CCRC may come second to the case study CCRC, but it will not be a poor second, and it will be attractive relative to other products on the market.

The authors ask the question: "what about the sponsors?" The Rowntree Foundation's interests are laudable, and are very clear, but would other organisations want to develop CCRCs? Would the potential profit-to-risk balance be attractive enough? The sponsor would be least vulnerable to loss if the scheme was organised on a refundable membership fee, and if the annual subscription could be

varied to meet changes in care costs. The technical risk on that arrangement is limited, though there are other major business management considerations and problems to overcome in the long term.

The degree of risk is heightened, apparently, if the annual subscription is limited to RPI + 3%. The major component of the service charge is wages or other costs linked to earnings rates. The risk is not onerous. Over the last 40 years, the relationship between growth of earnings and RPI inflation shows that earnings growth was ahead of RPI by about 2.1% p.a. on average, but it fluctuated. In one case earnings were 6% higher than RPI, and on another occasion RPI was 6% higher than earnings. So if a CCRC was to give that guarantee, then there will be periods when the guarantee comes into play and a reserve should be held against that contingency. There were 14 occasions in the 40 years where earnings exceeded RPI + 3%, but on most occasions it was for one year only, and the position stabilised in the next one or two years. There were only two periods where there were short runs of two or three years where earnings stayed ahead of RPI + 3%. Therefore, it is quite easy to calculate a reserve, and a sufficient reserve would probably be in the region of 5% to 10% of the annual service charge. The authors point out that there is also a mitigating factor, that if the organisation that provides the service also owns the property, then, although earnings might outstrip RPI + 3%, the value of the property portfolio will rise, and the rise in property price will give a profit to compensate for loss on the annual service charge.

So, on the basis that the CCRC offers services on a refundable basis, and on an annual service charge basis, then there is limited technical risk. There is, as the authors point out, a whole range of general management problems, but they should not be insurmountable, and some organisations would be interested, especially if they were already in the care business, such as residential homes, nursing homes or providers of domiciliary care. Perhaps insurance companies wishing to move into long-term care provision and long-term care insurance would be interested to give an added dimension to their overall service. We have already seen major insurers moving directly or indirectly into the provision of care services.

Mr Seymour suggested, and Mr Werth also mentioned, that there could be co-operation between the public sector and the private sector. Such co-operation may well be in one direction in the years ahead, with the state, perhaps, taking the role as provider of the last resort, if all else fails.

A CCRC operation on a refundable basis and with the ability to alter the annual service charges should be attractive to some sponsors. However, operating a CCRC on a non-refundable basis and on pre-funded contributions, a lump sum instead of the annual service charge, looks dangerous and full of risks. The authors point out the difficulties in Sections 6.2 to 6.4. The organisation appears to offer to deliver care services on guaranteed terms. They are, in fact, transacting insurance business. It is a perfectly valid question that Mr Moran raised when he asked what the attitude of the DTI is to the CCRCs which actually provide insurance cover, and provide this on guaranteed terms.

There are two real dangers in giving guaranteed terms. First, as the opener pointed out, there are little or no data on which to base charges or premiums. There are no existing data in the U.K. I would be unwilling to give guarantees based on data from other countries, where the social climate and the way of life may be quite different from the U.K.

Despite what Mr Seymour said, that re-insurers should go back to giving guarantees, in practice there is no way that a re-insurer is going to give extensive guarantees when the re-insurer has such limited data on which to base its assessments.

The other reason why I am hesitant about taking data from another country is the degree of informal care provision. In the U.K. there could be a big shift in attitude to the provision of informal care, which is now estimated to be around 70% of care for elderly people provided by relatives and friends. If a person moves into a CCRC, the informal carers may not be prepared, and may not see it as their duty or as their responsibility, to provide care informally, but consider that this should be the CCRC's role. How should a CCRC's charging structure be changed for this change in attitudes? There are great dangers to a CCRC in shifting that balance between formal and informal care.

Another danger with guaranteeing terms is that there could be changes in expectations leading to escalating care costs in the future. We have seen this happen in acute care in the National Health Service. There has been tremendous growth in medical procedures, such as hip replacements, coronary by-pass operations, and organ transplants. The cost of acute care has escalated, and has become more

expensive as more people demand and expect these routines and procedures. If people in care demand more hours of care, better facilities, better quality staff, more entertainment, and so on, there could be a very rapid escalation in CCRC costs over the future. The Rowntree Foundation are wise to limit the proportion of business that they will conduct on non-refundable business and on pre-funded contributions to low levels.

The comments made by Mr Snelson and others on regulation, financial modelling and actuarial certification are very relevant, and I support the fact that the buyers going into CCRCs need adequate protection. There should be regulation for consumers and for long-term care policies. These insurance policies are very significant investments that people are making for the long term. However, there are, at present, unregulated products being sold by unregulated salesmen using unregulated markets and practices. Thus, there is scope for a mis-selling disaster or a scandal to emerge. There should be less danger for a consumer entering a CCRC, but there should be regulation and sound practices like those adopted by the Joseph Rowntree Foundation.

