Continuing Care Retirement Communities
An Empirical, Financial, and Legal Analysis

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1984
Published for the
Pension Research Council
Wharton School
University of Pennsylvania
by
RICHARD D. IRWIN, INC. Homewood, Illinois 60430

To our children:
Amanda, Cameron, & Tyler
and
Thandi & Sibongile

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ISBN 0-256-03125-8
Library of Congress Catalog Card No. 83–81175

Printed in the United States of America

1 2 3 4 5 6 7 8 9 0 M P 1 0 9 8 7 6 5 4

Chapter Five

Actuarial Assumptions Required for Financial Projections

■ The actuarial assumptions required to evaluate the long-term financial status of CCRCs are discussed in this chapter. They may be separated into three categories: (1) decrement assumptions, (2) new entrant assumptions, and (3) economic assumptions. Decrement assumptions are used to estimate the survival of CCRC residents, as well as their future living status, over time. These assumptions include mortality rates, morbidity rates (i.e., rates of health care utilization), transfer rates between different apartment units, and withdrawal rates. New entrant assumptions are used to estimate the characteristics of future entrants to the community. They include the distribution of entry ages, the probability that specific units will become occupied by a single resident versus two or more residents, and the sex of single and paired residents. Economic assumptions are used to estimate the community's future expenses and revenues, including the interest earnings on any invested funds.

DECREMENT ASSUMPTIONS

Mortality Rates

Mortality rates specify the probabilities of death for residents of CCRCs. Although they can be used to calculate life expectancies, which are useful for comparing mortality rate tables, such statistics are not particularly useful for performing financial analyses. Financial projections require assumptions about the probability of residents living to future years, not simply the average length of time a group of residents will live in a CCRC.

Mortality rates must have various characteristics. First, they must be based on age and sex, since younger residents have lower mortality rates than older residents and females have lower rates than males. Second, they must be established for different living statuses, since apartment complex residents have lower mortality than health care center residents. Third, a select period is often appropriate. A select period refers to a table of rates in which the rates for a new entrant to the community are *less* than those for a long-term resident of the community at the same age. Finally, a mortality improvement factor should be included to reflect decreases in future mortality rates (i.e., a generation mortality table). This refinement is consistent with the current trends in mortality rates at all ages.

Morbidity Rates

Taken alone, mortality rates do not provide sufficient information for estimating future CCRC costs. To properly estimate these costs, it is necessary to project future health care utilization so that the higher costs of health care can be reflected in the financial analysis. Health care utilization assumptions are referred to as morbidity rates. There are two types of morbidity rates for CCRCs. One type defines the probabilities of *permanent* transfer between different levels of care. The other defines the average number of *temporary*[1] transfer days spent in the health care center annually.

Permanent transfer rates tend to vary significantly among CCRCs. One factor contributing to this variability is that management policies have an influence on these rates. Communities that actively strive to keep residents in their apartments will have lower permanent transfer rates relative to those of communities that move disabled residents into the health care center fairly quickly. This factor again points to the drawbacks in using life expectancies for financial analysis. Two communities could have identical life expectancies but different management policies, resulting in different permanent transfer rates and different health care expense projections.

Morbidity rates for *temporary* transfers, which specify the expected number of days for all short-term transfers to the health care center during the year, are also required in developing financial analyses because many continuing care contracts allow residents to use the health care center on a temporary basis with no additional charges even though they tie up two units (both their apartment unit and a health

[1] A temporary transfer is one in connection with which the resident is expected to return to his or her apartment after a stay in the health care center.

care unit).[2] Hence, temporary utilization can have important cost consequences.

Apartment Transfer Rates

Apartment transfer rates specify the probabilities of transfer from one apartment unit to another (typically transfer to a smaller apartment after a spouse's death or permanent transfer to the health care center). These rates are also influenced by management policy. Based on discussions with several CCRC managers, it would seem that transfer rates tend to be low despite management policies and/or financial incentives for single residents to move to smaller apartments after the death or permanent transfer of a spouse. The reason given is that such moves are generally considered too traumatic for the survivor. Nevertheless, if transfers of this kind do take place for a given community, then any financial analysis must take this factor into account.

Withdrawal Rates

Withdrawal rates specify the probability that a resident will voluntarily leave the community. The financial consequences of withdrawal depend on the contractual provisions of the community. The financial impact of withdrawal is of little consequence for many CCRCs that provide refunds for less than five years. However, if the refund provision is extensive and/or a high incidence of withdrawal is expected, then this factor must also be considered.

