

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



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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”

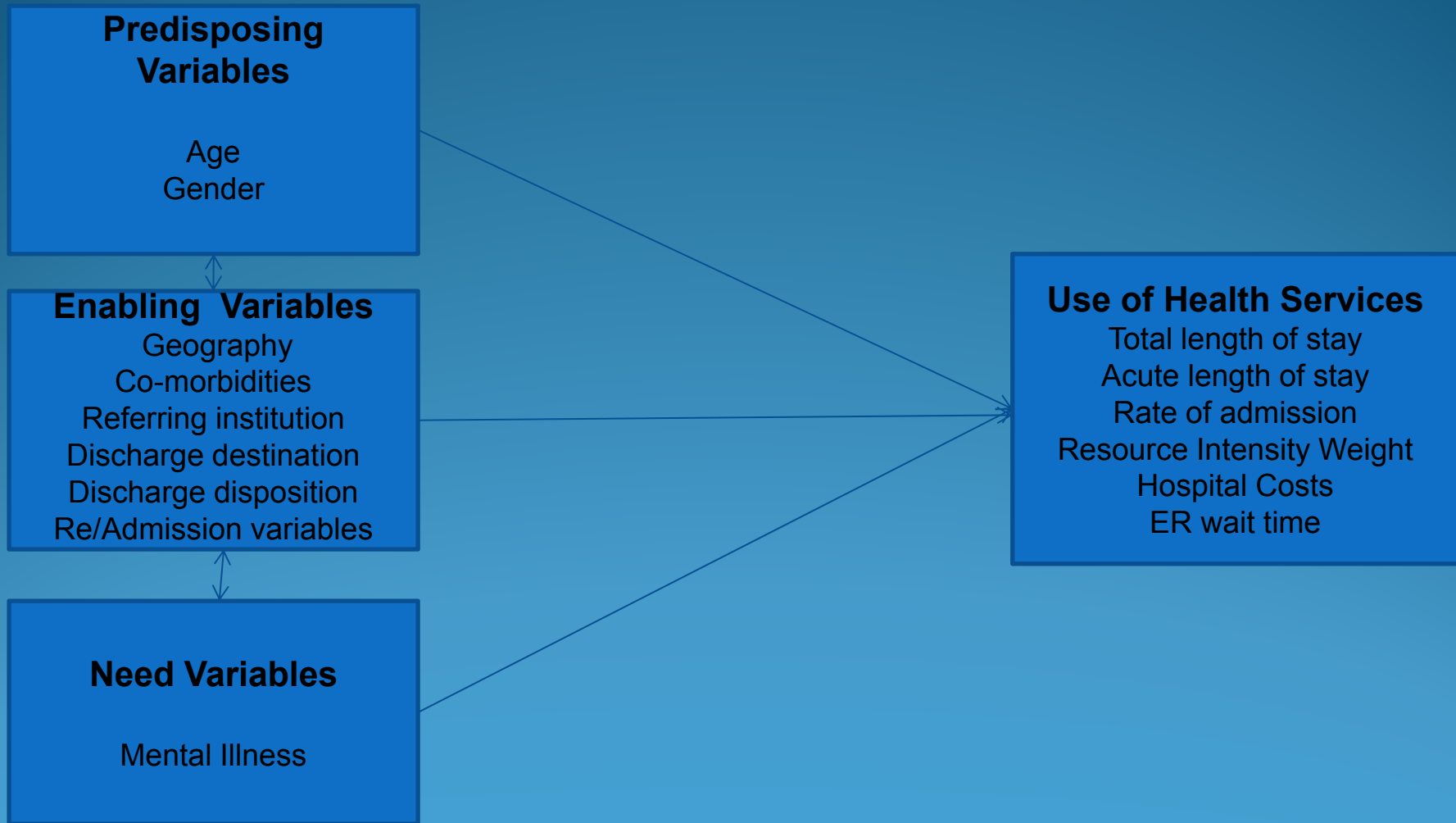
Purpose & Questions

- 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



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)

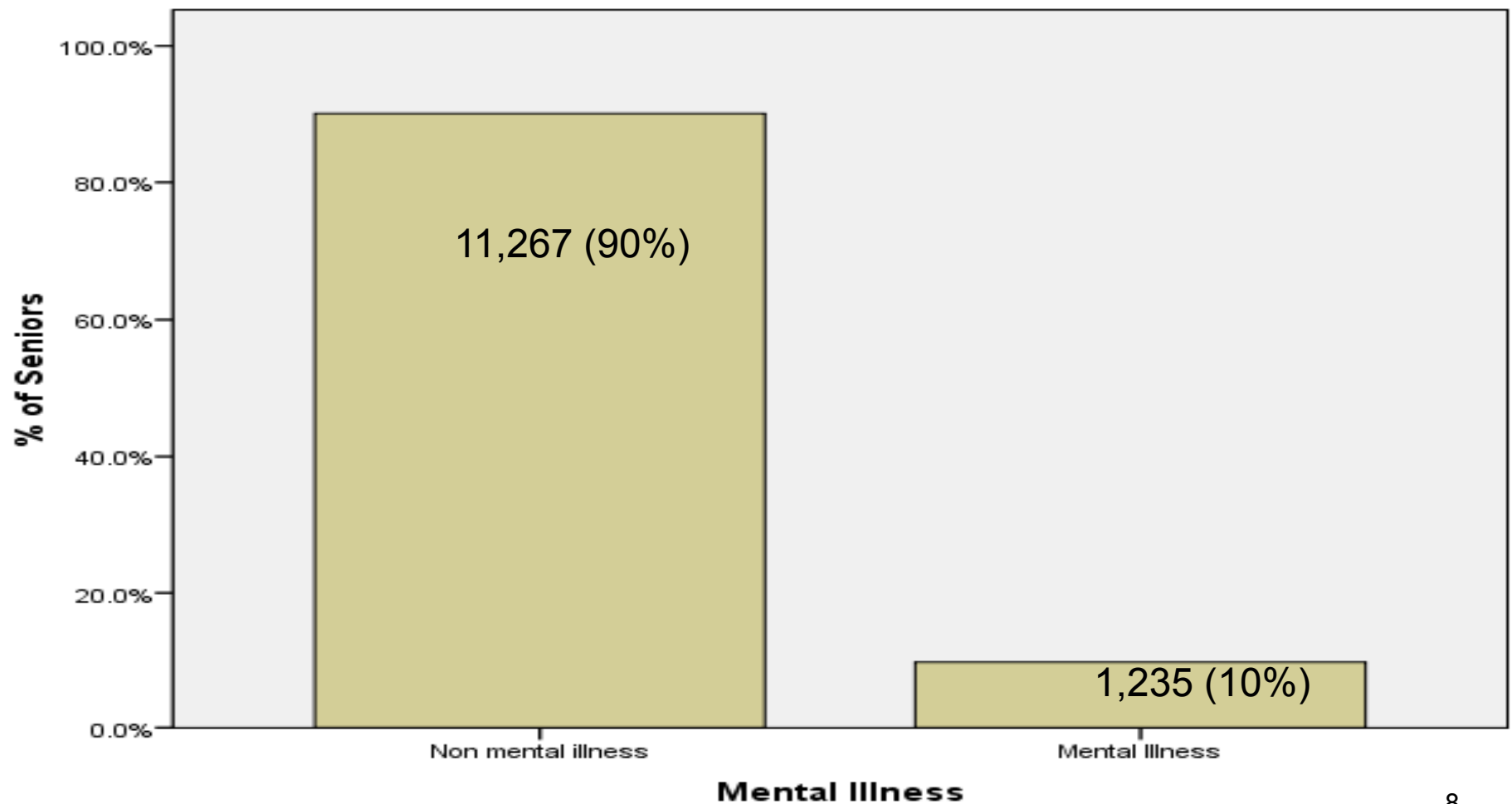
Results (cont'd)

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

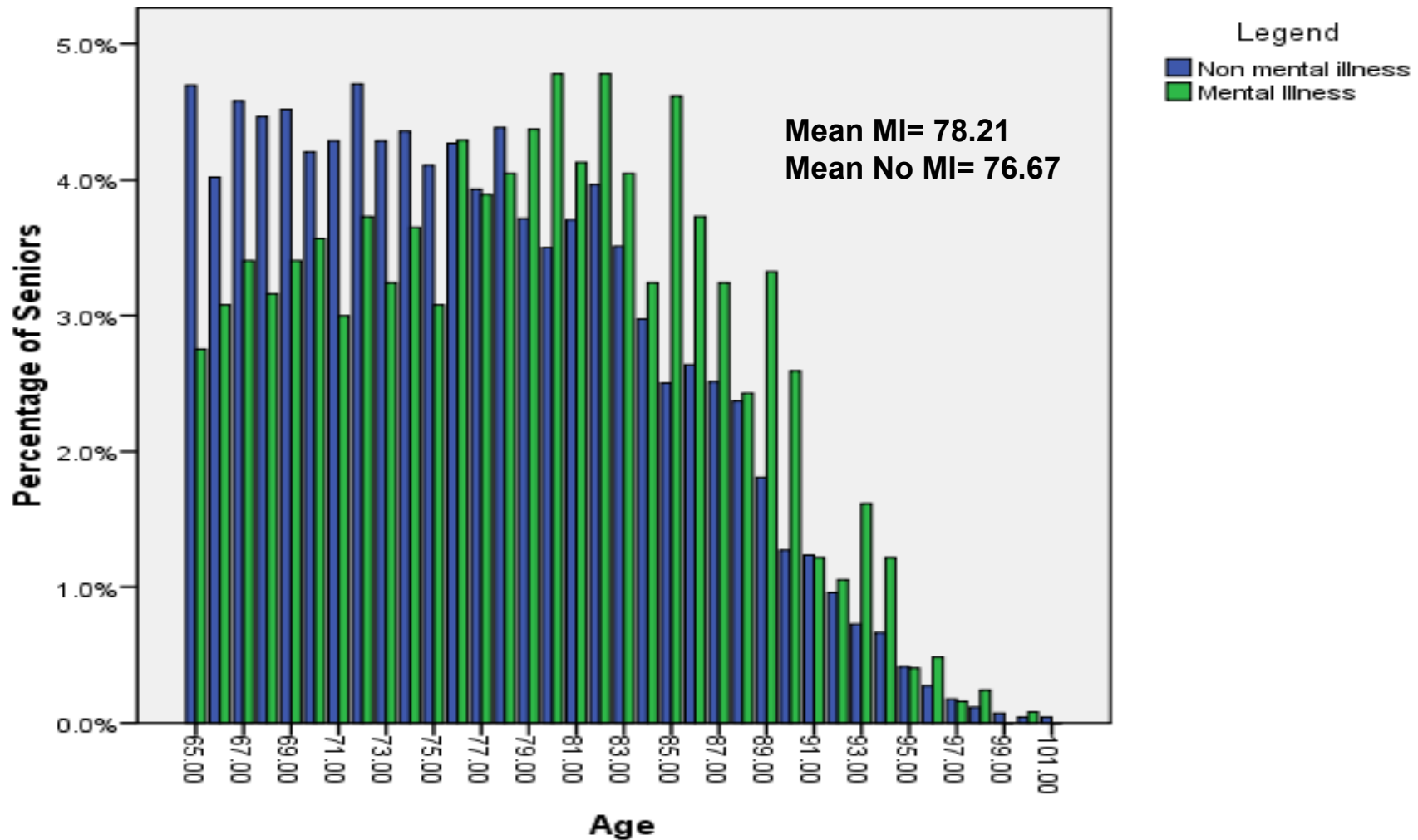


Demographic Information

Variable	Seniors with MI codes	Seniors w/o MI codes	P-value
Age (years)	78.21 yrs	76.67 yrs	p < 0.001
Gender (% female)	52.6%	51.1%	p = 0.32
Geography (% rural)	8.9% (vs. 12.7% urban)	91.1% (vs. 87.3% urban)	p < 0.001

