Actuarial Science and the CCRC

A Useful Framework for Making Decisions

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Our Presentation Process

- Review learning objectives
- Case studies
- Predictions for the future
  - an interactive discussion
Learning Objectives

◆ How do we assess financial condition?
  ■ Credit-worthiness
  ■ Contract design
  ■ Mergers and acquisitions

◆ What information is needed for financial assessments in addition to GAAP?
  ■ Long-range financial planning
  ■ Planning for charitable needs
Learning Objectives (con’t)

◆ Can we improve the resident underwriting process as it relates to contract selection?
  ■ Long-range financial planning
  ■ Health care utilization

◆ What types of data will the CCRC need in 2010?
  ■ Health care utilization
Case Studies

- Credit-worthiness
- Long-range financial planning
- Health care utilization
- Planning for charitable needs
- Contract design
- Mergers and acquisitions (appraisals)
Credit-worthiness

◆ Situation
  ■ An experienced operator wants to develop a “green field” CCRC at lowest financing rates

◆ Process
  ■ Actuarial feasibility study needed to obtain approvals from letter-of-credit banks

◆ Results
  ■ $100M financing with 100% variable debt
Credit-worthiness: Process

- Collect demographic data on pre-sales
- Review operational statistics thru fill-up
- Obtain financing sources and uses of fund
- Actuarial test adequacy and “equity” of fees for various contract options
- Test ability to meet financing covenants
- Make final pricing recommendations
Entry Age Distribution

Female Avg=76.3  Male Avg=77.9
Double Occupancy Percentage

![Bar chart showing the percentage of occupancy for different unit types: One BR, Two BR, Three BR, and Villa. The chart indicates that Villa has the highest percentage of occupancy, followed by Three BR, Two BR, and One BR.](chart.png)
Uncloaking the Actuarial Black Box

- CCRCs are really small managed care (insurance) companies
- Entry fees are simply a prepayment of future monthly fees
Simple Actuarial Model (S.A.M.)

- Perfect knowledge
- Costs of services by level of care
- Longevity by level of care
- Economic environment
  - No inflation
  - No interest earnings
S.A.M. Pricing Steps

◆ Select assumptions
◆ Estimate future costs
  ■ Operating costs
  ■ Expenses associated with fixed assets
◆ Define contract provisions
◆ Determine funding requirements
Assumptions for S.A.M. Costs by Level of Care

APT ALU SNF

<table>
<thead>
<tr>
<th>Level of Care</th>
<th>APT</th>
<th>ALU</th>
<th>SNF</th>
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<tbody>
<tr>
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<td>$3,070</td>
<td>$4,817</td>
<td>$4,953</td>
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APT - Assisted Living
ALU - Adult Day Care
SNF - Skilled Nursing Facility
S.A.M. Pricing: Fee-for-Service

◆ Charge monthly fees that equal costs
  ■ Resident pays $3,070 while in APT
  ■ Resident pays $4,817 while in ALU
  ■ Resident pays $4,953 while in SNF
  ■ No ($0) entry fee

◆ Also known as “rental” or “Type D” contract
S.A.M. Pricing: Costs and Fees for Rental

ILU  ALU  NC

Costs  Fees
S.A.M. Pricing: What if Fees are < Expenses

- New funding contract that sets monthly fees to be less than costs
- Additional information needed
  - Terms of funding provisions
  - How long a resident will live
  - Where a resident will live
S.A.M. Life Expectancy:
Age 79 Female

[Bar chart showing distribution of APT, ALU, and SNF]
Assumptions for S.A.M. Projection of Lifetime Costs
Assumptions for S.A.M.
Cumulative Lifetime Costs

$0 $100,000 $200,000 $300,000 $400,000 $500,000 $600,000

1 2 3 4 5 6 7 8 9 10 11 12
S.A.M. Pricing: Lifetime Costs

◆ Total lifetime costs = $508,236

- 9 \times $36,840 = $331,560
- 1 \times $57,804 = $57,804
- 2 \times $59,436 = $118,872
S.A.M. Pricing: Lifecare Contract