METHODOLOGY FOR DEVELOPING DECREMENT ASSUMPTIONS

Decrement assumptions for an existing CCRC can be derived from an "experience study" of the community's historical records. The primary consideration in developing any actuarial assumption is the size of the data base from which historical experience is examined. The data bases for CCRCs are relatively small, by actuarial standards, since most communities are relatively new and small (the median age and size for CCRCs are 14 years and 245 residents, respectively). The small size of CCRCs means that no one community will have sufficient data to develop mortality and morbidity rates from its experience alone.[3]

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[2] The results of the empirical analysis indicates that 54 percent of the CCRCs did not charge residents additional fees (except for meals) for temporary utilization of the health care center.

[3] Most actuarial studies are based on thousands of lives. The "small group" problem associated with CCRCs also means that the methodology used to make population projections based on these assumptions should compensate for the possible misstatement of assumptions and the variability about the assumptions due to random deviations.

There are two ways of dealing with this data base problem: (1) combining the experience of several communities and applying actuarial techniques of mortality table construction to develop probabilities of decrement or (2) modifying a schedule of rates taken from a "base table" derived from a group of individuals likely to have characteristics similar to those of CCRC residents. The second approach is referred to as standardized mortality ratio method. Under either approach, a community should be monitored periodically in order to adjust the assumptions in light of its experience.[4]

The first approach has been used to develop mortality rates and life expectancies which serve as the basis for one state's (California) reserve calculation; however, this approach has limited application for CCRCs since admission policies vary greatly among them. Combining data from several communities assumes that the residents form a homogeneous group, which may be unlikely for different management groups and philosophies. It may be practical to combine communities under the same management that have similar admission standards, but for most CCRC experience studies, it is better that the community use its own data under the standardized mortality ratio approach.

The standardized mortality ratio approach, which is recommended for developing mortality rates for both apartment and health care residents and for developing permanent transfer morbidity rates, involves four steps. The first step is to select a set of rates appropriate for use as a base table. With regard to mortality rates, an insurance company annuitant mortality table is recommended as the base table. Rates in such a table are appropriate because both annuitants and continuing care contractholders are willing to make substantial up-front financial commitments to protect themselves from outliving their resources, and the members of both groups would be unlikely to purchase these contracts if they did not feel they were in good health. The two annuity tables used in such studies are the 1971 Individual Annuitant Mortality table (1971 IAM) and Table 1983a. Both tables are currently used as standards for determining reserves for individual annuity policies.

The base table to be used for permanent transfer morbidity rates is more problematic. Permanent transfer rates represent a type of disability status for continuing care residents. Insurance company disability tables are typically derived for the working population, and therefore standard tables do not exist for the elderly population (over age 65). Hence, the authors again recommend that the annuitant mortality tables be used as the base table. Although the overall level of rates will be adjusted substantially by the experience morbidity study, the mortality

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[4] For a detailed explanation of mortality table construction, refer to Robert W. Batten, *Mortality Table Construction* (Englewood Cliffs, N.J.: Prentice-Hall, 1978). A discussion of the standardized mortality ratio method is contained in R. C. Elandt-Johnson and N. C. Johnson, *Survival Modes and Data Analysis* (New York: John Wiley and Sons, 1980), pages 22–24.

table should have approximately the same shape as the true morbidity table.

The second step is to select the length of the observation period over which data are to be collected. The longer this period is, the more data there are. However, a long observation period may have the drawback of including prior trends that may not be consistent with the more recent experience of the community.[5] The observation period should be at least five years to generate a reasonable amount of data. On the other hand, the observation period probably should not include more than 10 years in order to reflect the most recent trends in experience.

The third step in the standardized mortality ratio methodology is to determine the life years of exposure for all persons who are (or were) members of the community. The term *life year of exposure* means one resident living in the community for one year. In addition, each life year of exposure should be categorized according to the resident's age, sex, and length of residency in the community so that rates can be developed along these dimensions.

The fourth step is to multiply the exposure data by the rates of decrement suggested by the base table. This generates the *expected* decrements, which are then compared with the *actual* decrements, resulting in an actual-to-expected ratio. This ratio indicates the required modification to the base table rates that is needed to reflect the community's historical experience.