Age Distribution

Age Distribution of Seniors with and without Mental Illnesses

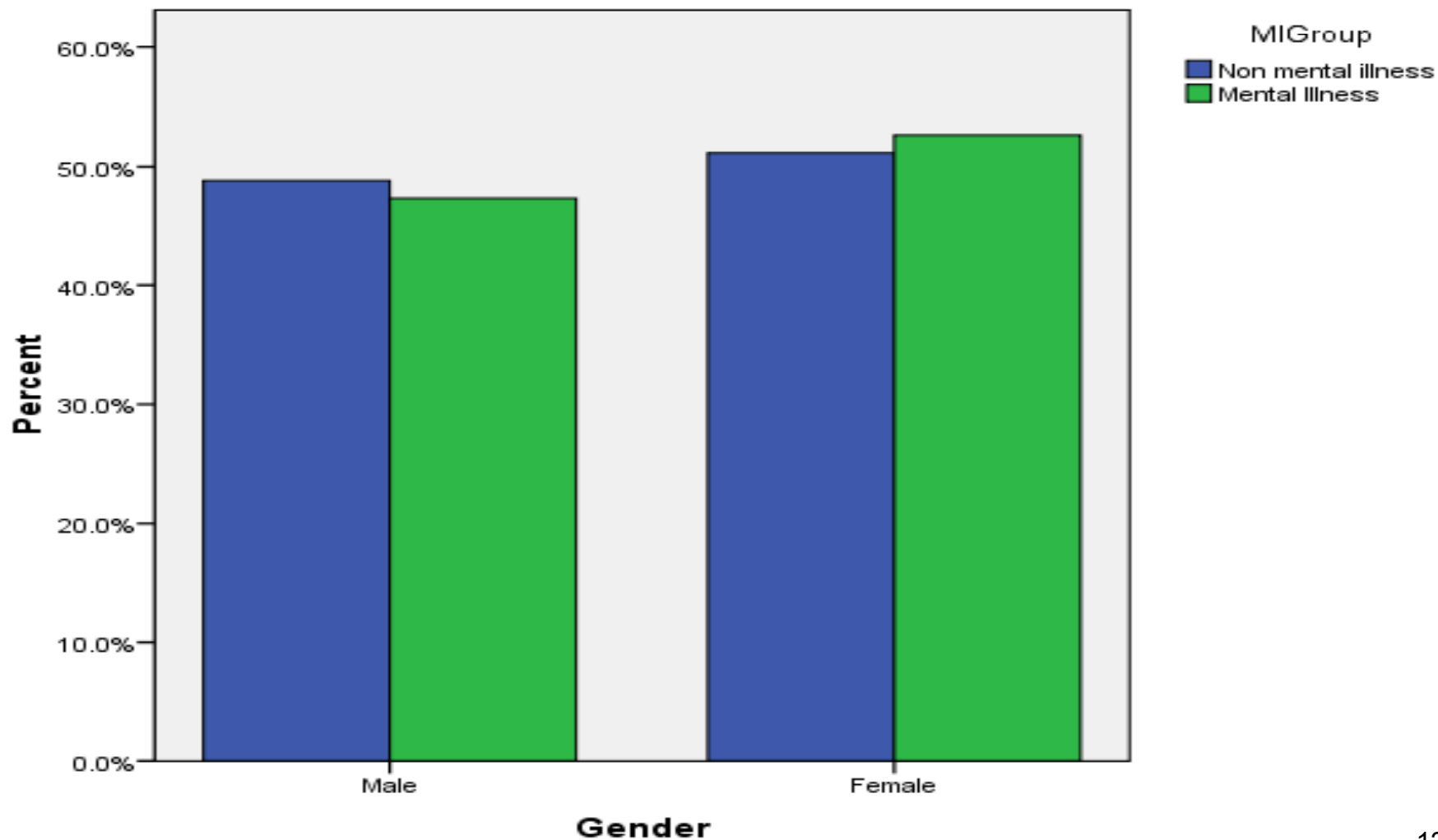


Age Correlations

DEPENDENT VARIABLE	AGE
LOS	.116
ALOS	.046
ROA	.017
RIW	.039
COST	.029
ER WAIT TIME	.004
# DIAGNOSES	.048

Gender Differences

Distribution of Gender in Hospitalized Seniors with and without Mental Illness

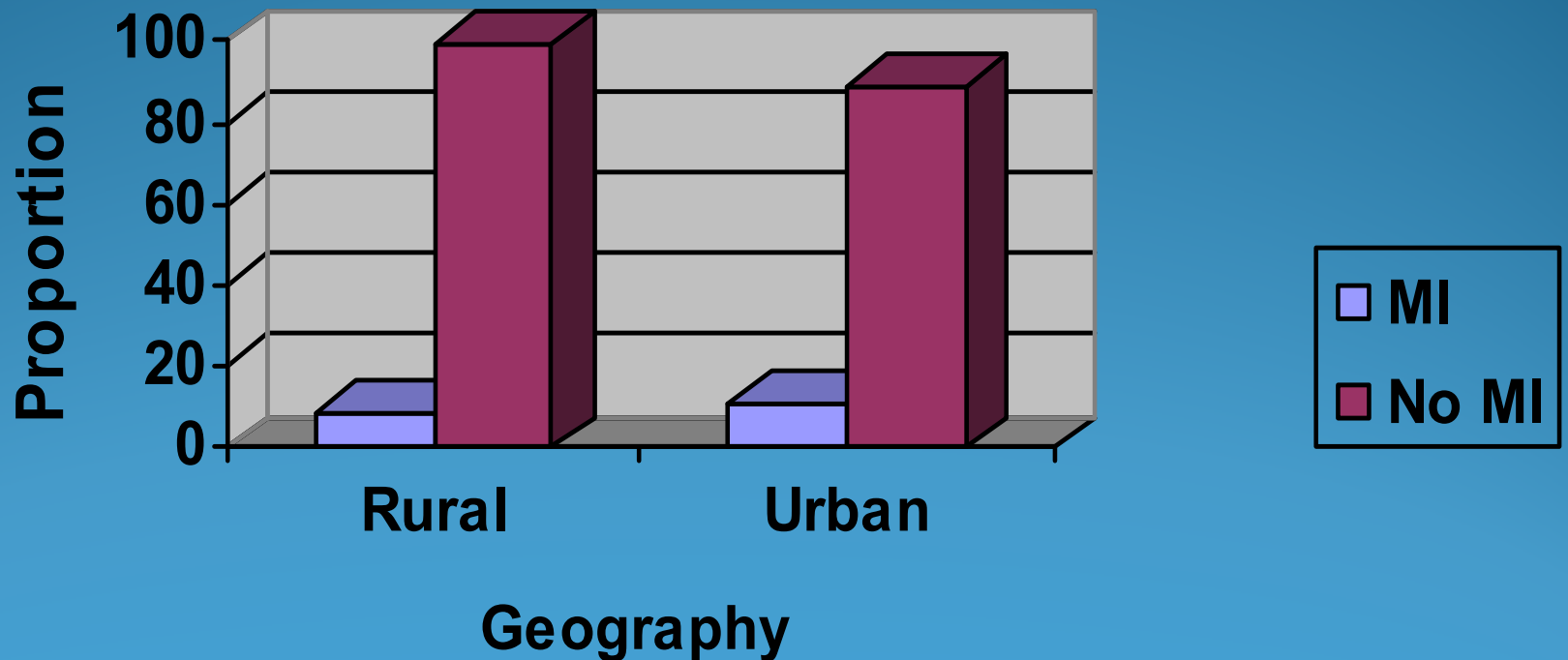


Specifics of Gender Differences

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

Residential Geography

Proportion of Seniors with & without mental illness across Geography

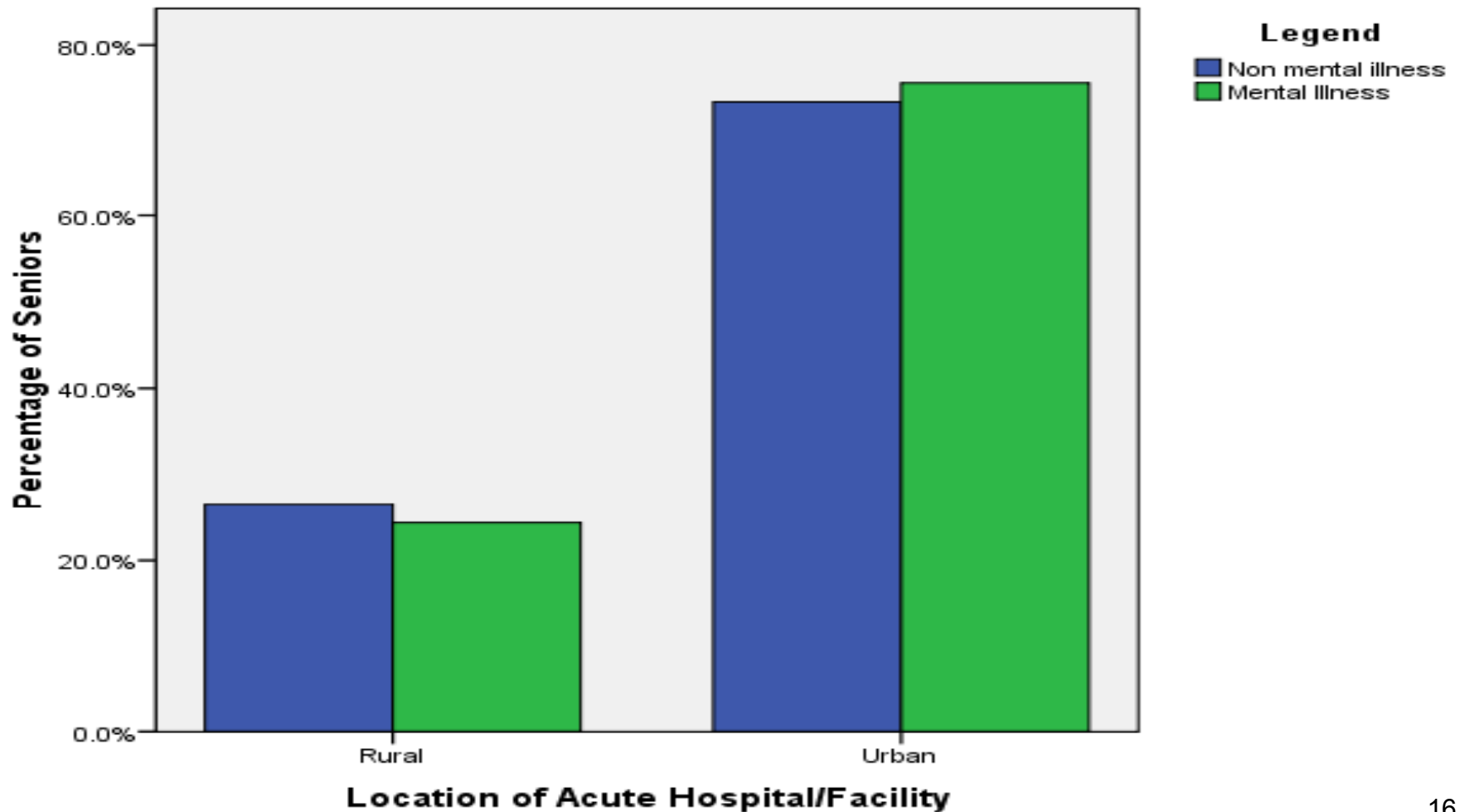


Specifics of Residential Geography

Variable (Means)	Urban with MIs	Rural with MIs	P value
Frequency	45% (n=558)	55% (n=677)	p < 0.001
LOS	32.0	27.0	P < 0.001 (S)
ALOS	18.77	17.41	p= 0.042 (S)
ROA	1.67	1.80	p= 0.907 (NS)
ER wait time	4.89	6.03	p= 0.330 (NS)
RIW	5.6	3.9	p= 0.001 (S)
Cost	24,765	15,796	p < 0.001 (S)