◆ If resident wanted to pay level monthly fees, what entry fee should be paid at move-in

◆ Resident can afford $2,000/month while in apartment and $90/day after transfer

◆ Also known as “continuing care” or “Type A” contract
Total Costs and Monthly Fees by Level of Care

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<th>Level of Care</th>
<th>Costs</th>
<th>Fees</th>
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<td>APT</td>
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<tr>
<td>ALU</td>
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</tr>
<tr>
<td>SNF</td>
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<td>$4,000</td>
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</table>
Annual Total Costs and Monthly Fees

![Bar chart showing annual total costs and monthly fees.](image_url)
EF = Total Costs minus Monthly Fees

24
S.A.M. Pricing:
Calculating Lifecare Fees

Lifetime Cost = $508,236
Monthly Fee = $2,140  2,738
(×) 12 Months per Year = × 12 12
$25,680 32,856
(×) Expected Lifetime × 9 3
Net Costs $231,120 + 98,568
(-) Derived Entry Fee = $178,548
S.A.M. Pricing: Expressing Fee Adequacy

- New entrant pricing test; compare future costs (actuarial liabilities) with combination of entry fee plus monthly fees (actuarial assets)
- \( \frac{\text{Assets}}{\text{Liabilities}} - 1 = \% \text{ Surplus/Deficit} \)
Refinements to SAM

◆ Adjustments for real world
  ■ CCRC contains many residents
  ■ Inflation and interest earnings
  ■ Uncertainty about life expectancies
  ■ Variations in costs by:
    ● Size of units
    ● Number of occupants
    ● Age of occupants
    ● Refund provisions
Projected Cash Flow Ratios

![Graph showing projected cash flow ratios for years 2002 to 2008. The graph includes columns for Debt Service, Cash-to-Debt, and Min Liquid. The years 2004 and 2005 show significant increases in Debt Service compared to other years.]

Legend:
- Orange: Debt Service
- Yellow: Cash-to-Debt
- Blue: Min Liquid
Long-term Financial Planning

◆ Situation
  ■ In 20-year old facility, management is experiencing difficulty in selling smallest units

◆ Process
  ■ Determine the maximum number of combination units that are viable

◆ Results
  ■ Financial position supports 100% combos
CCRC Financial Management

◆ Accounting Standards

■ Indicate financial condition as a result of operations to-date

■ Compare financial position from period-to-period and between similar organizations
Actuarial Standards

- Assess long-term solvency
- Provide early warning of potential problems
- Project cost of long-term health care needs
- Compare financial position associated with alternative assumptions for future scenarios
Future Services Obligation (Accounting)

- Reflect losses from unprofitable contracts when incurred
- Control recognition of entrance fees into income

= Liquidation Liability
Actuarial Valuation (Actuarial)

- Calculate target reserves
- Compare to current reserves

= Going Concern Liability
CCRC Financial Management

◆ Annual budget is short-term planning

◆ Long-term planning includes:
  - replacement of fixed assets
  - servicing debt
  - meeting future demands
  - recognition of inflationary impact on reserves
Objectives of Budget Process

◆ To set revenues to exceed expenses?
◆ To provide a method of control for meeting operating objectives?
◆ To ensure the short-term financial health of the organization?
Limitations of Budget Process

- Amortization may reflect too much income
- No way to quantify by how much revenues should exceed expenses
- Issues with future service obligation
  - Real obligation is sum of deferred entry fees, refund liability, plus accounting obligation
  - Calculation is a liquidation value
Financial Statement Implications

◆ Accounting objectives are revenue and expense matching
◆ Actuarial suggests that most of entry fee should be earned (recognized as income) in later years and “risk pooling”
◆ GAAP recognizes more income in earlier years and no “risk pooling”
Amortization of Entry Fees for a Lifecare Contract

$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0

1 2 3 4 5 6 7 8 9 10 11 12

Actuarial  GAAP

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Deferred Revenue (Unearned) from Entry Fees

SAM Def Rev  GAAP Def Rev
CCRC Financial Management

- CCRCs need financial and actuarial models:
  - Continuing care contracts are long-term commitments
  - Timing of revenue inflow does not match expense outflow
  - Management needs to know long-term impact of today’s decisions
CCRC Financial Management

- Performance Targets
  - Operating Ratio
  - Debt Service Coverage Ratio
  - Cash to Debt Ratio
  - Actuarial Funded Status
Components of Long-term Financial Planning

- Actuarial valuation or balance sheet
- Adequacy PV test of new entrants’ fees
- Cash flow projection
Do Resident Pay Their Fair Share of Costs?