The standardized mortality ratio methodology generally cannot be applied to developing morbidity rates for temporary transfers, apartment transfer rates, and withdrawal rates, since these rates tend to be unstable. Rates for each of these decrements must be derived directly from the community's data by dividing the actual decrements by the life years of exposure. Temporary transfer rates are generally stated as the expected number of days per 100 residents, a value that combines the frequency of temporary transfers with the length of stay (severity). Apartment transfer and withdrawal rates are generally expressed in terms of a single rate for all residents, ignoring age or sex differences.

RESULTS OF MORTALITY AND MORBIDITY EXPERIENCE STUDIES

Seven communities contributed data for the mortality and morbidity experience studies presented in this section. The rate schedules developed from these data are used at a later point in this book to study

[5] Over the past 20 years, the life expectancies for age-75 females in the general population have increased on average 11 percent per decade. *Life Tables*, vol 2, sec. 5, *Vital Statistics of the United States, 1978*, DHHS Publication no. (PHS) 81–1104.

various financial aspects of each community. The experience studies revealed several interesting characteristics regarding actuarial data for CCRCs. These characteristics were the accessibility and completeness of historical records, the longevity of CCRC residents, and hospital utilization by continuing care residents. The findings on each characteristic are explained with the following discussion of the data analysis.

Data Base Description

Table 5–1 presents four summary statistics from the seven case studies: earliest date of data, life years of exposure, number of deaths, and number of permanent transfers to the health care center.[6] The size of the total data base is small compared to the volume that is normally used for actuarial experience studies. The total life years of exposure are slightly more than 25,000.[7] Nevertheless, it is possible to use an existing table of rates, appropriately modified as described in the preceding section, to develop mortality and morbidity rates from the data of this volume.

The observation period, which is determined from the earliest date of data through 1981, does not necessarily coincide with the opening of the community. In a few cases, it was difficult, if not impossible, for the community to reconstruct historical data because records either were not kept at that time or were no longer available. Record keeping is an area in which the entire CCRC industry could benefit from standardization.

Life Expectancies

Even though life expectancies have limited usefulness for financial projections, these statistics are useful for comparing the mortality tables developed from each community studied. Moreover, life expectancy statistics offer information on whether CCRC residents live longer than their counterparts in the general population. The first step in developing life expectancies was to calculate actual-to-expected mortality ratios. These ratios were calculated for each age and sex, with no distinction being made for the resident's living status (aggre-

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[6] The health care center for Cases 3, 6, 7, and 8 includes both personal care and nursing care. The health care center for the other cases consists of nursing care only. Also, the numbering convention, which excludes 4, is used as a linkage to later analyses, which include a community numbered as "4" but exclude communities 7 and 8.

[7] This data base is relatively large for CCRC standards. The largest publicly available actuarial data base is the one used to develop the California Life Care Tables, and we estimate from data contained in the report that it was developed on slightly more than 45,000 life years of exposure. *Life Table Estimation and Financial Evaluation of California Life Care Homes,* Contract no. 77–60991.

TABLE 5–1
Size and Observation Period of Actuarial Data Base for Case Study CCRCs

Characteristics	Sex	Case 1	Case 2	Case 3	Case 5	Case 6	Case 7	Case 8	Combined cases
Date of earliest data	Combined	1974	1978	1975	1978	1971	1962	1962	
Life years of exposure	Female	2,435	1,361	2,157	696	2,786	3,985	6,632	20,052
	Male	422	238	678	259	1,131	941	1,385	5,054
	Combined	2,857	1,599	2,835	955	3,917	4,926	8,017	25,106
Deaths	Female	129	78	106	30	142	299	369	1,153
	Male	38	26	85	16	120	83	116	484
	Combined	167	104	191	46	262	382	485	1,637
Permanent transfers	Female	99	67	196	13	84	46	242	747
	Male	18	6	76	5	51	11	39	206
	Combined	117	73	272	18	135	57	281	953

gate rates). The base table for this comparison was a new mortality table used to calculate life insurance company reserves for individual annuities, referred to as Table 1983a. The actual-to-expected ratios are not shown; however, such ratios were used to generate the life expectancies presented in Table 5–2 along with the life expectancies for the general population (1978 U.S. Life Tables) and Table 1983a.

