The Use of Acute Health Care Services by Mentally-Ill Seniors of Newfoundland and Labrador: A Quantitative Investigation

Lisa Adams
RN, BN, BSc., MSc., PhD., CCHL, CPMHN ©, CCHL Fellow
CHSRF Fellow

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Introduction

- Impetus for this study:
  - Aging population
  - Health care costs
  - Methodological gaps & concerns

- Realistically:
  - Stigma (Double whammy)
  - Services (lack thereof)
  - Uninformed clinicians

“I would do anything to have breast cancer over mental illness. I would do anything because I [would] not have to put up with the stigma.”

— Helen Forristall from “Out of the shadows at last”
Purpose & Questions

- How do seniors with and without mental illness diagnostic codes in the province of NL compare in their use of acute in-patient hospital services?

- What is the influence of key demographic characteristics, diagnoses, admission variables, involved institutions and discharge disposition on the use of acute in-patient hospital services by seniors with and without mental illness diagnostic codes?
Method

- Ethical approval: HERO & HIC
- Research Design
- Sample- 65+, all acute care hospitals/facilities
- Data- Discharge Abstract Database (NLCHI), ICD-10 codes, 2008-2009
- Dependent variables: LOS, ALOS, RIW, costs, ROA, ER wait time.
- Independent variables: age, gender, geography, referring facility, discharge destination, discharge disposition, co-morbidities, mental illnesses, re/admission variables.
- Statistical Tests- Univariate, bivariate, multivariate, parametric/non-parametric
Model of Health Service Use

Predisposing Variables
- Age
- Gender

Enabling Variables
- Geography
- Co-morbidities
- Referring institution
- Discharge destination
- Discharge disposition
- Re/Admission variables

Need Variables
- Mental Illness

Use of Health Services
- Total length of stay
- Acute length of stay
- Rate of admission
- Resource Intensity Weight
- Hospital Costs
- ER wait time
Results

- 12,502 seniors,
- 19,093 admissions,
- 74,885 diagnoses
- % of seniors with mental illness codes: 10% (1,235 MIs)
- 65-101 yrs (Avg = 76.85)
Results (cont’d)

Impact of variables for seniors with mental illness codes:

→ Female seniors use more resources, males are more expensive
→ Urban seniors use more resources & cost more than rural seniors
→ Avg age was higher
→ Admitted from emergency on urgent basis
→ Unplanned readmissions
→ Primarily d/c home or to long term care facilities
→ Primarily admitted from own homes
→ Psychiatric co-morbidities = greater usage
Population comparison

Comparative Proportions of Mental Illness in Seniors

% of Seniors

11,267 (90%)

1,235 (10%)
## Demographic Information

<table>
<thead>
<tr>
<th>Variable</th>
<th>Seniors with MI codes</th>
<th>Seniors w/o MI codes</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>78.21 yrs</td>
<td>76.67 yrs</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Gender (% female)</td>
<td>52.6%</td>
<td>51.1%</td>
<td>p = 0.32</td>
</tr>
<tr>
<td>Geography (% rural)</td>
<td>8.9% (vs. 12.7% urban)</td>
<td>91.1% (vs. 87.3% urban)</td>
<td>p &lt; 0.001</td>
</tr>
</tbody>
</table>
Age Distribution

Age Distribution of Seniors with and without Mental Illnesses

Legend
- Non mental illness
- Mental Illness

Mean MI = 78.21
Mean No MI = 76.67
# Age Correlations

<table>
<thead>
<tr>
<th>DEPENDENT VARIABLE</th>
<th>AGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOS</td>
<td>.116</td>
</tr>
<tr>
<td>ALOS</td>
<td>.046</td>
</tr>
<tr>
<td>ROA</td>
<td>.017</td>
</tr>
<tr>
<td>RIW</td>
<td>.039</td>
</tr>
<tr>
<td>COST</td>
<td>.029</td>
</tr>
<tr>
<td>ER WAIT TIME</td>
<td>.004</td>
</tr>
<tr>
<td># DIAGNOSES</td>
<td>.048</td>
</tr>
</tbody>
</table>
Gender Differences

Distribution of Gender in Hospitalized Seniors with and without Mental Illness

- MI Group:
  - Non mental illness
  - Mental Illness

Gender

Male
Female

Percent

60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
## Specifics of Gender Differences