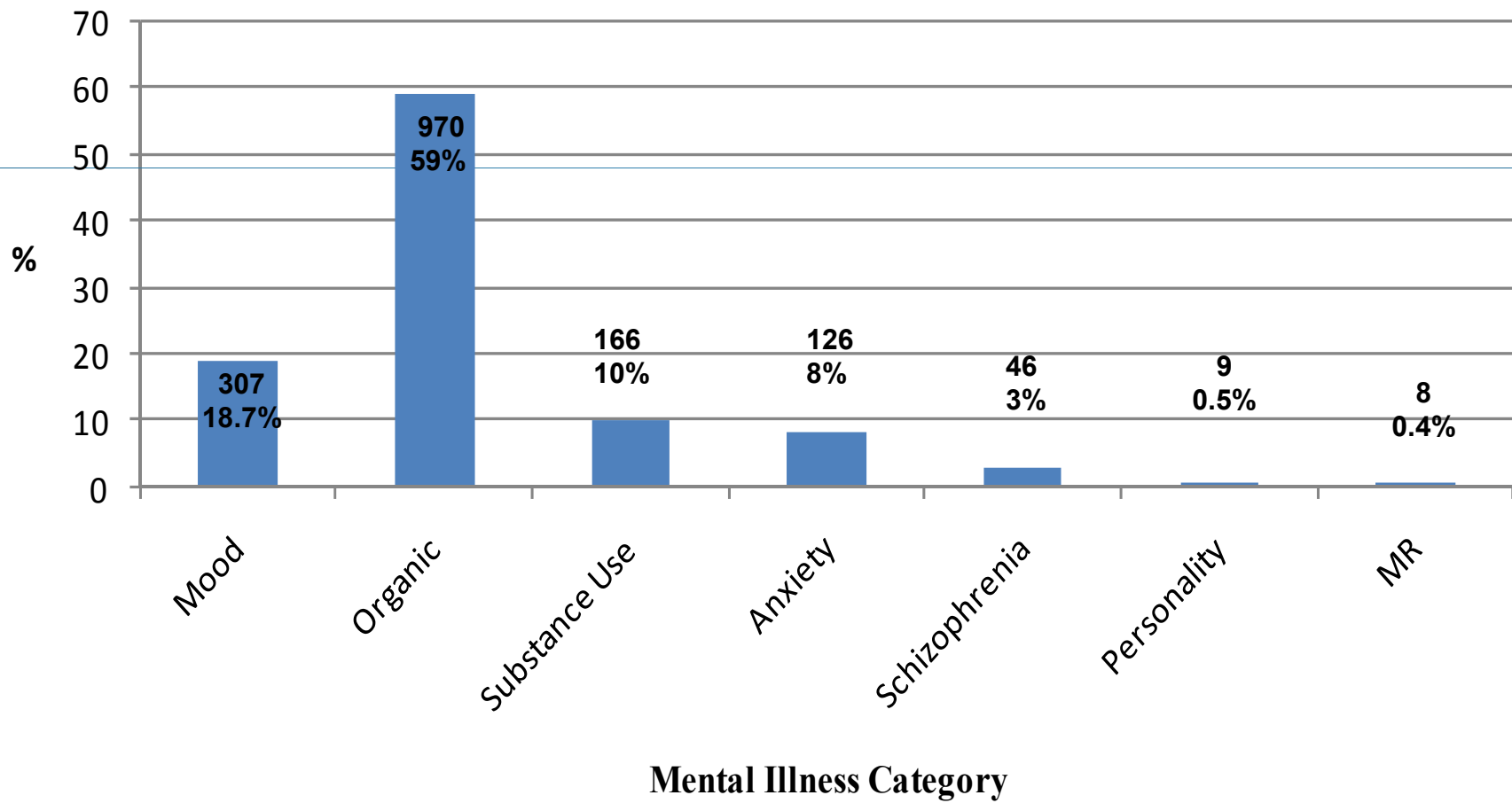
Facility Geography

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



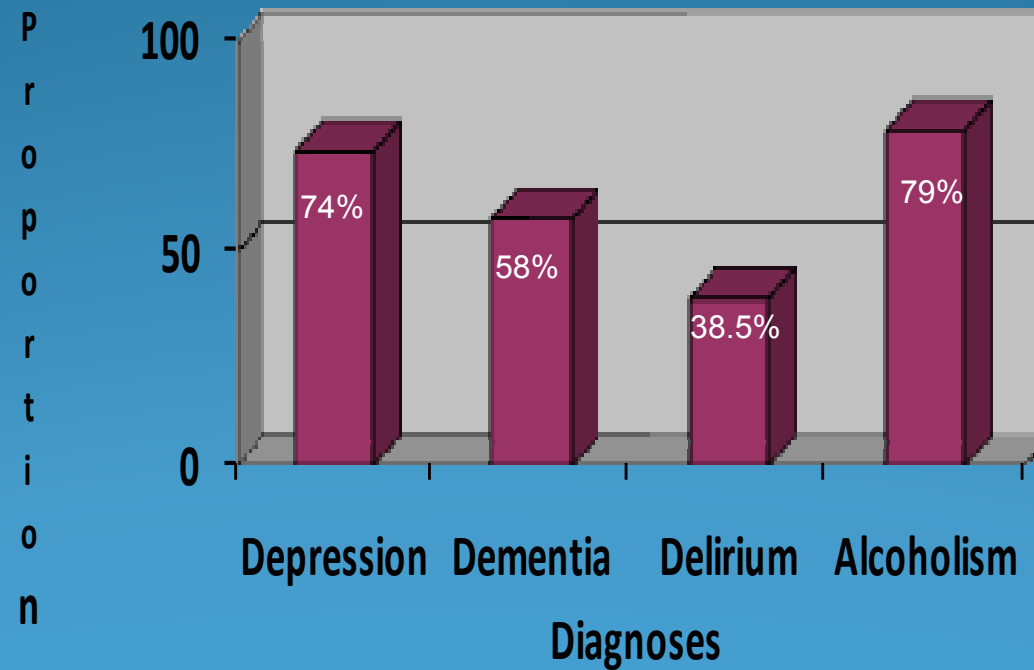
Variation among categories

Distribution of Mental Illness Codes in Seniors



Mental Illness Specifics

Prevalence of Specific Mental Illnesses in Seniors



Service Use Results (Crude)

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

Adjustments overall

Service Utilization	Seniors with MI codes	Seniors w/o MI codes	p-value
Total LOS (days)	24.5	11.1	p < 0.001
Acute LOS (days)	8.8	16.4	p < 0.001
Mean number of admissions	1.8	1.5	p < 0.001
ER wait time (hrs)	5.5	4.8	p = 0.048
RIW	4.0	2.1	p < 0.001
Costs (\$)	16,731	9,059	p < 0.001

Adjustments for Cost

Tests of Between-Subjects Effects

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

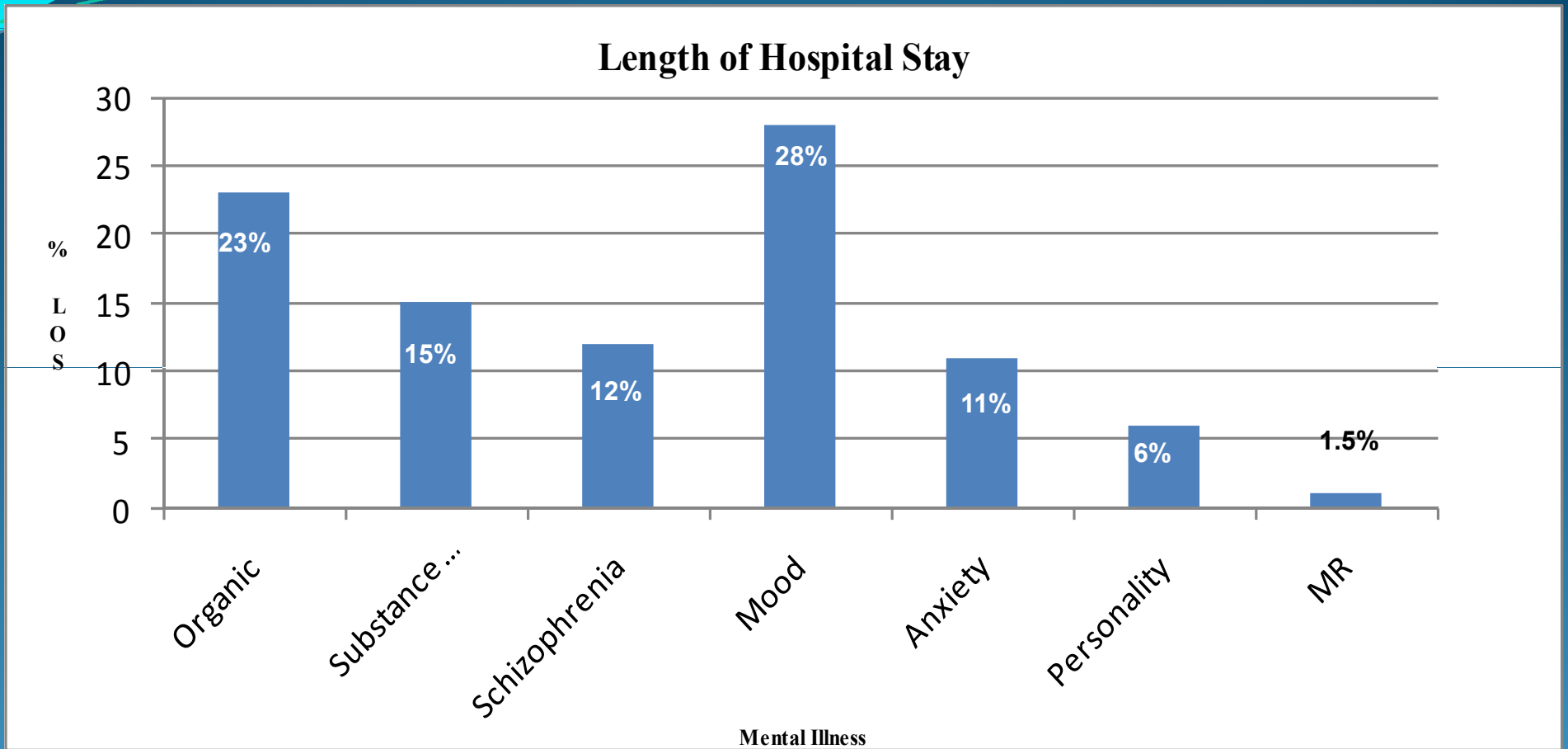
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	5.455E11	19	2.871E10	68.951	.000
Intercept	3.207E10	1	3.207E10	77.028	.000
Gender_first	1.703E9	1	1.703E9	4.090	.043
Age_first	8.864E9	1	8.864E9	21.287	.000
entry_clinic	5.660E8	1	5.660E8	1.359	.244
entry_dept	4.550E8	1	4.550E8	1.093	.296
Entry_code_ER	3.236E8	1	3.236E8	.777	.378
Readmit_planned	3.668E8	1	3.668E8	.881	.348
Acute_seven	1.164E9	1	1.164E9	2.796	.095
Acute_8_28	3.260E8	1	3.260E8	.783	.376
Acute_daysurgery	5.526E8	1	5.526E8	1.327	.249
DD_LTC	4.196E10	1	4.196E10	100.781	.000
DD_Other	6.090E9	1	6.090E9	14.625	.000
DD_Home_Support	1.079E8	1	1.079E8	.259	.611
DD_Home	4.432E9	1	4.432E9	10.643	.001
DD_AMA	1.194E9	1	1.194E9	2.869	.090
DD_Died	3.970E10	1	3.970E10	95.334	.000
Rural_urban_residence_first	1.314E9	1	1.314E9	3.155	.076
Rural_urban_facility_first	1.329E10	1	1.329E10	31.916	.000
CCI	7.556E8	1	7.556E8	1.815	.178
MIGroup_max	6.147E10	1	6.147E10	147.622	.000
Error	5.197E12	12482	4.164E8		
Total	6.948E12	12502			
Corrected Total	5.743E12	12501			