Table 5–2 shows that life expectancy for an age-75 female entrant is 14 years or more for five of the seven cases. Life expectancies for entrants to CCRCs are 3 to 26 percent longer than life expectancies for the general population. However, life expectancies for CCRC entrants are slightly less than life expectancies for their counterparts who purchase individual annuities (based on the 1983a Mortality Table). Male life expectancies tend to vary more than those of females, but this may be due in part to the smaller volume of male data. Life expectancies for age-75 male entrants range from 9.1 years to 11.7 years, values which are 6 to 36 percent greater than life expectancies for the general population.

The bottom section of Table 5–2 contains last survivor life expectancies for a female/male couple who are assumed to be the same age. The term *last survivor life expectancy* refers to the number of years that *at least one* member of the couple is expected to survive in the community. At entry age 75, the last survivor life expectancies for CCRC entrants are 14 to 25 percent higher than the corresponding single female life expectancies, and the differential increases with age. This observation supports the notion that there should be higher fees for a second person entering a CCRC unit.

Based solely on a review of life expectancies, CCRC entrants seem to live longer than the general population. This study does not address the question of whether this is due to a selection process (i.e., healthier persons moving into a CCRC) or is an effect that the retirement community environment has on residents. However, that question is an important area for further research.

Mortality Rates

Aggregate life expectancies are useful for comparing longevity among communities, but they are not sufficient for actuarial analyses. For financial analyses, it is necessary to define separate mortality rates according to the living status of the resident and to develop morbidity rates as well. Tables 5–3 and 5–4 show the results of such a mortality analysis. Table 5–3 contains "crude" death rates for apartment and health care residents, that is, rates derived by dividing the total number of deaths by the total number of life years of exposure. These represent a simple measure for comparing death rates among communities. For example, the combined (female and male) crude rates for apartment

TABLE 5–2

Life Expectancies for Entrants to Case Study CCRCs

Gender	Age	1978 U.S. Life Table	Table 1983a	Case 1	Case 2	Case 3	Case 5	Case 6	Case 7	Case 8
Female	65	18.4	23.7	22.6	22.7	19.8	21.9	22.7	22.8	23.1
	70	14.8	19.3	18.3	18.4	15.7	17.5	18.3	18.4	18.7
	75	11.5	15.0	14.0	14.1	11.8	13.4	14.0	14.2	14.5
	80	8.8	11.3	10.5	10.6	8.5	10.0	10.4	10.6	10.9
	85	6.7	8.2	7.5	7.6	5.9	7.0	7.5	7.6	7.8
Male	65	14.0	20.2	18.6	15.8	16.1	19.1	16.8	19.3	18.8
	70	11.1	16.1	14.7	12.2	12.5	15.2	13.1	15.3	14.9
	75	8.6	12.5	11.3	9.1	9.4	11.7	9.9	11.8	11.4
	80	6.7	9.5	8.4	6.6	6.8	8.8	7.3	8.9	8.6
	85	5.3	7.1	6.2	4.7	4.9	6.5	5.3	6.6	6.3
Last survivor*	65	—	27.9	26.4	25.3	23.2	26.1	25.6	26.8	26.8
	70	—	23.1	21.6	20.6	18.7	21.4	20.9	22.0	22.0
	75	—	18.3	17.0	16.1	14.3	16.8	16.3	17.4	17.4
	80	—	14.3	13.1	12.2	10.7	12.9	12.4	13.4	13.4
	85	—	10.7	9.7	8.9	7.6	9.5	9.1	10.0	10.0

* Both entrants (a female and a male) are assumed to be the same age.

TABLE 5–3
Crude Mortality Rates

Living status	Sex	Case 1	Case 2	Case 3	Case 5	Case 6	Case 7	Case 8
Apartment	Female	3.1%	3.4%	3.3%	3.6%	3.1%	5.1%	3.6%
	Male	6.1	11.3	3.0	5.5	7.3	8.1	6.6
	Combined	3.6	4.6	3.2	4.1	4.3	5.7	4.2
Health care	Female	26.8	25.3	26.2	27.3	29.3	27.8	17.0
	Male	46.7	6.2	41.6	50.0	51.8	30.0	26.2
	Combined	29.1	23.4	29.6	30.8	25.8	28.3	18.2

residents indicate that 3 to 6 of every 100 continuing care contract holders will die annually. The combined health care rates are 4 to 9 times higher, ranging from 18 to 36 deaths per 100 residents. In virtually every case, the crude rates for females are lower than those for males. The exceptions are probably due to the small size of the data base.