<table>
<thead>
<tr>
<th>Variable (means)</th>
<th>Males with MIs</th>
<th>Females with MIs</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>585</td>
<td>650</td>
<td>p = 0.32 (NS)</td>
</tr>
<tr>
<td>LOS</td>
<td>28.21</td>
<td>30.97</td>
<td>p = 0.160 (NS)</td>
</tr>
<tr>
<td>ALOS</td>
<td>17.45</td>
<td>18.54</td>
<td>p = 0.235 (NS)</td>
</tr>
<tr>
<td>ROA</td>
<td>1.79</td>
<td>1.69</td>
<td>p = 0.796 (NS)</td>
</tr>
<tr>
<td>ER wait time</td>
<td>6.33</td>
<td>5.61</td>
<td>p = 0.186 (NS)</td>
</tr>
<tr>
<td>RIW</td>
<td>5.10</td>
<td>4.26</td>
<td>p = 0.011 (S)</td>
</tr>
<tr>
<td>Cost</td>
<td>$21,876</td>
<td>$18,023</td>
<td>p = 0.003 (S)</td>
</tr>
</tbody>
</table>
Residential Geography

Proportion of Seniors with & without mental illness across Geography

<table>
<thead>
<tr>
<th>Proportion</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No MI</td>
<td>100</td>
<td>60</td>
</tr>
</tbody>
</table>

Geography

Legend:
- MI
- No MI
### Specifics of Residential Geography

<table>
<thead>
<tr>
<th>Variable (Means)</th>
<th>Urban with MIs</th>
<th>Rural with MIs</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>45% (n=558)</td>
<td>55% (n=677)</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>LOS</td>
<td>32.0</td>
<td>27.0</td>
<td>P &lt; 0.001 (S)</td>
</tr>
<tr>
<td>ALOS</td>
<td>18.77</td>
<td>17.41</td>
<td>p= 0.042 (S)</td>
</tr>
<tr>
<td>ROA</td>
<td>1.67</td>
<td>1.80</td>
<td>p= 0.907 (NS)</td>
</tr>
<tr>
<td>ER wait time</td>
<td>4.89</td>
<td>6.03</td>
<td>p= 0.330 (NS)</td>
</tr>
<tr>
<td>RIW</td>
<td>5.6</td>
<td>3.9</td>
<td>p= 0.001 (S)</td>
</tr>
<tr>
<td>Cost</td>
<td>24,765</td>
<td>15,796</td>
<td>p &lt; 0.001 (S)</td>
</tr>
</tbody>
</table>
Facility Geography

Location of Acute Hospital/Facility for Seniors with and without Mental Illnesses

Legend
- Non mental illness
- Mental Illness

Percentage of Seniors

Location of Acute Hospital/Facility

Urban
Rural
Variation among categories

Distribution of Mental Illness Codes in Seniors

<table>
<thead>
<tr>
<th>Mental Illness Category</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood</td>
<td>307 (18.7%)</td>
</tr>
<tr>
<td>Organic</td>
<td>970 (59%)</td>
</tr>
<tr>
<td>Substance Use</td>
<td>166 (10%)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>126 (8%)</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>46 (3%)</td>
</tr>
<tr>
<td>Personality</td>
<td>9 (0.5%)</td>
</tr>
<tr>
<td>MR</td>
<td>8 (0.4%)</td>
</tr>
</tbody>
</table>
Mental Illness Specifics

Prevalence of Specific Mental Illnesses in Seniors

Proportion

Depression: 74%
Dementia: 58%
Delirium: 38.5%
Alcoholism: 79%

Diagnoses
## Service Use Results (Crude)

<table>
<thead>
<tr>
<th>Service Utilization</th>
<th>Seniors with Mental Illness Diagnostic Codes</th>
<th>Seniors without Mental Illness Diagnostic Codes</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total LOS</td>
<td>42.68 (SD = 46.69) Median = 14</td>
<td>15.57 (SD = 23.88) Median = 6</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Acute LOS</td>
<td>26.96 (SD = 29.28) Median = 10</td>
<td>12.92 (SD = 17.30) Median = 6</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Rate of admission</td>
<td>1.74 (SD = 1.14) Median = 1</td>
<td>1.50 (SD = 1.03) Median = 1</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>ER wait time</td>
<td>5.95 (SD = 12.16) Median = 2</td>
<td>3.81 (SD = 8.98) Median = 2</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>RIW</td>
<td>4.69 (SD = 8.93) Median = 2.08</td>
<td>2.04 (SD = 3.54) Median = 1.05</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Costs</td>
<td>$19,849 (SD = 45,332) Median = $7,454</td>
<td>$8,718 (SD = 16,505) Median = $4,650</td>
<td>p &lt; 0.001</td>
</tr>
</tbody>
</table>
### Adjustments overall