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

Correlations

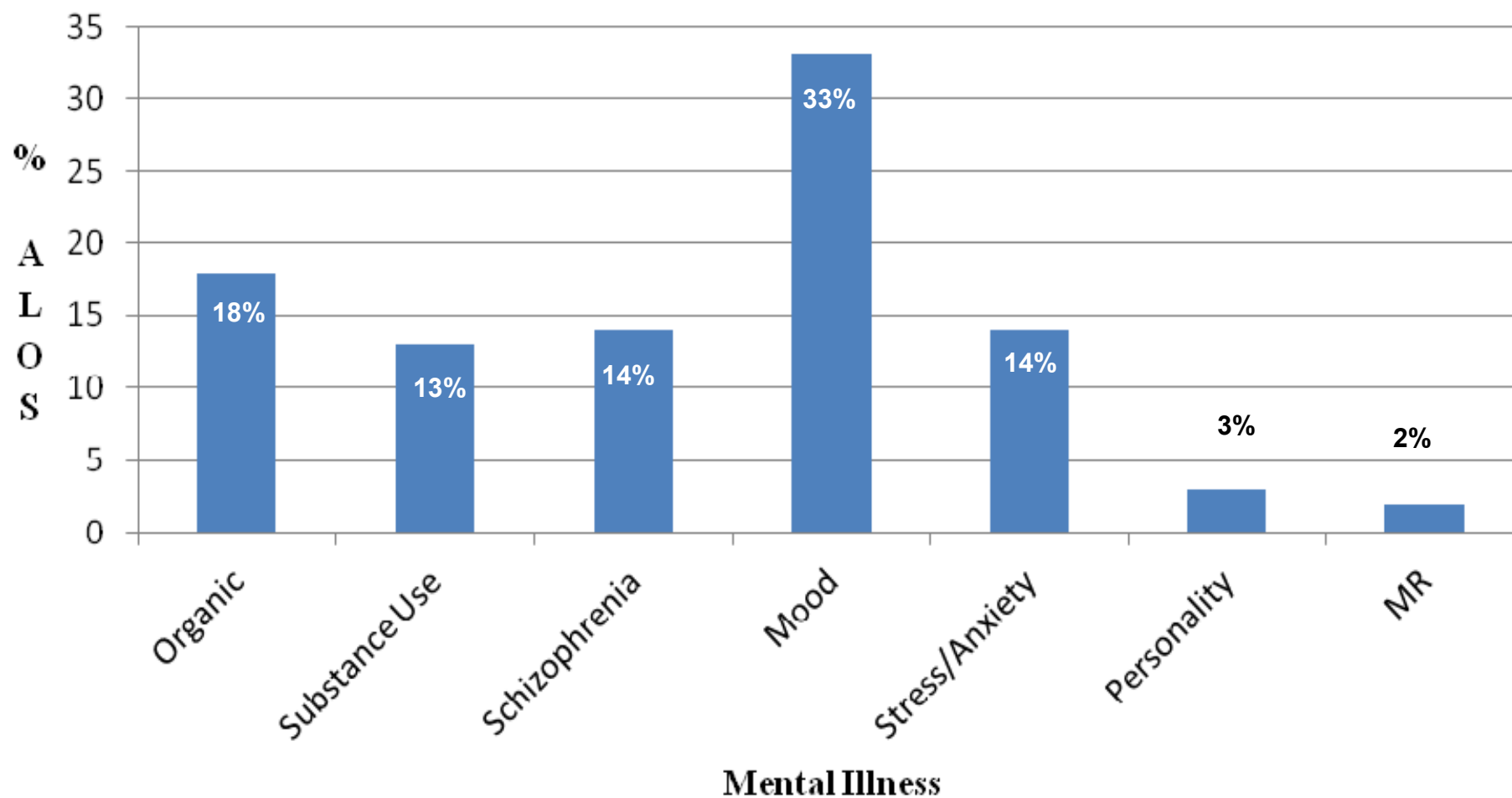
Variable	LOS	ALOS	RIW	Cost	ER wait time
LOS	1	.766	.763	.720	.023
ALOS		1	.685	.590	.033
RIW			1	.880	-.001
Cost				1	-.003
ER wait time					1

Total LOS across categories

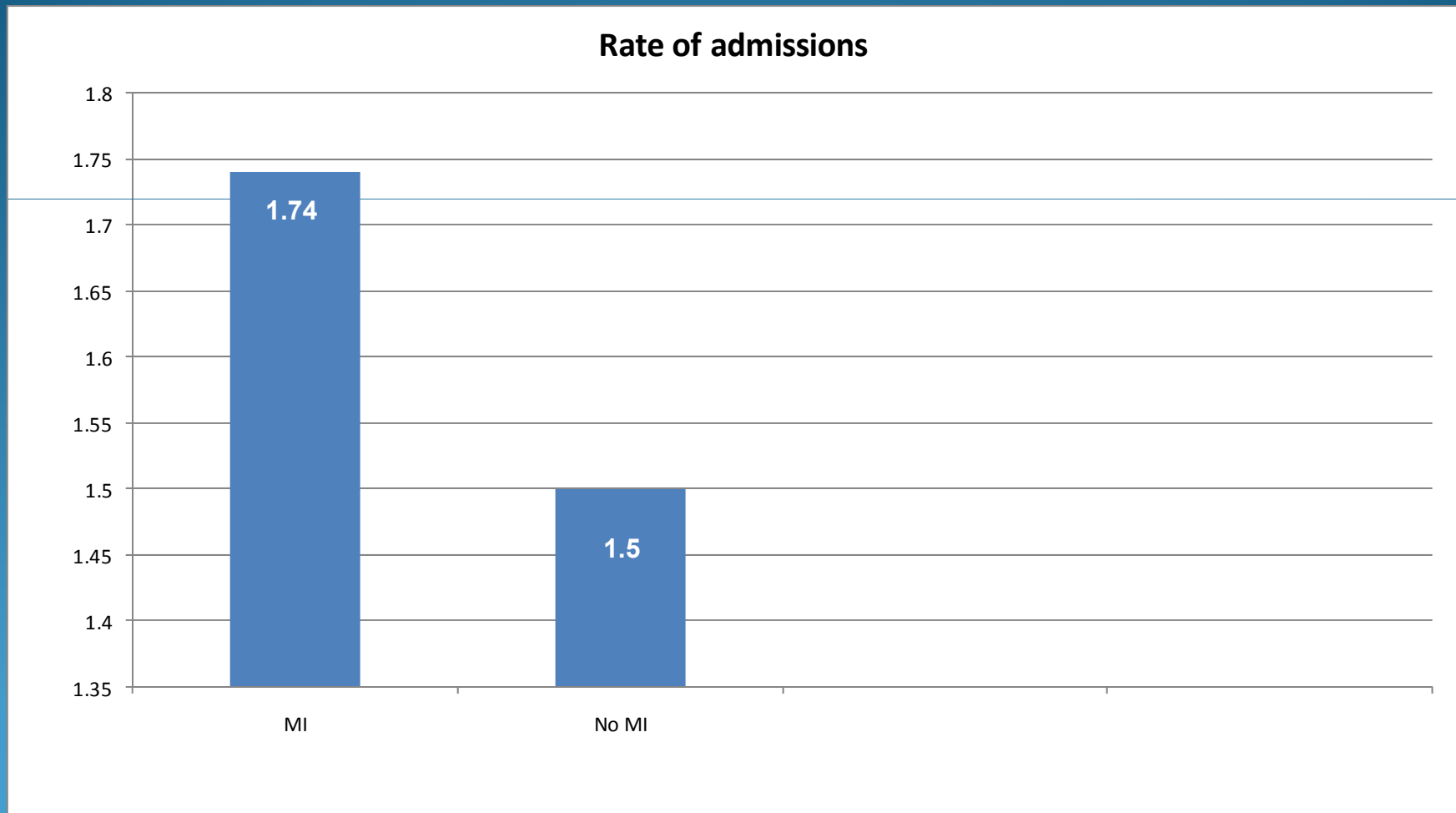


Acute LOS across categories

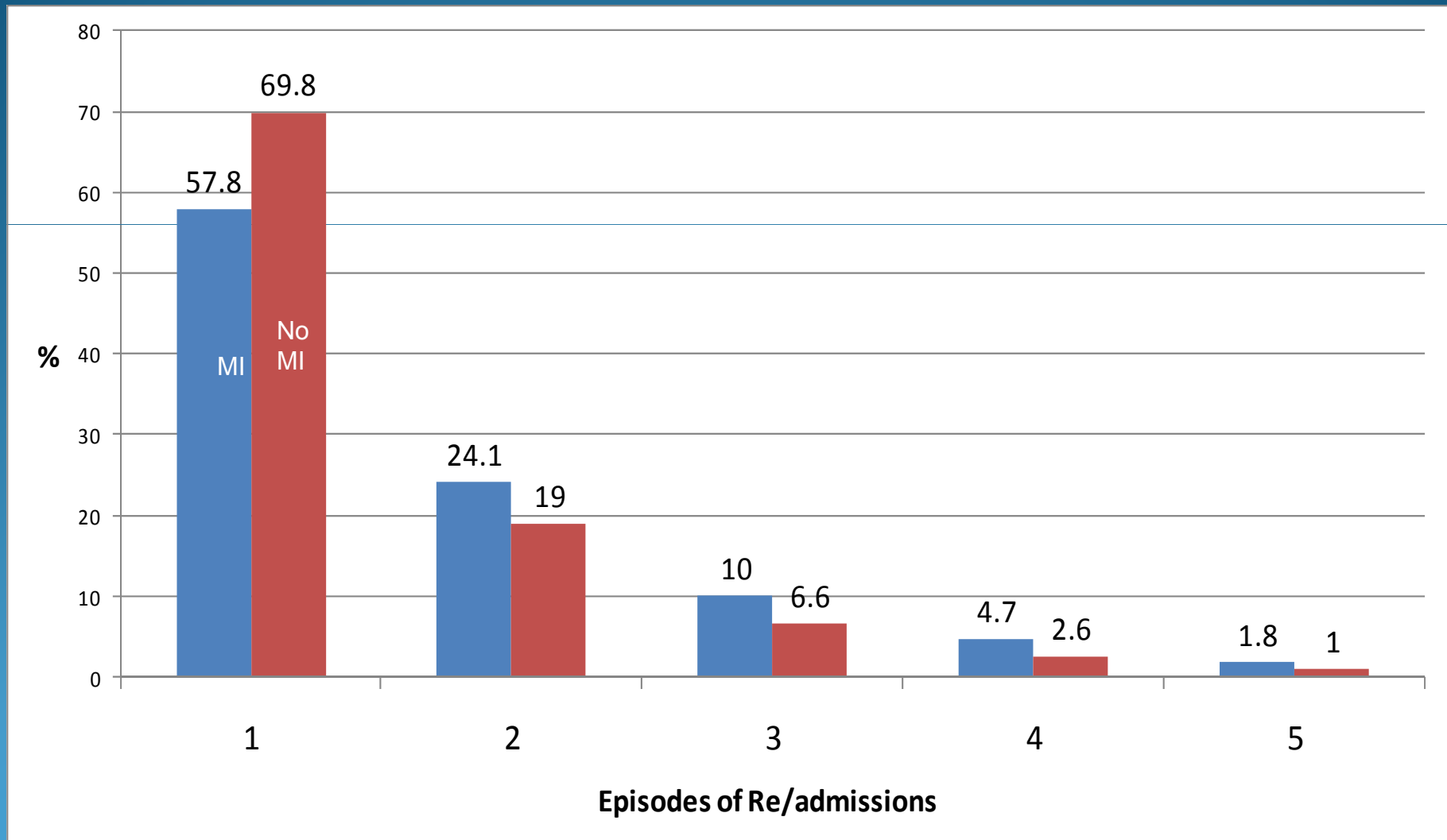
Acute Length of Stay for Seniors with Mental Illnesses