Crude rates are useful for rough comparisons, but they are not sufficient for developing mortality assumptions since they do not take age and sex differences among residents into account. A more sophisticated measure adjusts for the age and sex of residents. The results of this measure, based on Table 1983a, are presented in Table 5–4. By

TABLE 5–4
Age/Sex-Adjusted Actual-to-Expected Mortality Ratios
(based on Table 1983a)

Living status	Sex	Case 1	Case 2	Case 3	Case 5	Case 6	Case 7	Case 8
Apartment	Female	70.4%	73.0%	61.7%	104.0%	72.3%	101.3%	81.1%
	Male	85.7	173.8	42.4	100.2	102.5	102.3	96.7
	Combined	73.8	93.6	55.8	102.6	84.3	101.6	85.0
Health care	Female	368.9	270.3	350.6	487.4	433.2	258.9	179.6
	Male	349.1	69.7	428.3	682.1	533.0	301.1	247.8
	Combined	365.0	251.2	371.5	524.8	470.1	267.1	188.1

way of example, female apartment residents in Case 1 show an actual-to-expected ratio of 70.4 percent of the Table 1983a rates. If the death rate from that table for an age-75 female is 2.01 per 100, then the derived rate is 1.41 per 100 (2.01 × 0.704). This table shows that apartment resident mortality rates for most cases (five of seven) are less than that suggested by Table 1983a. Health care residents experience significantly higher mortality, ranging from 2 to 5 times that suggested by the annuity table.

Morbidity Rates

Also required for actuarial analyses are morbidity rates, or rates of health care utilization, which are needed to make the tie between apartment and health care mortality rates. Morbidity rates are categorized as permanent transfers, where the resident releases his or her apartment, and temporary transfers, where the resident retains the apartment unit.

Crude morbidity rates and age/sex-adjusted actual-to-expected ratios for permanent transfers are presented in Table 5–5. This table

TABLE 5–5
Crude Morbidity Rates* and Age/Sex-Adjusted Actual-to-Expected Morbidity Ratios *(based on Table 1983a)*

Ratio	Sex	Case 1	Case 2	Case 3	Case 5	Case 6	Case 7	Case 8
Crude morbidity ratios	Female	4.4%	5.5%	11.8%	1.9%	3.3%	1.2%	4.2%
	Male	4.6	2.9	13.7	2.0	4.9	1.3	3.1
	Combined	4.5	5.1	12.3	1.9	3.7	1.2	4.0
Actual-to-expected ratios	Female	76.9	117.4	215.0	56.8	75.3	25.2	93.8
	Male	54.4	45.1	187.1	36.6	69.3	13.0	45.6
	Combined	72.3	103.7	206.4	49.2	72.9	22.0	81.8

* Rate of permanent transfer to the health care center (either personal care or nursing care).

shows that female crude permanent transfer rates are approximately equal to those of males for five cases. This observation appears to be corroborated by the comparison of age/sex-adjusted ratios. Even though female ratios are consistently higher than male ratios, the permanent transfer rates derived from these ratios will be approximately equal since the underlying base rate for males is higher. However, female health care utilization is greater since they live longer after permanent transfer. It should be noted that this analysis shows considerably more variation than did the analysis of mortality rates, suggesting that it is not appropriate to combine the data from all communities to develop a single table because doing this would remove such variations.

Table 5–6 contains the results for temporary transfers. It shows the expected number of hospital days per year per 100 residents, the expected number of health care (both personal and nursing care) days per year per 100 residents, the probability of temporary transfer to the health care center, and the distribution of length of stay given that the resident temporarily transfers.

An interesting finding regarding temporary transfers is the expected length of stay in an acute-care hospital. There is a belief among some CCRC administrators that their residents, whose average age is approximately 80, utilize hospital services on a less frequent basis than do their counterparts in the general population. The first row of Table

TABLE 5–6
Hospital and Temporary Health Care Utilization by Residents of Case Study CCRCs