<table>
<thead>
<tr>
<th>Service Utilization</th>
<th>Seniors with MI codes</th>
<th>Seniors w/o MI codes</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total LOS (days)</td>
<td>24.5</td>
<td>11.1</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Acute LOS (days)</td>
<td>8.8</td>
<td>16.4</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Mean number of admissions</td>
<td>1.8</td>
<td>1.5</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>ER wait time (hrs)</td>
<td>5.5</td>
<td>4.8</td>
<td>p = 0.048</td>
</tr>
<tr>
<td>RIW</td>
<td>4.0</td>
<td>2.1</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Costs ($)</td>
<td>16,731</td>
<td>9,059</td>
<td>p &lt; 0.001</td>
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</tbody>
</table>
## Adjustments for Cost

### Tests of Between-Subjects Effects

Dependent Variable: Mean Cost Admission Mean Cost/Admission (Cdn $)

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>5.455E11</td>
<td>19</td>
<td>2.871E10</td>
<td>68.951</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.207E10</td>
<td>1</td>
<td>3.207E10</td>
<td>77.028</td>
<td>.000</td>
</tr>
<tr>
<td>Gender_first</td>
<td>1.703E9</td>
<td>1</td>
<td>1.703E9</td>
<td>4.090</td>
<td>.043</td>
</tr>
<tr>
<td>Age_first</td>
<td>8.864E9</td>
<td>1</td>
<td>8.864E9</td>
<td>21.287</td>
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<tr>
<td>entry_clinic</td>
<td>5.660E8</td>
<td>1</td>
<td>5.660E8</td>
<td>1.359</td>
<td>.244</td>
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<tr>
<td>entry_dept</td>
<td>4.550E8</td>
<td>1</td>
<td>4.550E8</td>
<td>1.093</td>
<td>.296</td>
</tr>
<tr>
<td>Entry_code_ER</td>
<td>3.236E8</td>
<td>1</td>
<td>3.236E8</td>
<td>.777</td>
<td>.378</td>
</tr>
<tr>
<td>Readmit_planned</td>
<td>3.668E8</td>
<td>1</td>
<td>3.668E8</td>
<td>.881</td>
<td>.348</td>
</tr>
<tr>
<td>Acute_seven</td>
<td>1.164E9</td>
<td>1</td>
<td>1.164E9</td>
<td>2.796</td>
<td>.095</td>
</tr>
<tr>
<td>Acute_8_28</td>
<td>3.260E8</td>
<td>1</td>
<td>3.260E8</td>
<td>.783</td>
<td>.376</td>
</tr>
<tr>
<td>Acute_daysurgery</td>
<td>5.526E8</td>
<td>1</td>
<td>5.526E8</td>
<td>1.327</td>
<td>.249</td>
</tr>
<tr>
<td>DD_LTC</td>
<td>4.196E10</td>
<td>1</td>
<td>4.196E10</td>
<td>100.781</td>
<td>.000</td>
</tr>
<tr>
<td>DD_Other</td>
<td>6.090E9</td>
<td>1</td>
<td>6.090E9</td>
<td>14.625</td>
<td>.000</td>
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<tr>
<td>DD_Home_Support</td>
<td>1.079E8</td>
<td>1</td>
<td>1.079E8</td>
<td>.259</td>
<td>.611</td>
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<tr>
<td>DD_Home</td>
<td>4.432E9</td>
<td>1</td>
<td>4.432E9</td>
<td>10.643</td>
<td>.001</td>
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<tr>
<td>DD_AMA</td>
<td>1.194E9</td>
<td>1</td>
<td>1.194E9</td>
<td>2.869</td>
<td>.090</td>
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<tr>
<td>DD_Died</td>
<td>3.970E10</td>
<td>1</td>
<td>3.970E10</td>
<td>95.334</td>
<td>.000</td>
</tr>
<tr>
<td>Rural_urban_residence_first</td>
<td>1.314E9</td>
<td>1</td>
<td>1.314E9</td>
<td>3.155</td>
<td>.076</td>
</tr>
<tr>
<td>Rural_urban_facility_first</td>
<td>1.329E10</td>
<td>1</td>
<td>1.329E10</td>
<td>31.916</td>
<td>.000</td>
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<tr>
<td>CCI</td>
<td>7.556E8</td>
<td>1</td>
<td>7.556E8</td>
<td>1.815</td>
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<tr>
<td>MIGroup_max</td>
<td>6.147E10</td>
<td>1</td>
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<td>147.622</td>
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</tr>
<tr>
<td>Error</td>
<td>5.197E12</td>
<td>12482</td>
<td>4.164E8</td>
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</tr>
<tr>
<td>Total</td>
<td>6.948E12</td>
<td>12502</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>5.743E12</td>
<td>12501</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .095 (Adjusted R Squared = .094)
## Correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>LOS</th>
<th>ALOS</th>
<th>RIW</th>
<th>Cost</th>
<th>ER wait time</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOS</td>
<td>1</td>
<td>.766</td>
<td>.763</td>
<td>.720</td>
<td>.023</td>
</tr>
<tr>
<td>ALOS</td>
<td>1</td>
<td></td>
<td>.685</td>
<td>.590</td>
<td>.033</td>
</tr>
<tr>
<td>RIW</td>
<td>1</td>
<td>1</td>
<td></td>
<td>.880</td>
<td>-.001</td>
</tr>
<tr>
<td>Cost</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>-.003</td>
</tr>
<tr>
<td>ER wait time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
Total LOS across categories