Mr R. A. Humble, F.I.A. (replying): There were a few general points that seemed to flow through a number of different contributions. Mr Sturge referred to the need to provide care to individuals in the bungalows. This is absolutely fundamental, because this is not about money only, but about what people want. The concept of providing people with what they want in the circumstances and in surroundings which are attractive to them is fundamental to this. This is not just a contractual, financial issue; it is looking after a large part of people's lives. The opener referred to the issue of potential mass exits from communities. Again, that just focuses on the point that we are not simply talking about fulfilling a financial contract of insurance, but talking about a management process for delivering people's expectations for the remainder of their lives.

There were references to the relevance of U.S. data, and I agree that there is a problem with these. There is a fundamental problem that, even if one had credible U.K. data, the fact that you are trying to make estimates about what is going to happen in 15 or 20 years' time, which is when your major liabilities are going to emerge, does not give you much comfort that what you have now is a good guide to that estimation. Nonetheless, I agree that U.S. data are imperfect estimates, and as soon as we start building up credible data in the U.K., we should pay a lot of attention to that. Certainly, we should make sure that we collect all the data that are available.

I agree that ageing is a problem. It is not simply a question of getting the right financial structure to deal with ageing, but also of what the CCRC is about. What did people think they were going into? They may not want to buy into a community of the very old, and new entrants may not be attracted to entering a community of the very old.

Mr Gatenby referred to long-term care insurance and its slow take-up. I am not sure about the linkage between the long-term care insurance issue and CCRCs, but there are many differences between the U.K. and the U.S.A., and, therefore, I am not sure how relevant U.S. experience is to the U.K. A potential problem of long-term care insurance is that it might not appear attractive because it is relatively expensive for something which may not happen to the insured, and, therefore, the benefits of it may never be seen. Although the annual charges for a CCRC may appear high for those who are in good health, there are many other ways that they are immediately appreciating the benefits of the community, and that may mean that it is not directly comparable to long-term care insurance in terms of how people perceive it.

Mr Bessell made some interesting comments on the need to involve members in the management of the community. I agree that CCRCs are not a simple financial issue, but the aim is to provide help for people to get through the remainder of their lives and provide them with what they need in order to do that. He also commented on the high level of fixed costs and associated risks. The high fixed costs and associated risks are very clear, and it is critically important that CCRCs are run only by organisations with substantial resources which are able to bear the losses if, in spite of one's best endeavours, it all goes wrong.

Mr Eagles referred to the importance of land values and the ability to establish cost effective CCRCs in the home counties. I am not sure that this is such an insurmountable problem; I suspect that, in practice, the initial entrance fee will be paid by people selling a house and moving into a

CCRC which is pretty close to where they were living, and therefore the relative difference in prices will not be significant.

I was happy that Mr Le Grys agreed with us that commercial CCRCs, could be attractive, and we hope that we will see a flourishing of commercial CCRCs in the not too distant future.

Actuarial advice and financial modelling are critical to CCRCs, but we must not lose sight of the fact that they are only part of an extremely difficult management process which is involved in providing people with the surroundings that are going to see them through for the rest of their lives, in the circumstances and in the quality of care that they expected when they were entering the community.

The President (Mr D. G. R. Ferguson, F.I.A.): I thank all guests for coming to this discussion, and I hope that you found it of interest. You have certainly enriched the discussion for us by your presence. I thank all the speakers that have contributed to an extremely useful debate; and to all of you in the hall. You will agree that it has been an extremely interesting and useful debate, and by your presence here you have confirmed that this is an area of activity of increasing importance to the actuarial profession.

Most importantly, I thank the authors and the Joseph Rowntree Foundation for making this debate possible. You have written a fascinating paper which is of great interest to those of us who are not experts in the field, as well as to those who have an interest. You have led us all through an extremely interesting and enjoyable evening, and we thank you very much indeed.

WRITTEN CONTRIBUTIONS

Mr G. D. Clay, F.I.A. (who spoke at the meeting, and who subsequently submitted this amplified contribution as a replacement for what he said): I note that the references given by the authors of this most interesting paper are almost all American. I wish to offer some anecdotal comment about South Africa, where my parents-in-law have been in such a community for some 10 years.

There are many CCRCs in South Africa; some old charitable ones and, over the last 20 years, an increasing number of commercial ones. They have taken actuarial advice in many cases, particularly since some of the early CCRCs, promoted by property developers, got into serious difficulties. Incidentally, I believe that some of the mutual life insurers have promoted CCRCs for occupation by policyholders and retired staff.