$ 47.4 million in apartment costs
+ $ 17.2 million in assisted living costs
+ $ 53.0 million in nursing care costs
+ $ 1.2 million in refunds
- $ 67.5 million monthly fees
- $ 55.0 million in reserves

= $ 3.7 million actuarial surplus (103.1% funded)
Funded Status Before and After Maximum Combos

Max Combos

Baseline

90% 95% 100% 105% 110%

103.1% 100.5%
Health Care Utilization

◆ Situation
  ■ Nursing center outdated, many residents leave facility to obtain services

◆ Process
  ■ Develop scenarios reflecting new services

◆ Results
  ■ Decision to tear-down and build new assisted living and dementia
Health Care Utilization

How many assisted living and nursing care beds do we need?

- Mortality rates - rates of death by level of care
- Morbidity rates - rates of transfer to higher levels of care
Experience Study

Actuarial analysis to set mortality and morbidity based on:

◆ Age, gender, couple status
◆ Assessment of functional status (future enhancement)
Demographic Assumptions

◆ Average ILU entry age: 78
  ■ Increase 1 year every 5 years
  ■ Increase 2 years every 5 years for aging-in-place acceleration due to home care in ILU
Utilization Assumptions

Internal service needs $\rightarrow$ utilization

- Past experience
- Current trends
  - ALU dementia
  - Increase home care
  - ALU dementia and home care
Life Expectancies by Level of Care

Past Experience
ALU Dementia
Home Care
ALU & Home Care

ILU ALU NC
Probability of Transfer

Past Experience

ALU Dementia

Home Care

ALU & Home Care

0% 10% 20% 30% 40% 50% 60%

NC ALU
Population Projections

Actuarial population projection will generate:

- ILU turnover
- ALU residents
- NC residents

Past Experience: Scientific

Current Trends: What-if
Independent Living Turnover
Is Health Care Capacity Adequate?

Past Experience
- ALU
- NC

ALU Dementia
- ALU
- NC

Home Care
- ALU
- NC

ALU & Home Care
- ALU
- NC
Health Care Prevalence & Distribution

- Past Experience: 8% ALU, 16% NC
- ALU Dementia: 12% ALU, 12% NC
- Home Care: 6% ALU, 16% NC
- ALU & Home Care: 9% ALU, 13% NC
Why do Functional Assessments?

Determine risks based on functional status to better:

- Predict service needs for staffing and HC capacity
- Perform risk-based underwriting
- Screen for appropriate contract type at admission
Health Care Utilization Summary

Projections of health care needs are influenced by:

- Management philosophy regarding aging-in-place
- Number and mix of health care beds
- Availability of home care services and private duty nurses
Health Care Utilization Summary

Potential impact of current trends:
◆ More assisted living/AL Dementia - shift some NC utilization to AL
◆ More home care - shift some AL utilization to ILU
◆ Assessments/Interventions/Wellness Programs - reduce overall HC utilization and costs?
Planning for Charitable Needs

◆ Situation
  ■ Increase in requests for charitable assistance

◆ Process
  ■ Determine required benevolent fund needs

◆ Results
  ■ Targets developed for contributions and distributions
Planning for Charitable Needs

Financial Aid Risk:

◆ Are benevolent funds adequate to provide financial assistance for current residents?