Rate of Admissions

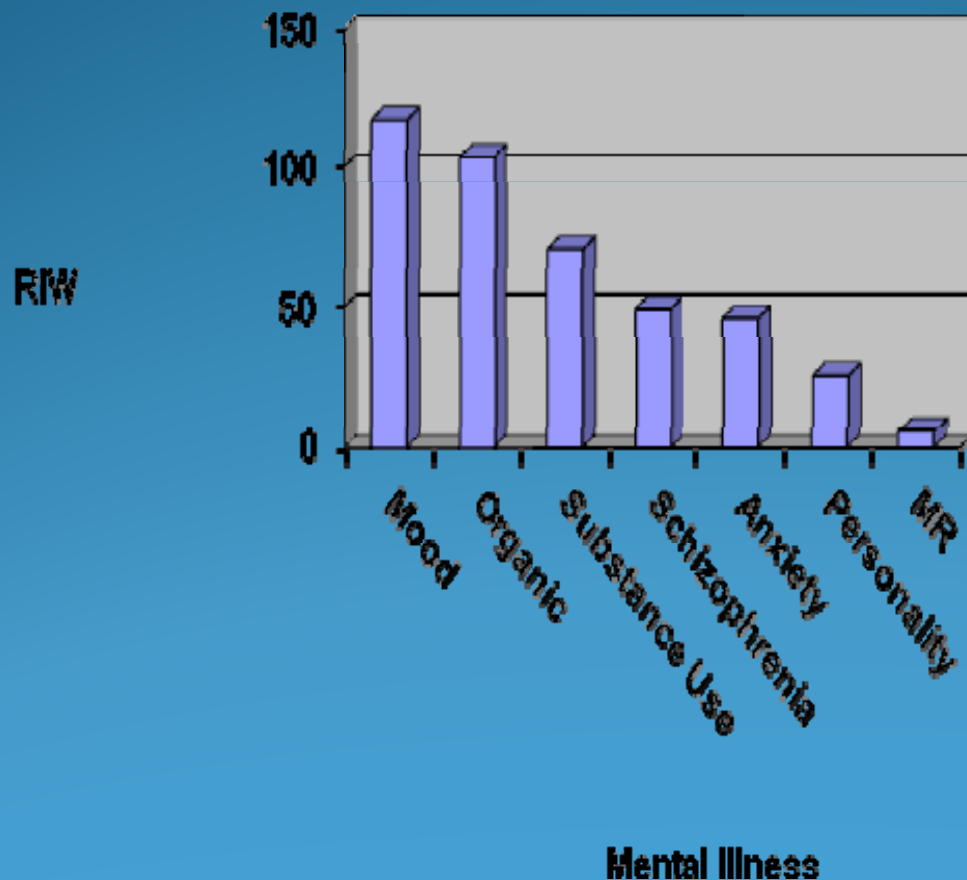


of Re/admissions for Seniors



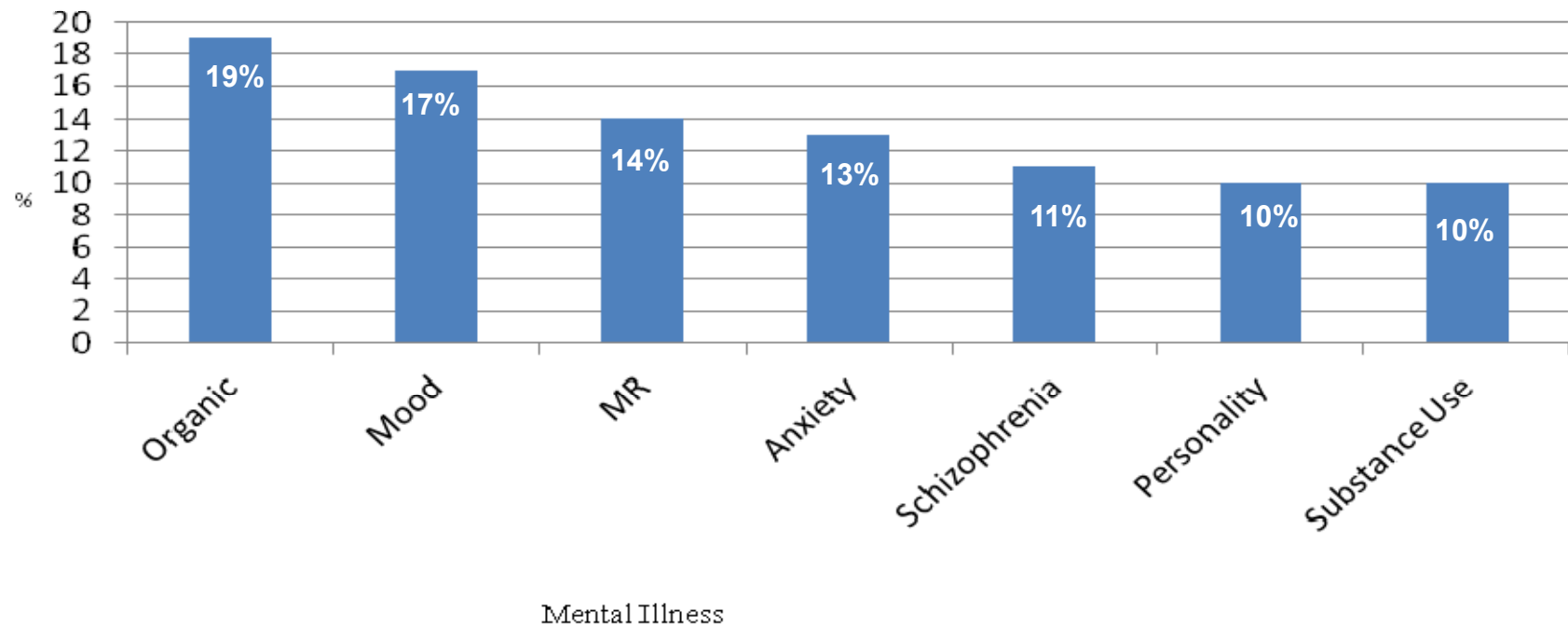
Resource Intensity Weight across categories