Length of Hospital Stay

<table>
<thead>
<tr>
<th>Mental Illness</th>
<th>LOS %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>23%</td>
</tr>
<tr>
<td>Substance…</td>
<td>15%</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>12%</td>
</tr>
<tr>
<td>Mood</td>
<td>28%</td>
</tr>
<tr>
<td>Anxiety</td>
<td>11%</td>
</tr>
<tr>
<td>Personality</td>
<td>6%</td>
</tr>
<tr>
<td>MR</td>
<td>1.5%</td>
</tr>
</tbody>
</table>
Acute LOS across categories

Acute Length of Stay for Seniors with Mental Illnesses

Mental Illness

Organic: 18%
Substance Use: 13%
Schizophrenia: 14%
Mood: 33%
Stress/Anxiety: 14%
Personality: 3%
MR: 2%
Rate of Admissions

Rate of admissions

<table>
<thead>
<tr>
<th>Presence of Mental Illness</th>
<th>Rate of Admissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI</td>
<td>1.74</td>
</tr>
<tr>
<td>No MI</td>
<td>1.5</td>
</tr>
</tbody>
</table>

25
# of Re/admissions for Seniors

<table>
<thead>
<tr>
<th>Episodes of Re/admissions</th>
<th>MI</th>
<th>No MI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>57.8%</td>
<td>69.8%</td>
</tr>
<tr>
<td>2</td>
<td>24.1%</td>
<td>19%</td>
</tr>
<tr>
<td>3</td>
<td>10%</td>
<td>6.6%</td>
</tr>
<tr>
<td>4</td>
<td>4.7%</td>
<td>2.6%</td>
</tr>
<tr>
<td>5</td>
<td>1.8%</td>
<td>1%</td>
</tr>
</tbody>
</table>
Resource Intensity Weight across categories

Mental Illnesses and their accompanying Cumulative Resource Intensity Weight

Mental Illness

- Mood
- Organic
- Substance Use
- Anxity
- Personality
- MR
ER Wait Time across categories

Proportion of ER Wait Time

Mental Illness

Organic: 19%
Mood: 17%
MR: 14%
Anxiety: 13%
Schizophrenia: 11%
Personality: 10%
Substance Use: 10%
Hospital Costs across categories

Cumulative Costs by Mental Illness Codes Diagnostic Categories

Costs in dollars

- Organic
- Mood
- Substance
- Schizophrenia
- Anxiety
- Personality
- MR

Diagnostic Category

0 100000 200000 300000 400000 500000
Mode of Entry

Entry Code Comparisons for Seniors with & without Mental Illnesses

- Admitted via clinic of reporting facility
- Direct via admitting department or directly to unit
- Admitted via ER
- Admitted via day surgery

MI Group:
- Non mental illness
- Mental Illness

Percent of Seniors

Entry Codes to Hospital
Admission Codes

Comparison of Admission Code for Seniors with and without Mental Illnesses

<table>
<thead>
<tr>
<th>Admission Code</th>
<th>Percentage in Seniors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgent</td>
<td>80%</td>
</tr>
<tr>
<td>Elective</td>
<td>20%</td>
</tr>
</tbody>
</table>