◆ How do you evaluate risk for new entrants?
Risk Management

- Contract provisions - protect against willful mismanagement of assets

- Financial screening - qualify residents financially before entry into community
Risk by Contract Type

- All contract types have some form of risk
- Type A contracts have more health care risk, but less financial aid risk
- Type C contracts have less health care risk, but more financial aid risk
Measuring Financial Aid Risk

Compare resident’s income and assets to expenses

- **Income:** Social Security, pension, interest & dividends, draw on assets, long-term care insurance, Medicaid payments

- **Expenses:** CCRC fees, personal allowance (food, utilities, medical, clothes, gifts, travel, taxes)
Measuring Financial Aid Risk

Use actuarial projections rather than rules-of-thumb because:

- Need to estimate how long the resident will live in community (varies by age)
- If fees change by level of care, need to estimate when resident will transfer and how long they will live at each level
Financial Aid Projection - Female age 80

- Type A: $100,000 EF, $1,500 MF
- No personal allowance
- $200,000 Assets, $3,000 Mon. Income

Tot. Subsidy = $0
PV Subsidy = $0

- Type A: $100,000 EF, $1,500 MF
- PA: $1,000 IL, $500 AL, $300 NC
- $200,000 Assets, $3,000 Mon. Income

Tot. Subsidy = $150,000
PV Subsidy = $90,000
Financial Aid Projection - Female age 80

- Type C: $100,000 EF, $1,500 IL, $2,400 AL, $3,000 NC
- PA: $1,000 IL, $500 AL, $300 NC
- $200,000 Assets, $3,000 Mon. Income

Tot. Subsidy=$275,000
PV Subsidy = $150,000

- Type C: $100,000 EF, $1,500 IL, $2,400 AL, $3,000 NC
- PA: $1,000 IL, $500 AL, $300 NC
- $400,000 Assets, $4,700 Mon. Income

Tot. Subsidy=$0
PV Subsidy = $0
Financial Qualification

What criteria should we use to qualify a resident financially?

- Demonstrate reasonable and objective qualification process
- Consider community goals and philosophy
- Determine adequacy of current benevolent funds
Adequacy of Benevolent Funds

Are current charitable obligations funded?

- Compare current benevolent funds to present value of expected subsidies for current population

- Need updated income and asset information on current residents
Planning for Charitable Needs Summary

◆ Financial screening process should be objective and consistent
◆ Current charitable obligations should be quantified
◆ Financial aid calculations must consider variables such as age, gender and contract type
◆ Don’t forget personal allowance expenses!
Contract Design

◆ Situation
  ■ Prospects with long-term care insurance not interested in lifecare contract

◆ Process
  ■ Develop several funding options for limited healthcare benefits

◆ Results
  ■ Facility implemented new contract options
Contract Design

Marketplace Realities:

◆ Residents want options and pricing flexibility

◆ CCRCs face increased competition in providing for housing and health care needs of older adults
Contract Design

Three considerations for selecting options and setting fees:

- Costs
- Marketplace
- Board and management philosophy
Objectives of Actuarial Analysis

◆ To test adequacy of combination of monthly fees and entry fees
◆ To evaluate relative equity of fees by unit type and for alternative contract options
◆ To determine whether cash balances remain positive and ratio targets are met
Actuarial Fee Adequacy

◆ New entrant pricing:

Compare future costs (actuarial liabilities) with combination of entry fee plus monthly fees (actuarial assets)

◆ Assets must be equal to or greater than liabilities or subsidy will be required
  ■ Future generations of residents
  ■ Future “correction” fee increases

◆ Include a margin to cover experience deviations and contribution to surplus
Are the Fees Adequate and Equitable among Contract Types?

Plan A: 14%
Plan B: 18%
Are the Fees Adequate and Equitable among Unit Types?