Statistic	Sex	Case 1	Case 2	Case 3	Case 5	Case 6	Case 7	Case 8
Expected number of hospital days per year per 100 residents	Combined	373 days	—	151 days	67 days	100 days	—	250 days
Expected number of health care days per year per 100 residents	Female	1,074	1,251	280	656	1,222	810	1,164
	Male	673	1,595	170	583	825	870	1,166
	Combined	1,014	1,302	230	638	1,114	821	1,164
Probability of temporary transfer	Combined	35%	37%	18%	12%	13%	22%	34%
Distribution of length of temporary stay	Combined							
1–14 days		59%	42%	71%	20%	43%	48%	65%
15–29 days		21	22	14	30	16	16	14
30–59 days		14	22	9	20	14	16	10
60–179 days		4	14	5	27	14	17	9
180 days and over		2	0	1	3	13	3	2
		100%	100%	100%	100%	100%	100%	100%

5–6 shows that the expected number of hospital days per 100 residents[8] ranges from 67 to 373 days. The upper value of this range is slightly less than the national average of 380 days for Medicare patients over age 65.[9] However, the data from which these statistics are derived are fairly thin. This is an area worthy of additional investigation with the goal of determining whether potential cost savings may be associated with the care provided in CCRCs.

Table 5–6 shows a large range in the expected number of temporary health care days per 100 residents, from a low of 230 days to a high of 1,595 days. Removing the outlier of 230 days for the second oldest community, there appears to be a slight association between the expected number of days and the age of the community (younger communities showing lower averages). The probability of transfer during the year also varies significantly among the communities. The highest probability, for Case 2, is 37 percent, and this case also has the highest expected number of temporary days. The distribution of the length of a temporary stay is skewed toward the lower end, with 50–80 percent of the transfers lasting less than 30 days for all cases.

Observations from Experience Studies on Decrement Assumptions

One of the primary findings of the mortality and morbidity case study investigations is that the historical records of the case study CCRCs were reasonably complete. Those communities that had good records put forth a substantial effort to maintain them. The second finding was a conformation of the view that residents of CCRCs tend to live longer than their counterparts in the general population. No explanation can be advanced from this finding, but this is an area that merits more research. Finally, it appears that CCRC residents tend to have lower hospital utilization than the general population.

NEW ENTRANT ASSUMPTIONS

New entrant assumptions are used to specify the characteristics of replacements for apartment residents who either die or permanently transfer to the health care center. These assumptions are required in projecting future population flows since differences in entry ages and in the number of coupled entrants will affect the community's apartment turnover and health care utilization.

[8] This statistic combines frequency of transfer with the average length of stay given that the resident transfers.

[9] David Rothberg, ed., *Regional Variations in Hospital Use* (Lexington, Mass.: Lexington Books, 1982).

Entry Age Distribution

The entry age assumption has a significant impact on future population flows and, in turn, on the financial aspects of a CCRC. Many forecasts use an average entry age assumption; however, this simplification could lead to errors in financial planning since health care utilization and the expected number of years a resident will occupy an apartment vary according to entry age. More accurate financial forecasts will result in the use of entry age distributions that specify the percentages of residents that enter from a range of ages, typically 65 to 90.

Table 5–7 shows the entry age distribution for the seven case studies. The average entry age is consistent for all cases, even though there are wide geographic and age variations in the communities. For both females and males, it is 76 or 77. However, there is variation in the actual distribution of ages. This variation should be reflected in assumptions used to project future populations and to determine weightings for fees that do not reflect cost differences associated with entry age.

Gender Distribution for Entrants

This assumption refers to the percentage of single entrants who are female and to the sex of members of double occupancies (i.e., the number of paired entrants who are of the same sex versus the number who are of the opposite sex). This distribution is needed because females are expected to live longer than males, and possibly use the health care center more, a factor that affects the financial aspects of the community.

Double-Occupancy Percentage for Entrants

This assumption reflects the probability that new entrants to an apartment unit will consist of two persons. This probability varies according to the size of the unit and may also be affected by management policies (e.g., a policy to sell certain units only to couples). The double-occupancy percentage is used to project the financial consequences of having two persons live in an apartment.