Mental Illness Grouping:
- Non mental illness
- Mental Illness
MI categories x Entry Code (% ER)
Admission code (% Urgent)

<table>
<thead>
<tr>
<th>Mental Illness Category</th>
<th>% Urgent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>93</td>
</tr>
<tr>
<td>Mood</td>
<td>91</td>
</tr>
<tr>
<td>Substance</td>
<td>95</td>
</tr>
<tr>
<td>Anxiety</td>
<td>94</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>98</td>
</tr>
<tr>
<td>Personality</td>
<td>100</td>
</tr>
<tr>
<td>MR</td>
<td>100</td>
</tr>
</tbody>
</table>
Readmission Codes

Comparison of Readmission Codes for Seniors with and without Mental Illnesses

Legend:
- Non mental illness
- Mental Illness

Percentage of Seniors

Readmission Code

- Planned readmission from previous acute care adm
- Readmitted unplanned in <= 7 days since discharge
- Readmitted unplanned in 8-26 days since discharge
- New patient to the acute care unit
- None of above i.e. unplanned readmission > 28 days since discharge

Legend:
- Non mental illness
- Mental Illness
Mental Illness pts only & ROAs

<table>
<thead>
<tr>
<th>Admissions</th>
<th>1 adm</th>
<th>2 adm</th>
<th>3 adm</th>
<th>4 adm</th>
<th>5 adm</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI</td>
<td>87</td>
<td>10</td>
<td>2</td>
<td>0.7</td>
<td>0.2</td>
</tr>
</tbody>
</table>

35
MI categories x Unplanned readmission > 28 days

<table>
<thead>
<tr>
<th>Mental Illness Category</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>72</td>
</tr>
<tr>
<td>Mood</td>
<td>76</td>
</tr>
<tr>
<td>Substance</td>
<td>69</td>
</tr>
<tr>
<td>Anxiety</td>
<td>73</td>
</tr>
<tr>
<td>Personality</td>
<td>82</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>67</td>
</tr>
<tr>
<td>Mental Retardation</td>
<td>88</td>
</tr>
</tbody>
</table>
Discharge Destination

- NSG home: 3.1 (MI), 16 (No MI)
- PCH: 2.7 (MI), 8.3 (No MI)
- Other A/C: 5.2 (MI), 3.1 (No MI)
- Chronic: 3.6 (MI), 0.6 (No MI)
- Rehab: 1.5 (MI), 1.3 (No MI)
- Com Care: 0.2 (MI), 0 (No MI)
Discharge Disposition

Comparison of Discharge Disposition for Seniors with and without Mental Illnesses

Legend
- Non mental illness
- Mental Illness

Discharge Disposition

- Transferred to acute care inpatient facility
- Transferred to continuing care facility
- Transferred to a different service
- Discharged to home with support services
- Discharged home
- Left against medical advice
- Died
- Patient did not return from pass
## Specifics of Discharge Disposition

<table>
<thead>
<tr>
<th>Category of Mental Illness</th>
<th>Most common disposition</th>
<th>% value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organic</strong></td>
<td>LTC/CC</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>D/C home</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>Died</td>
<td>11.1%</td>
</tr>
<tr>
<td><strong>Mood</strong></td>
<td>D/C home</td>
<td>56%</td>
</tr>
<tr>
<td></td>
<td>LTC/CC</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>Home with supports</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Substance Use</strong></td>
<td>D/C home</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>Home with supports</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>LTC/CC</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Schizophrenia</strong></td>
<td>D/C home</td>
<td>48%</td>
</tr>
<tr>
<td></td>
<td>LTC/CC</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Died</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Anxiety</strong></td>
<td>D/C home</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td>LTC/CC</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>Home with supports</td>
<td>12%</td>
</tr>
<tr>
<td><strong>Personality</strong></td>
<td>D/C home</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>Left against med advice</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>D/C home with supports</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Transferred to another A/C site</td>
<td>11%</td>
</tr>
<tr>
<td><strong>MR</strong></td>
<td>D/C home</td>
<td>37.5%</td>
</tr>
<tr>
<td></td>
<td>LTC/CC</td>
<td>37.5%</td>
</tr>
<tr>
<td></td>
<td>Home with supports</td>
<td>25%</td>
</tr>
</tbody>
</table>
Referring Institution