- Studio: -6% -17%
- One Bed: 17% 2%
- Two Bed: 32% 22%
- Cottage: 33% 16%

Legend: Single - Red, Couple - Green
Entry fees are simply a prepayment of future monthly fees

Entry fees plus monthly fees must cover operating, capital, and refund costs
Contract Options

- Refundable entrance fees
- Flexible entrance fee/monthly fee combinations
- Unbundled services
- Prepaid health care
- Risk-based pricing
Refundable Entrance Fees

◆ Refunds are a future cost that must be prefunded - even if refunds are only paid upon unit reoccupancy

◆ Actuarial funding of refunds: Portion of entrance fee will accumulate with interest to equal expected refund payout
50% Refundable Entrance Fee

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<tr>
<td>Yr 12</td>
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Flexible Entrance Fee/Monthly Fee Combinations

◆ Residents want a fee structure to match their net worth and income streams

◆ CCRC wants to collect equivalent amounts over resident’s lifetime and cover expected costs of care
Entrance Fee/Monthly Fee Exchange

- Pay larger entrance fee to reduce monthly fee
- OR
- Pay larger monthly fee to reduce entrance fee
Unbundled Services

Include services in monthly fees or provide on fee-for-service basis?

- Lower monthly fees if unbundled, but “nickel & dime” billing
- Need to track usage for billing
- More difficult to plan if usage can vary significantly
Prepaid Health Care

- Discounted assisted living or nursing care
- Limits on number of discounted days
- Deductible period before eligible for discounted days
- Residents becoming more familiar with LTC insurance
Risk-Based Pricing

Fee variations based on:

◆ Age (younger live longer)
◆ Gender (females live longer and use more health care than males)
◆ Marital Status (couples live longer and use less health care than singles)
◆ Health Status (assessment of individual needs)
Contract Design Summary

- Pricing of contract options can vary significantly by age or health status.
- Beware of adverse selection risk if multiple options are offered.
- Need systems to track utilization and cost of services to properly manage and adequately price contract options.
Mergers and acquisitions (appraisals)

◆ Situation
  ■ A multi-facility organization has opportunity to purchase CCRCs in one of their markets

◆ Process
  ■ Need to evaluate offering projections and develop their purchase criteria

◆ Results
  ■ Made offer based on IRR requirements
What Financial Criteria are Important in Decision?

- Appraisals
  - Comparable facilities
  - Alternative use
  - Net present value of cash flows or IRR
  - Actuarial
Management Issue A

- How do we evaluate (justify) use of 50% of credit-line for improving CCRC

- Description of alternatives
  - $9.0 million expansion
  - $3.5 million expansion
  - $3.5 million expansion with pent-up demand
  - $10.0 million expansion
  - $10.0 million expansion with sheltered beds
Baseline Net Cash Flows versus Scenario I = 14.1%
Comparison of IRR Results
Management Issue B

How do we determine purchase price for acquiring an existing CCRC?

Description of alternatives

- Commission traditional appraisal
- Minimum cash payback period
- Goals for investment returns
IRR Calculations for Various Timeframes

Facility A

Facility B
Management Issue C

◆ The actuarial valuation as of December 31, 1999 shows an unfunded liability, but the new entrant pricing test shows an actuarial surplus

◆ Is there a method to reflect the surplus in new entrants’ fees with the current closed-group actuarial valuation?
Open- and Closed-group Actuarial Valuations

-40.0%  -20.0%  0.0%  20.0%  40.0%  60.0%  80.0%

1-Funded Status  Reserves / Liabilities  Return on Fixed Assets  New Entrant Pricing

Closed-group  Open-group
When is an Open-Group Valuation Appropriate?

◆ Concept is based on adjusting fixed assets values based on surplus in new entrants’ fee—assumes that these fees are accepted in the marketplace

◆ In this extreme example, fixed assets are worth nearly 3 times book value

◆ Use cautiously when significant intergenerational transfer exists
Predictions for the Future

◆ The best way to predict the future is to create it

■ CCRCs with multiple contract options will dominate marketplace, such as Types A, B, and C on same campus along with equity or condo models—this means that pricing and potential adverse selection issues will have to be resolved
Predictions for the Future

◆ The best way to predict the future is to create it

■ An information system will arise that will provide meaningful financial, operational, clinical, and marketing information

■ Limited-use tools such as operational reviews, market audits, and capital need assessments will become routine procedures

■ Regulation will remain a state-level initiative