ECONOMIC ASSUMPTIONS

Inflation Rates

An estimate of future inflation is required for forecasting the increases in various expenses associated with operating the community and the expected increases in various revenue sources, primarily monthly fees

TABLE 5–7
Entry Age Distributions for Entrants to Case Study CCRCs

Sex	Age range	Case 1	Case 2	Case 3	Case 5	Case 6	Case 7	Case 8
Female	64 and younger	1%	2%	5%	3%	5%	2%	4%
	65–74	36	34	30	43	35	42	42
	75–84	56	54	50	44	52	54	51
	85 and older	7	10	15	10	8	2	3
	Average	77 years	77 years	77 years	76 years	76 years	76 years	75 years
Male	64 and younger	0%	1%	4%	4%	4%	0%	4%
	65–74	33	35	25	37	32	46	39
	75–84	55	52	57	48	50	49	53
	85 and older	12	12	14	11	14	5	4
	Average	77 years	77 years	78 years	77 years	77 years	76 years	76 years

and entry fees. Since financial projections may involve a 20–30-year forecast of inflation, one should not be overly myopic with respect to recent inflation experience in making this estimate. While it is important to reflect recent inflation experience, it may be unwise to project the recent high experience over a long period of time. One approach is to select a graded inflation assumption, for example, starting at 10 percent in the first year and grading down to a long-run rate of 5 percent after 5 years.

In addition, the inflation rate used in financial forecasts need not, and probably should not, be an estimate of the CPI statistic. The CPI tends to overstate the true inflation rate in an environment of accelerating inflation and to understate it in an environment of decelerating inflation. The proper assumption to use is the community's internal rate of inflation, which may be substantially different from published indices such as the CPI. Moreover, in establishing the inflation assumption, it may be important to select different inflation rates—at least in the short run—for different categories of expenses and revenues. For example, health care expenditures have historically increased faster than other community expenditures, and this trend may continue. However, the authors caution against the use of a permanently greater rate of inflation on one component of expenses (or revenues) as compared to another component, since a difference in inflation for a period of 20 to 30 years can cause significant distortions.

There is no doubt that the inflation assumption is both difficult to select and important to the results of the financial forecast. It is therefore recommended that financial forecasts involve a sensitivity analysis which considers various optimistic and especially pessimistic scenarios. Generally speaking, if the inflation assumption enters into both revenues and expenses equally, the absolute value of the rate may be less crucial than one initially believes, a subject examined at a later point. There is without question, however, a major impact on the long-run financial forecasts of a community when the rate of inflation for revenues is different from the rate of inflation for various expense categories. If such scenarios make sense, then the authors recommend that extensive sensitivity analyses be performed.

Interest Rates

The second economic assumption is an estimate of future interest rates. This assumption is required for two reasons. The obvious reason is that, if the community has substantial cash balances (e.g., various reserves), it is important to take into account the expected interest returns on these funds. The second reason is that some of the financial analyses to be discussed later require the determination of today's value of money payable (or receivable) in future years. In order to assess properly the current worth of these future transactions, it is necessary to discount their value for the so-called time value of money. Consider a case where $1.10 is payable next year and the current rate of interest is 10 percent. The present value (or today's value) of this payment is $1. This is true because $1 invested at a 10 percent interest rate will indeed accumulate to $1.10 after one year. Similarly, $2.59 payable at the end of 10 years has a present value of $1, assuming a constant 10 percent interest assumption.

Interest rates are as difficult to select as inflation rates. The financial literature, however, indicates that over a period of years the real rate of interest on short-term securities, such as Treasury bills, is near zero. The real rate on intermediate and long-term fixed-income securities is between 2 and 3 percent. The expected rate of inflation is added to the real rate of interest to obtain the nominal rate of return, which is used in actuarial computations.

Thus, the selection of the inflation assumption should act as a guide in the selection of the interest rate. For example, if the inflation rate were selected as the graded example given above (i.e., 10 percent down to 5 percent over five years), then it might be reasonable to make an identical assumption for the short-term interest rate. On the other hand, short-term interest rates tend to follow the CPI, and if the community's inflation exposure is different from the CPI, there may be justification for having an interest rate different from the inflation rate. Again, as with the inflation assumption, it is wise to perform sensitivity analyses with regard to the interest assumption because of its potentially significant impact on the financial analyses of CCRCs.

Summary

This chapter discussed the types of actuarial assumptions needed for analyzing the long-term financial status of CCRCs. In this discussion, three categories of assumptions were described, and illustrative values were derived for several actual communities. There is a definite need for the development of a national, or regional, data base from which guidelines can be drawn in selecting the assumptions to be used for financial analyses of CCRCs. The development of CCRC morbidity rates is especially needed because, as this chapter points out, it is impossible to reflect the financial consequences of a continuing care contract with accuracy using only life expectancies and mortality rates. The actuarial assumptions to be used in making financial projections for the hypothetical community examined in the following chapters of this book are contained in Appendix B. ■