<table>
<thead>
<tr>
<th>Location</th>
<th>MI</th>
<th>No MI</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCHs</td>
<td>7.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Nsg home</td>
<td>5.1</td>
<td>2</td>
</tr>
<tr>
<td>ER rooms</td>
<td>4</td>
<td>3.2</td>
</tr>
<tr>
<td>Com care</td>
<td>0.2</td>
<td>0</td>
</tr>
<tr>
<td>Day surgery</td>
<td>0.3</td>
<td>0.6</td>
</tr>
</tbody>
</table>
Medical Co-morbidities

Distribution of Co-Morbid Illnesses for Seniors with and without Mental Illnesses

Legend
- Non mental illness
- Mental Illness

Percentage of Seniors

Co-Morbid Illnesses

- Arthritis
- Diabetes
- Heart Disease
- Chronic Obstructive Pulmonary Disease
- Pneumonia
- COPD
- Chronic Kidney Disease
- Diabetes Complications
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- Diab
### What’s seen most frequently on repeat re/admissions

<table>
<thead>
<tr>
<th>With 2 admissions:</th>
<th>With 4 admissions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>Organic</td>
</tr>
<tr>
<td>50%</td>
<td>32%</td>
</tr>
<tr>
<td>Mood</td>
<td>Mood</td>
</tr>
<tr>
<td>24%</td>
<td>27%</td>
</tr>
<tr>
<td>Substance</td>
<td>Substance</td>
</tr>
<tr>
<td>13%</td>
<td>20%</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Anxiety</td>
</tr>
<tr>
<td>5%</td>
<td>16%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>With 3 admissions:</th>
<th>With 5 admissions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>Mood</td>
</tr>
<tr>
<td>49%</td>
<td>50%</td>
</tr>
<tr>
<td>Mood</td>
<td>Personality</td>
</tr>
<tr>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Substance</td>
<td>Substance</td>
</tr>
<tr>
<td>10%</td>
<td>12.5%</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Delirium (org.)</td>
</tr>
<tr>
<td>8%</td>
<td>12.5%</td>
</tr>
</tbody>
</table>
Placement (%) of mental illness codes

- Primary: 9%
- Secondary: 9%
- Third: 6%
- Fourth: 5%
- Fifth: 3%
- Sixth: 1%
1,235 seniors with mental illness diagnostic codes in total

→ 86% had only 1 mental illness code  
   → 91% had 1 admission
→ 12% had two mental illness codes  
   → 84% had 1 admission  
   → 10% had 2 admissions
→ 2% had three mental illness codes  
   → 88% had 1 admission
Extra age analysis for cost

Age categories x overall costs

Mean

0 5000 10000 15000 20000 25000 30000 35000

65-69 70-74 75-79 80-84 85-89 90-94 95-99 100-105

Age category
Extra age analysis x ROA

Age categories x #admissions

<table>
<thead>
<tr>
<th>Age category</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-69</td>
<td>2.5</td>
</tr>
<tr>
<td>70-74</td>
<td>2.0</td>
</tr>
<tr>
<td>75-79</td>
<td>1.8</td>
</tr>
<tr>
<td>80-84</td>
<td>1.6</td>
</tr>
<tr>
<td>85-89</td>
<td>1.4</td>
</tr>
<tr>
<td>90-94</td>
<td>1.2</td>
</tr>
<tr>
<td>95-99</td>
<td>1.0</td>
</tr>
<tr>
<td>100-105</td>
<td>0.8</td>
</tr>
</tbody>
</table>

ROA
Other Findings of Interest

- Suicide
- Admission service
- Attending clinician
Limitations of Study

- Database
- Sample
- Missed internal information
Health Care Service Delivery Implications

- Assessment, diagnosis & tx of seniors with mental illness in acute care hospitals, ER’s in particular
- Long term care admission procedures/policies
- Community supports e.g. home care
- Roles of health care professionals as advocates, supports, counselors, educators, etc.
- Education of frontline clinicians on the topic of seniors with mental illnesses
- Discharge processes review and consistency.
Future Research

- Looking ahead:
  - CHSRF & Health Canada Research Fellowship- *Educating for a Senior Friendly Hospital and Efficient ER*
  - To compare these variables across other age cohorts.
  - To make interprovincial comparisons.
  - To investigate the various mental illness codes in-depth.
Thank you

Questions?

This research was funded in part by a Research Trust Award from the ARNNL & the Alberta Center on Aging

“Find hope in the darkest of days, and focus in the brightest. Do not judge the universe.”  Dalai Lama