Mental Illnesses and their accompanying Cumulative Resource Intensity Weight



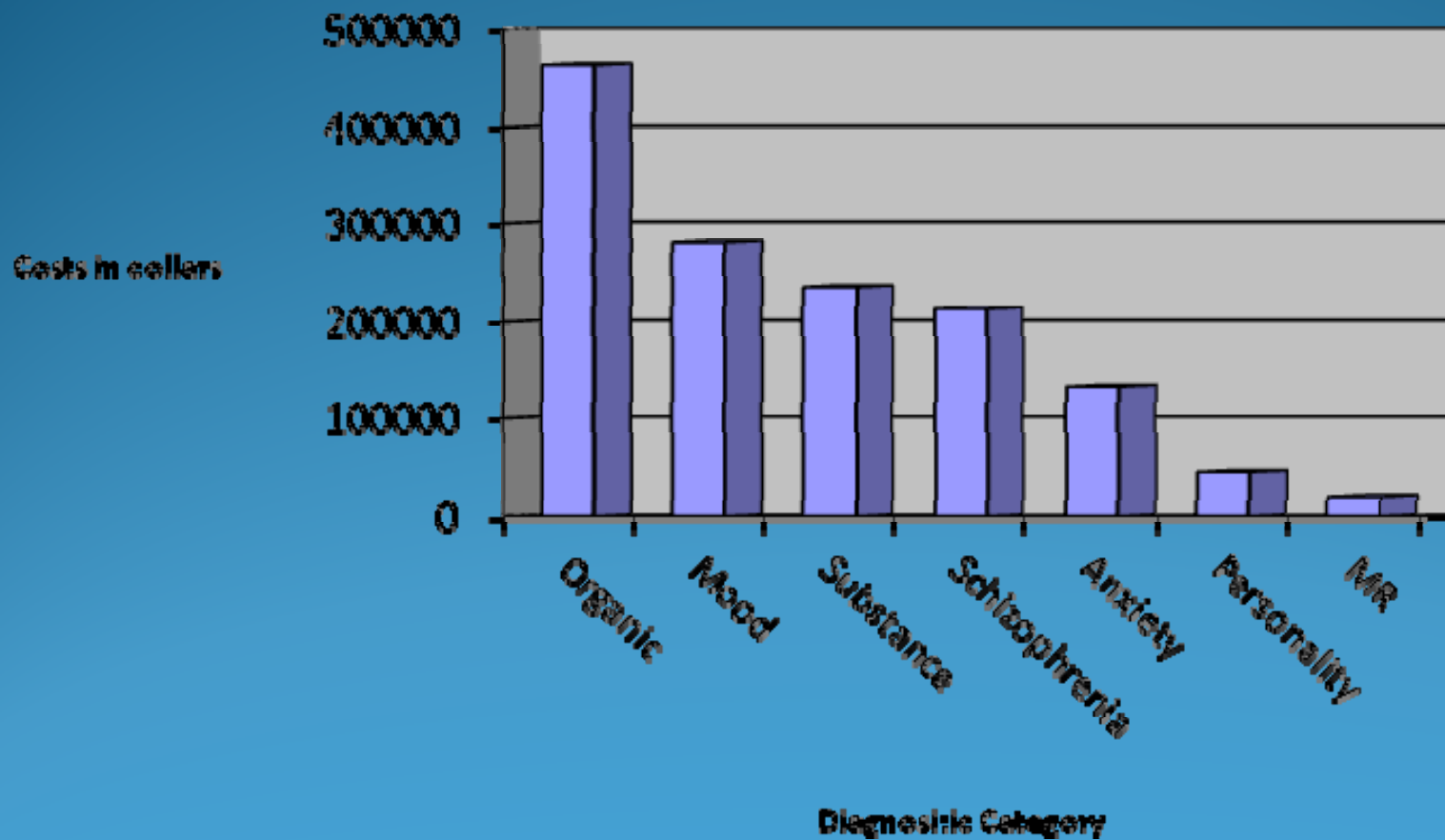
ER Wait Time across categories

Proportion of ER Wait Time



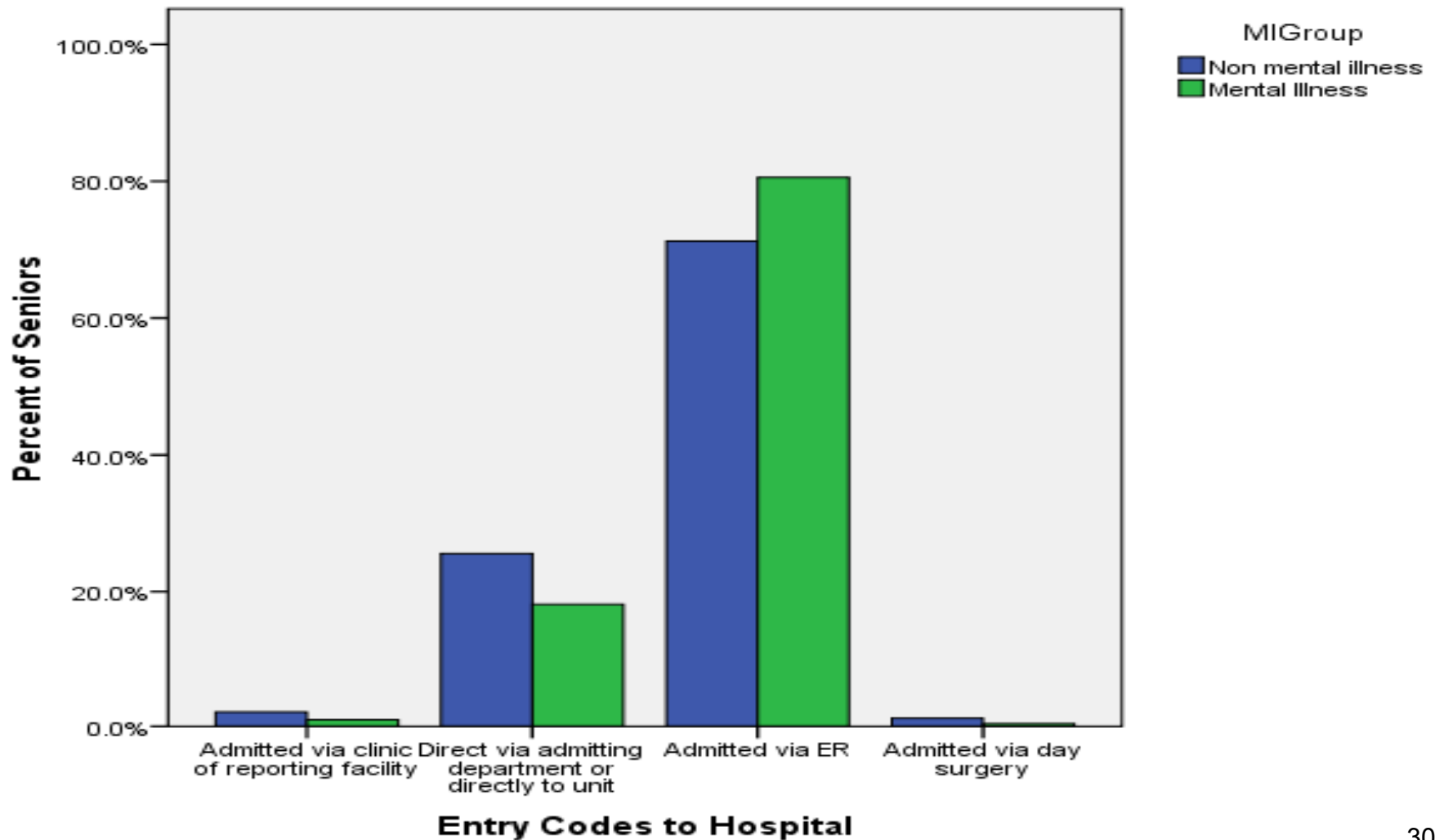
Hospital Costs across categories

Cumulative Costs by Mental Illness Codes Diagnostic Categories



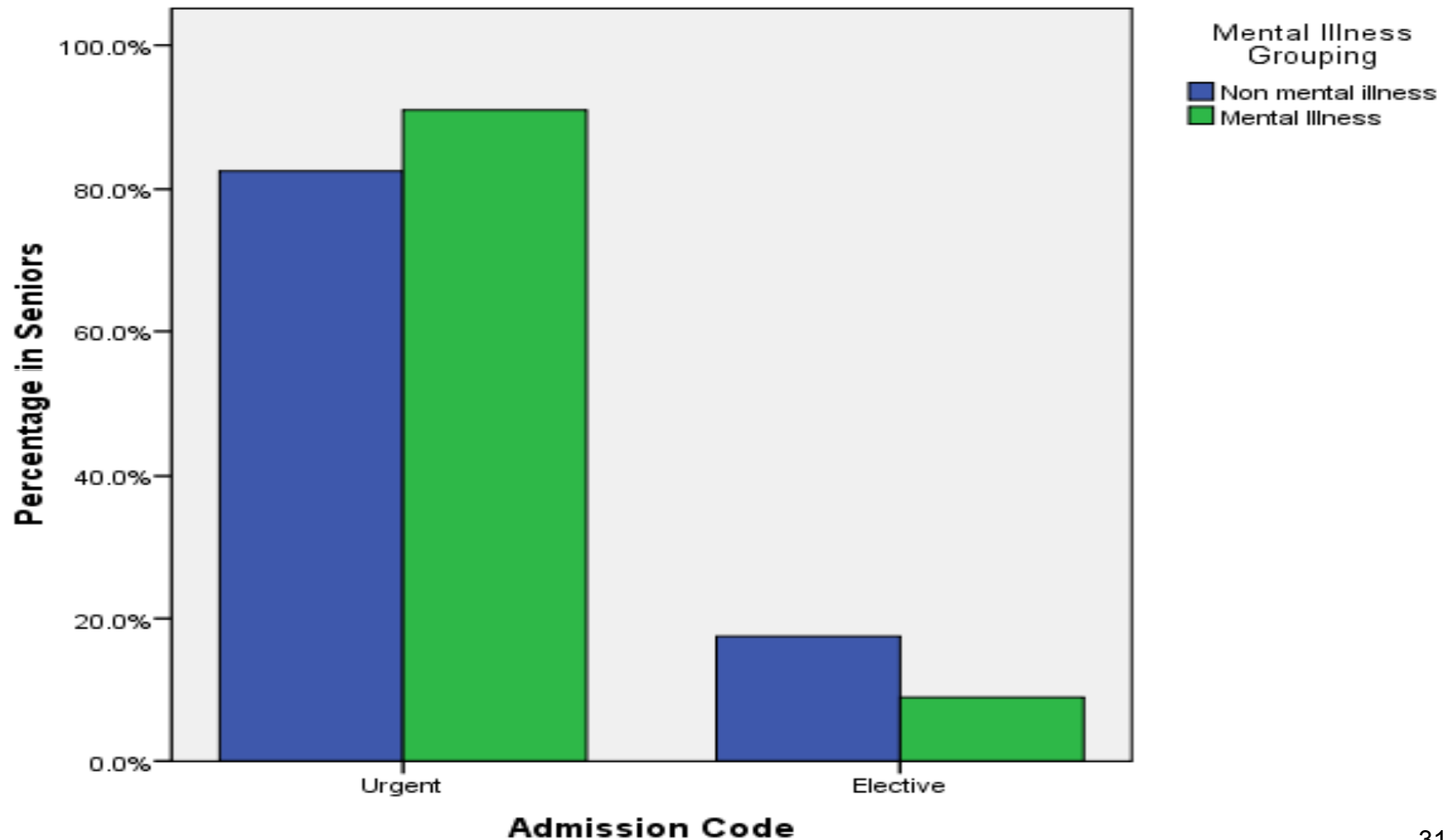
Mode of Entry

Entry Code Comparisons for Seniors with & without Mental Illnesses

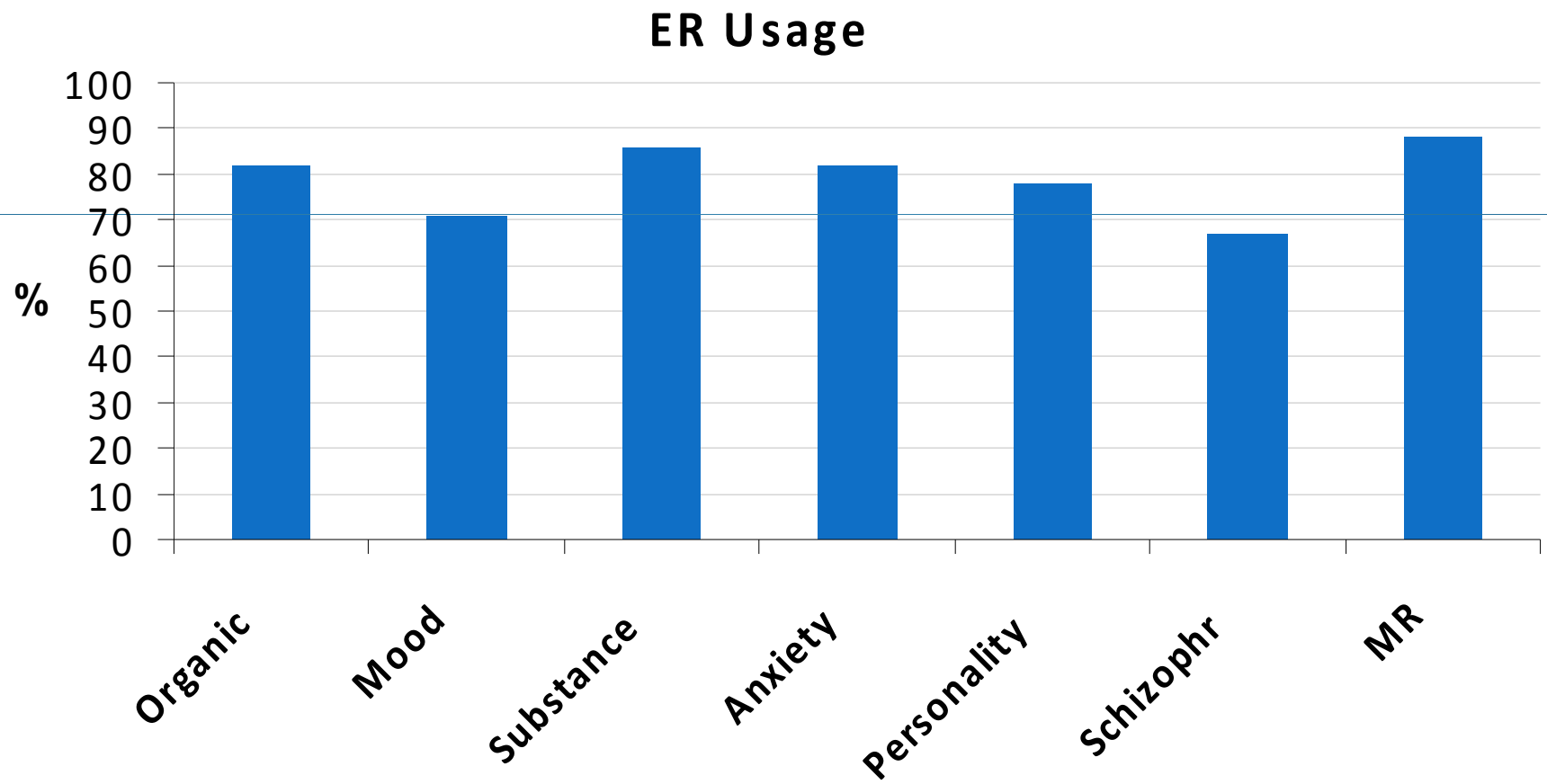


Admission Codes

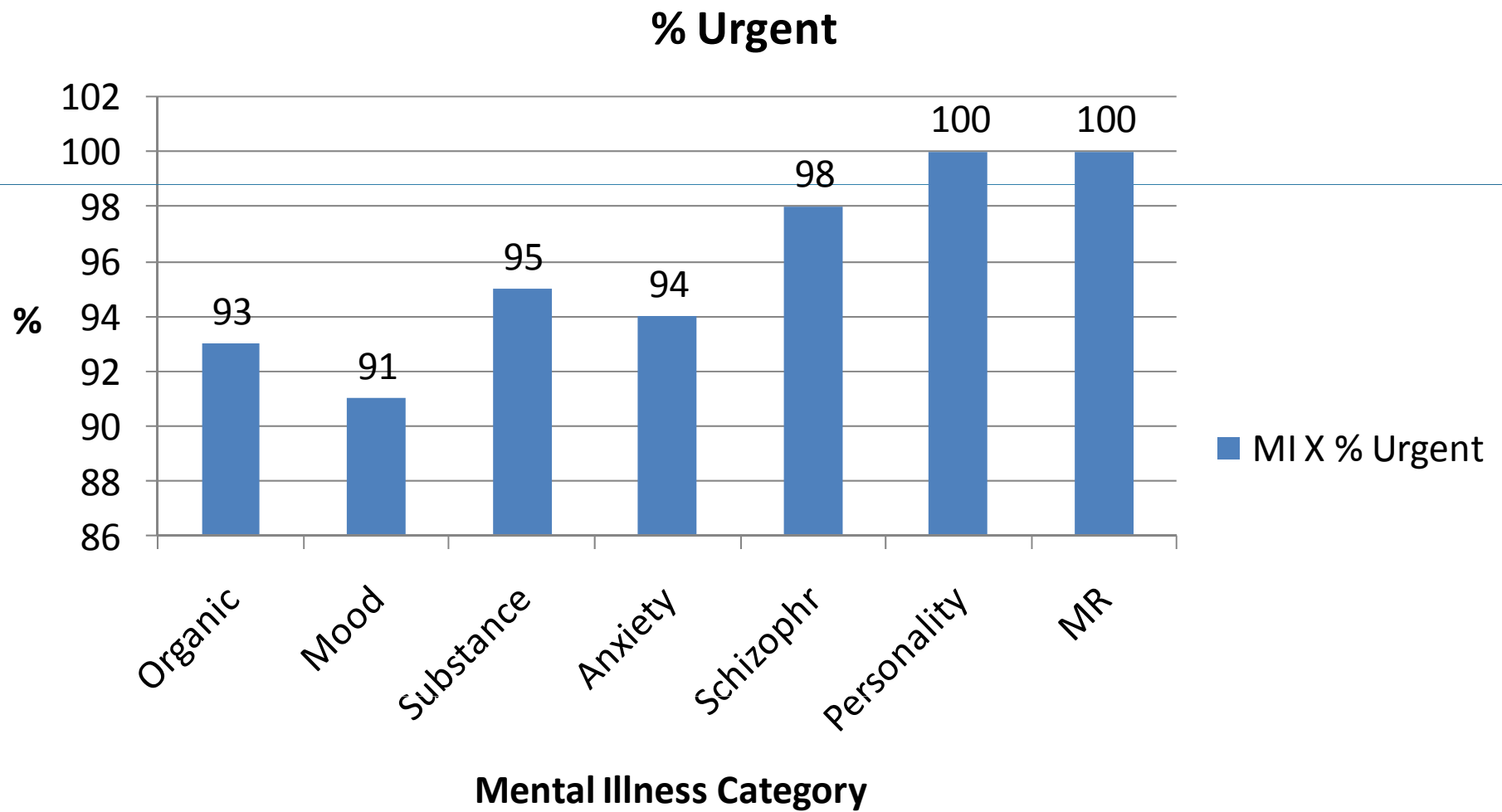
Comparison of Admission Code for Seniors with and without Mental Illnesses