Some 10 years ago my in-laws contemplated moving into a CCRC in their late seventies, and they asked for my comments on their chosen scheme. I therefore gave advice without benefit of relevant experience or a Guidance Note! What I looked for was an ongoing alignment of financial interest between the developer/operator and the residents.

The scheme is very similar, physically, to Hartrigg Oaks, with 100 + cottages (built in phases) surrounding a dining, etc. facility in an old manor house, with an attached frail care centre. However, the financial arrangements are rather different. Residents purchase a life tenancy in a cottage, and, on its eventual sale to another occupant, the manager receives 25% of the capital gain. The previous occupants (or their executors) determine the sale price, but market forces align such prices fairly closely, and the vacancy rate has rarely exceeded 5%. This financial structure encourages all occupants to maintain their property and the operator to maintain the common areas.

There is an elected residents' management committee, which influences matters affecting the common area, security, etc., and has some control over the amount of the monthly levy. However, there is no guarantee constraining growth in those levies, reliance being placed on this consultation and on competition between CCRCs.

When residents move to the frail care centre, there is a monthly charge for use of the facility. Medical Aid schemes, an almost universal insurance arrangement covering all medical expenses, frequently pay part of the nursing element of the costs. The proceeds from the sale of the cottage would meet frail care costs for some years, so financial problems are only likely to arise when one occupant needs frail care, but the spouse remains in the cottage. Ultimately there may be a need to

rely on the family for financial support. The frail care centre does not admit non-residents, and occupancy has fallen to as low as 60%. There seems little risk of demand exceeding 100%, and certainly not the 30% likelihood indicated for Hartrigg Oaks.

The need for actuarial involvement is limited by the simplicity of the financial arrangements, although the age distribution of residents obviously impacts on the demand for frail care and on the balance of the operator's income between monthly levies and the capital gain on resales. This clearly needs ongoing monitoring in the context of making adequate provision for major maintenance, but that is not an actuarial problem. I have not observed any obvious increase in the average age of residents over the last 10 years, and the financial structure has successfully withstood high annual inflation rates.

I see key attractions of this CCRC as: its preservation of independence for residents in a community without maintenance worries; and the ongoing alignment of interests between the operator and the residents, because they each share in any increase in the value of the cottages and all would suffer from an inability to complete resales because of excessive monthly levies. Those residents lacking DIY skills can always find a willing neighbour, one currently in demand being a retired surgeon in his late eighties.

The authors subsequently wrote: A number of contributors to the discussion queried the use of U.S. population data as the basis for CCRC projections in a U.K. setting. Whilst conceding the inherent problem of applying any data to settings other than their own, the following points should be made. The definitions of ADLs used by the 1982 and 1984 National LTC Surveys are not specific to the U.S.A., and, as they are not dependent on local medical practices or social and benefit structures, they should be applicable to the U.K. The population samples used were drawn from a database of Medicare enrollees, and were designed to be representative of the U.S. population over the age of 65, including those who were institutionalised. It is a valid point that overall U.S. morbidity may differ from U.K. morbidity, but, in the absence of significant transition probability data in the U.K., analysis based on the 1982 and 1984 National LTC Surveys represents, in our view, the best available starting point.

Mr Brace raised the issues of the division of development costs of a CCRC between generations of members and the equitable allocation of other expenses. In modelling our commercial CCRC, we took as the operator's aim the repayment of all development costs within 30 years of commencement. We considered that aiming for repayment over a period of longer than 30 years was inappropriate, in view of the uncertainties involved. These uncertainties are, in our view, greater in the U.K. than in the U.S.A., because of the lack of U.K. experience of these communities. For example, it is not known how attractive these communities may appear to potential second generation members. Hence, in our model the scale of the financial burden placed on the initial generation of members is based on the proportion of the community that they constitute at any time during this period. As regards other expenses, these were allocated according to the manner of their consumption, so that repairs were based on the number of occupied bungalows, and fixed non-care running costs on the number of individual members.

Several speakers suggested that the all-inclusive nature of Type A CCRCs would lead to problems of over-utilisation of the care facilities, and that rationing systems along the lines of Type B CCRCs would be essential. The U.S. experience is that Type A CCRCs show the lowest usage of care facilities, possibly as a result of more active management. Furthermore, it may be true that the traditional U.S. Type A CCRC regards taking the risk of long-term care as its core business. However, some operators may wish to specialise in providing care and accommodation, and hence want to involve an insurance company in taking the risk.

The popularity of both non-profit and commercial CCRCs in the U.S.A. continues to grow apace, with membership up from 220,000 in 1995 to almost 600,000 at the end of 1997. In the U.K. we are just starting out. However, by debating the ideas behind CCRCs and offering a high level of involvement in day-to-day operation and in long-term planning to prospective members, we may find a similar curve of rapid expansion awaits us.