MI categories x Entry Code (% ER)

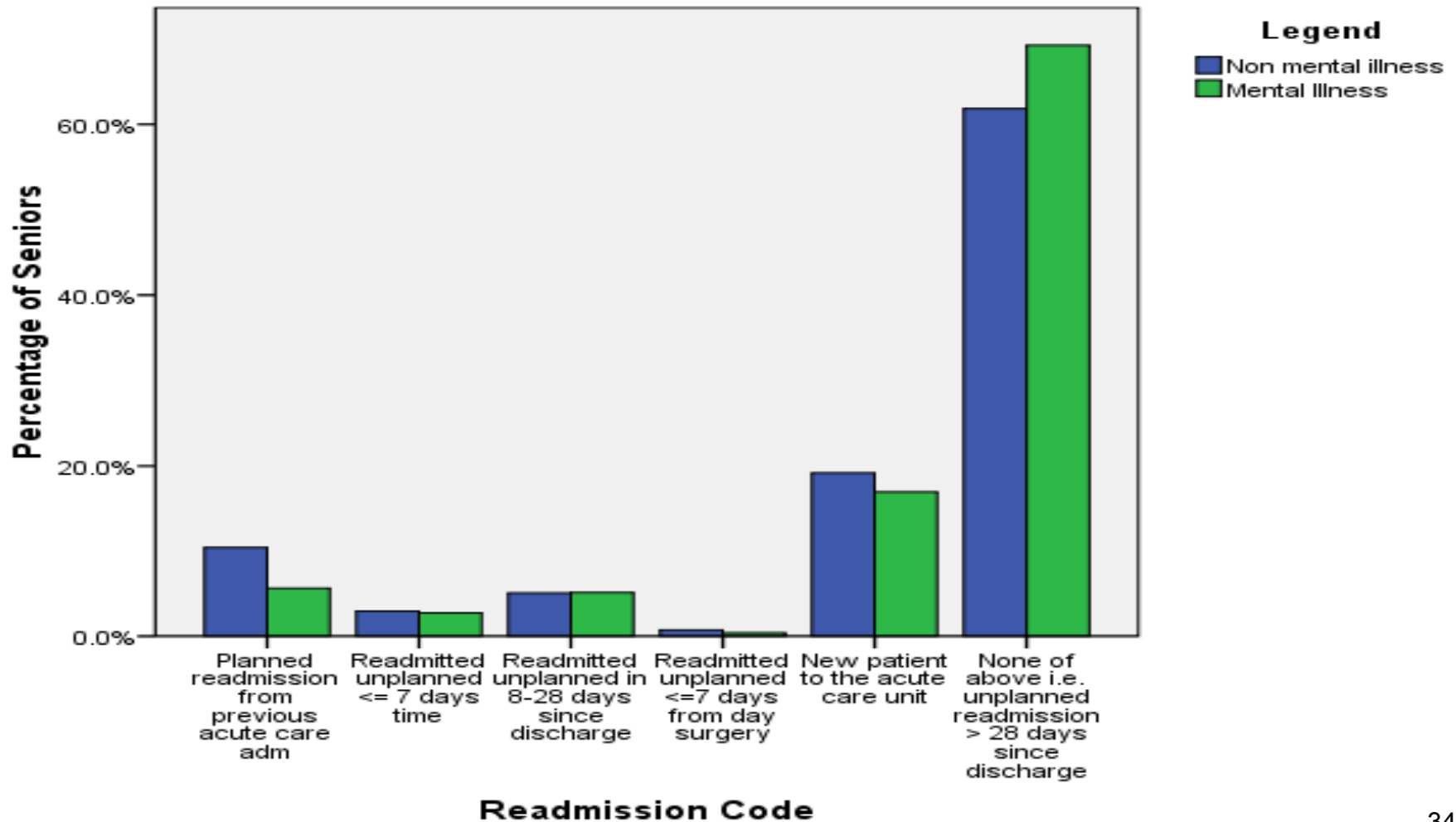


Admission code (% Urgent)

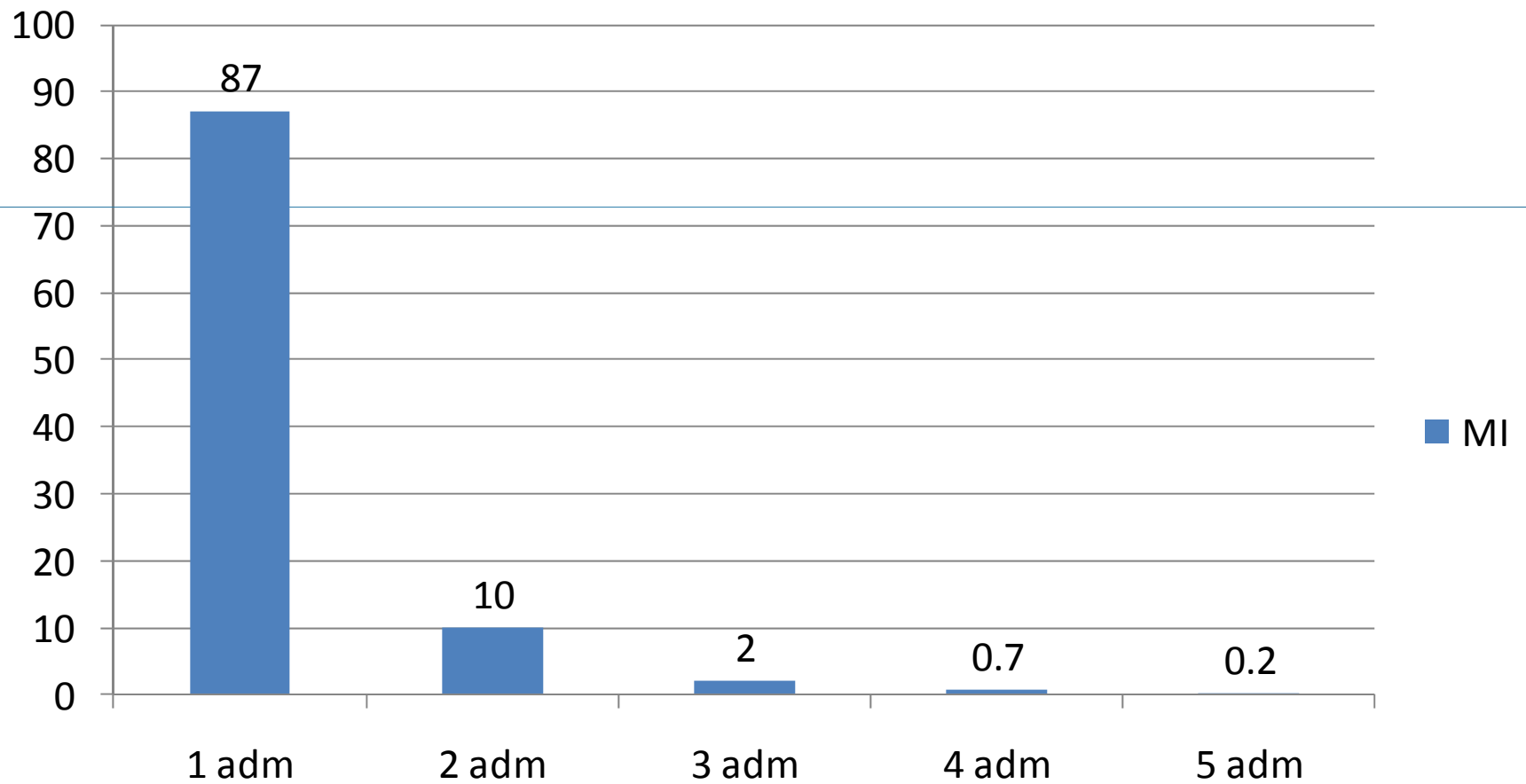


Readmission Codes

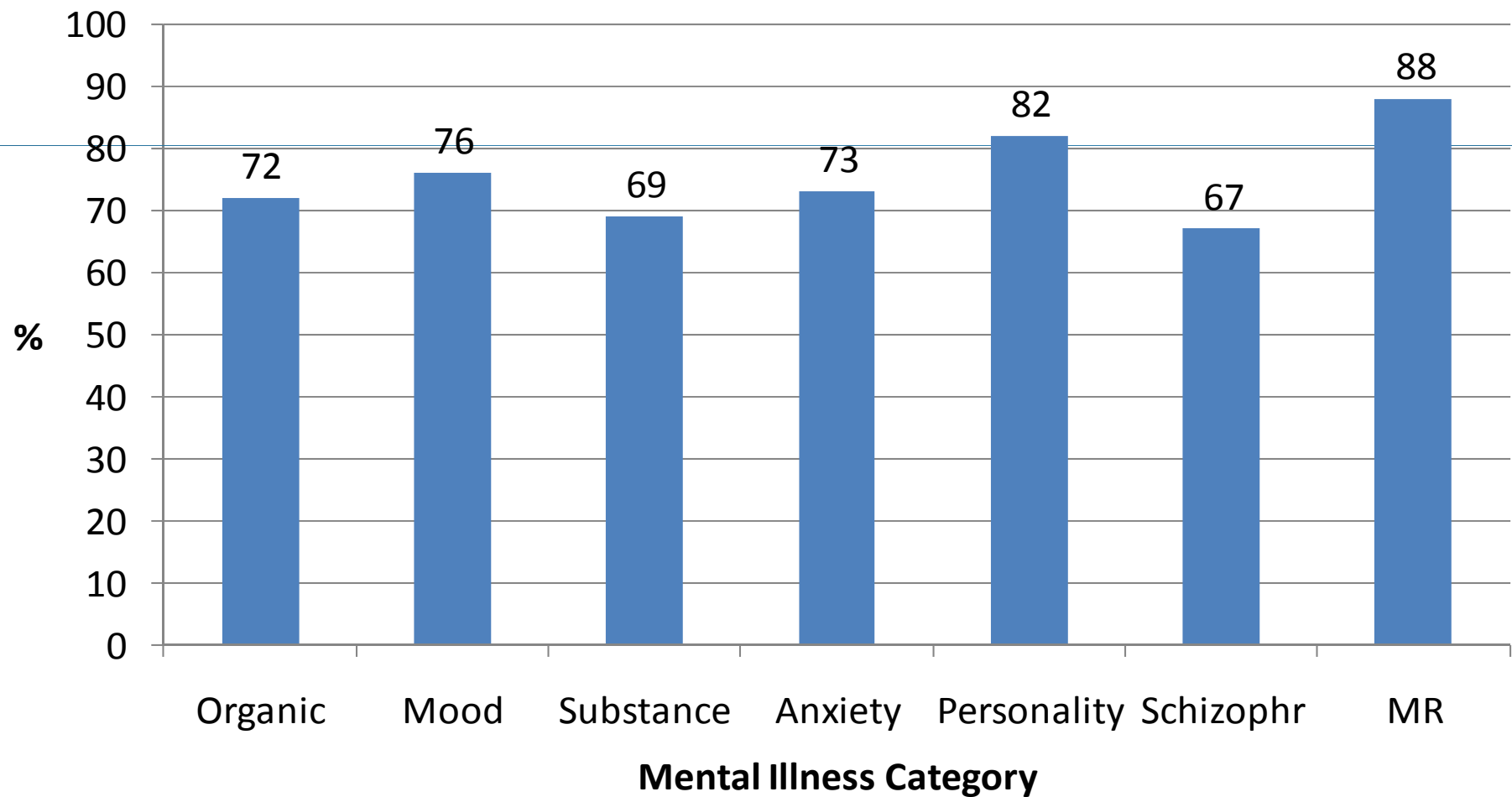
Comparison of Readmission Codes for Seniors with and without Mental Illnesses



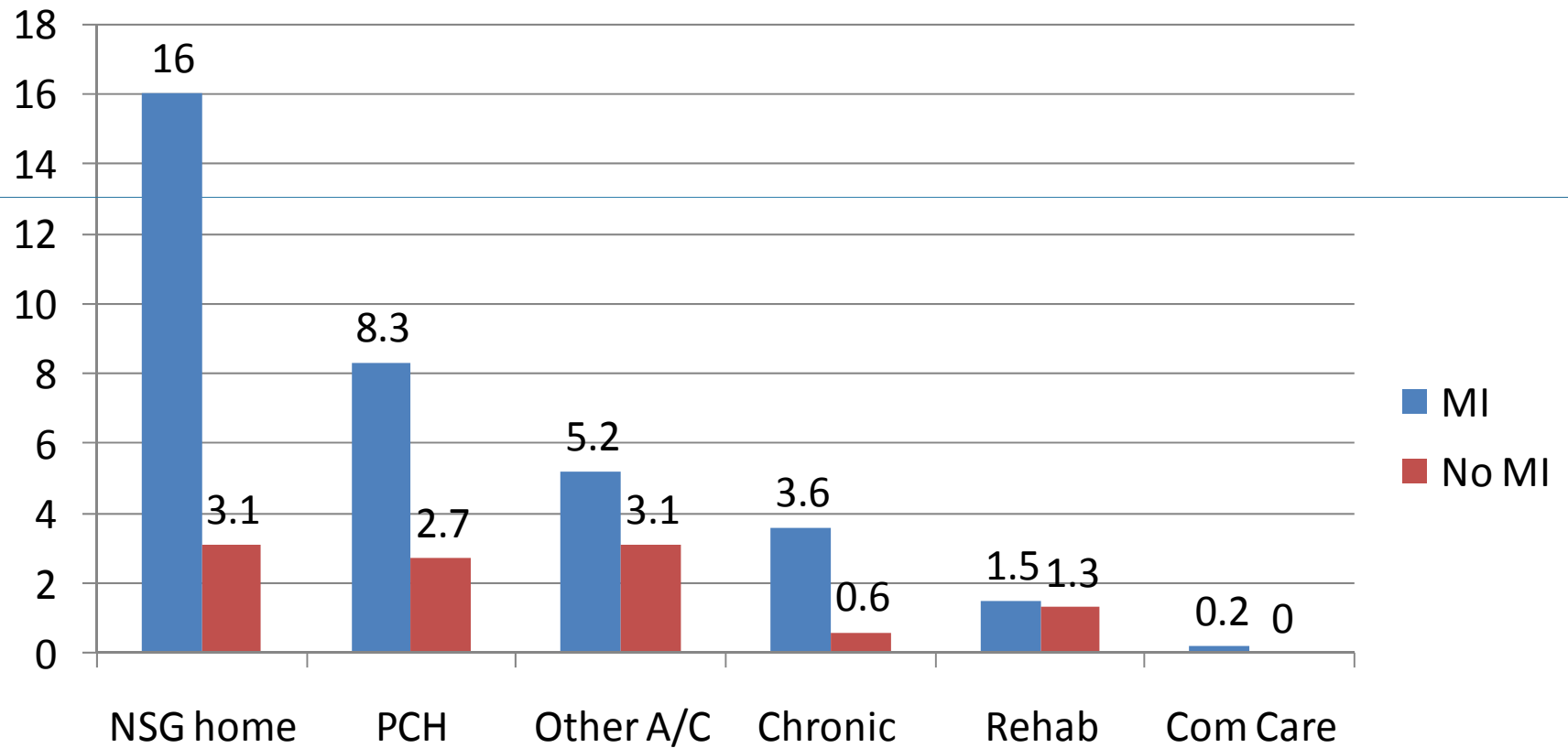
Mental Illness pts only & ROAs



MI categories x Unplanned readmission > 28 days

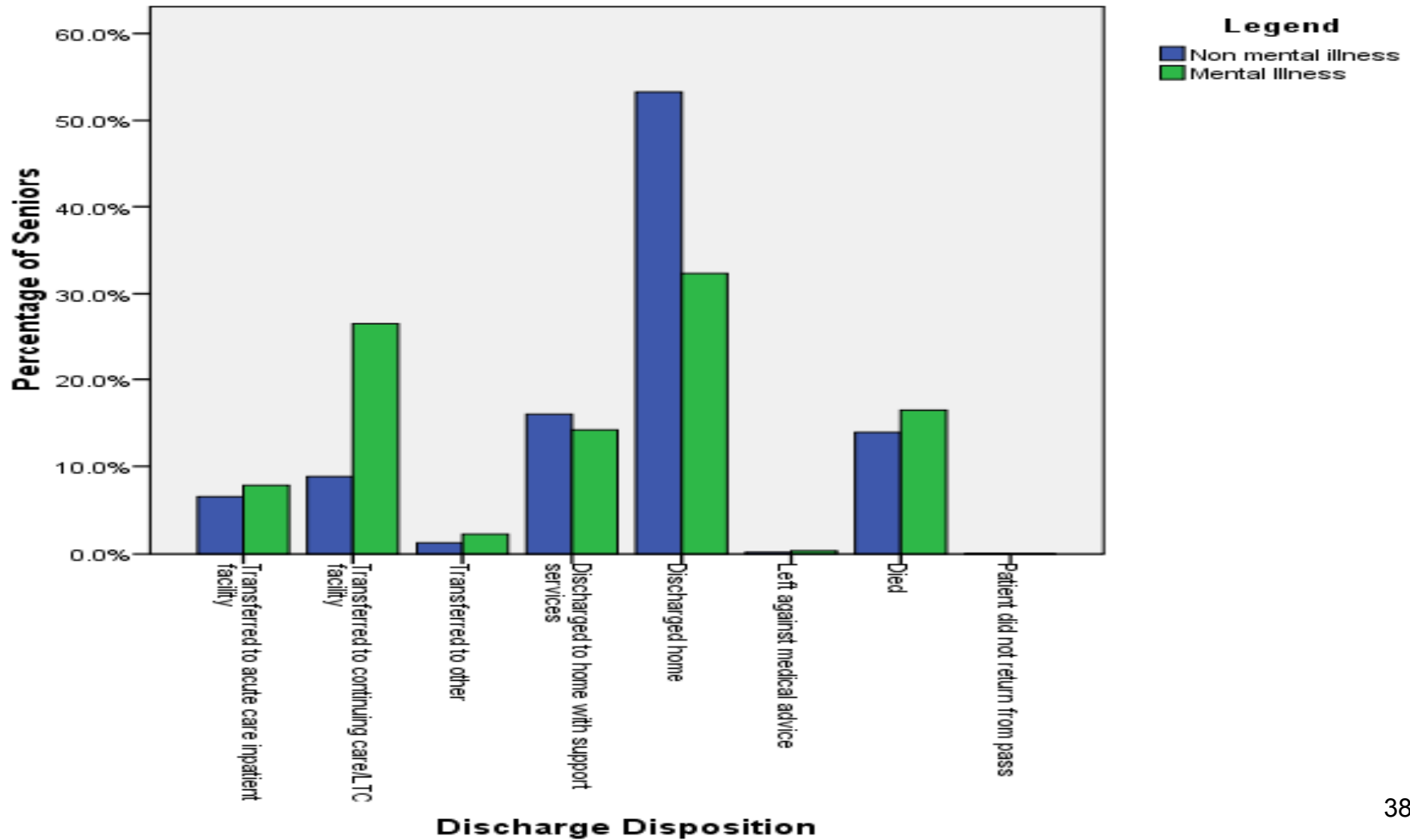


Discharge Destination



Discharge Disposition

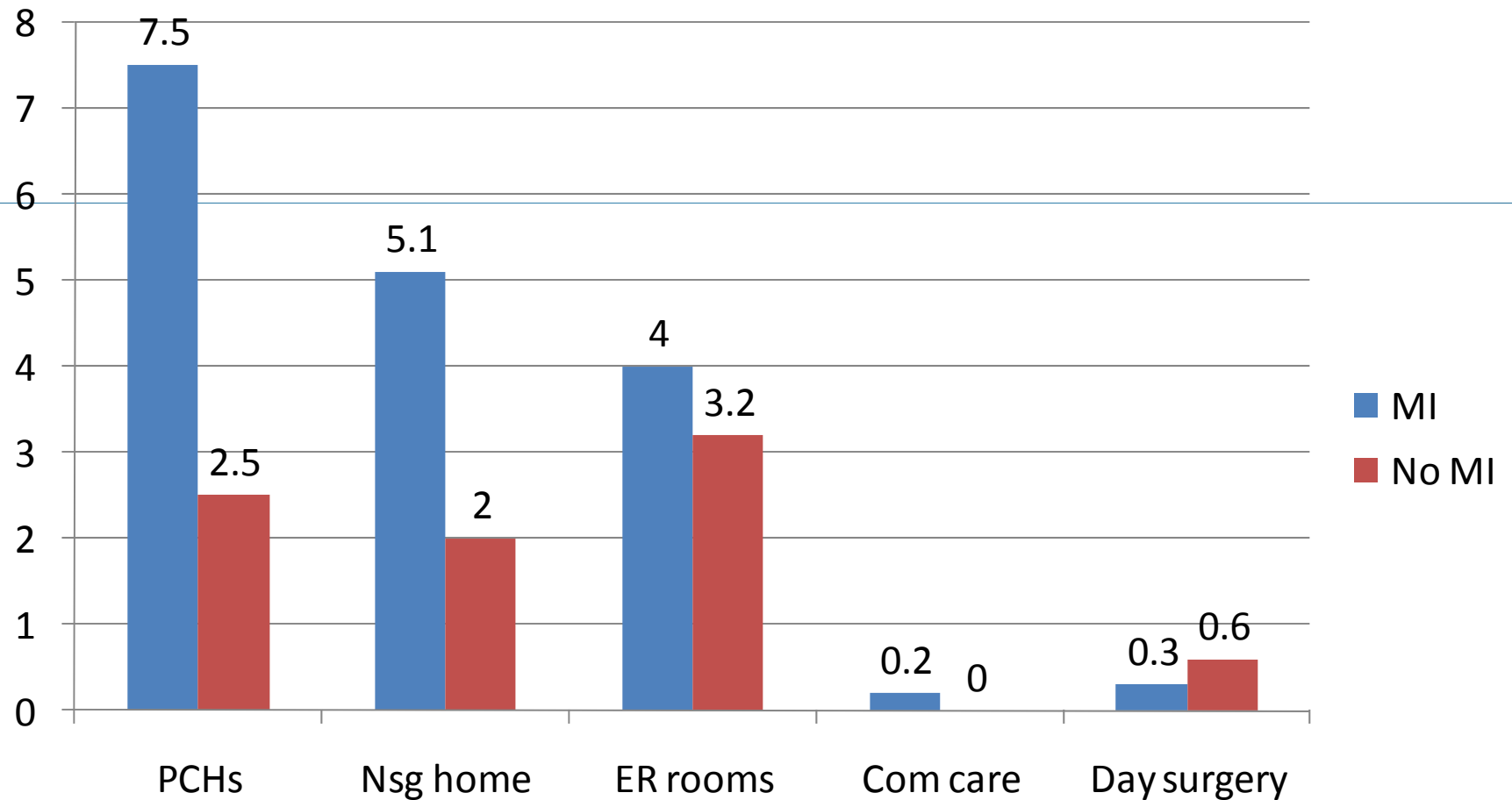
Comparison of Discharge Disposition for Seniors with and without Mental Illnesses



Specifics of Discharge Disposition

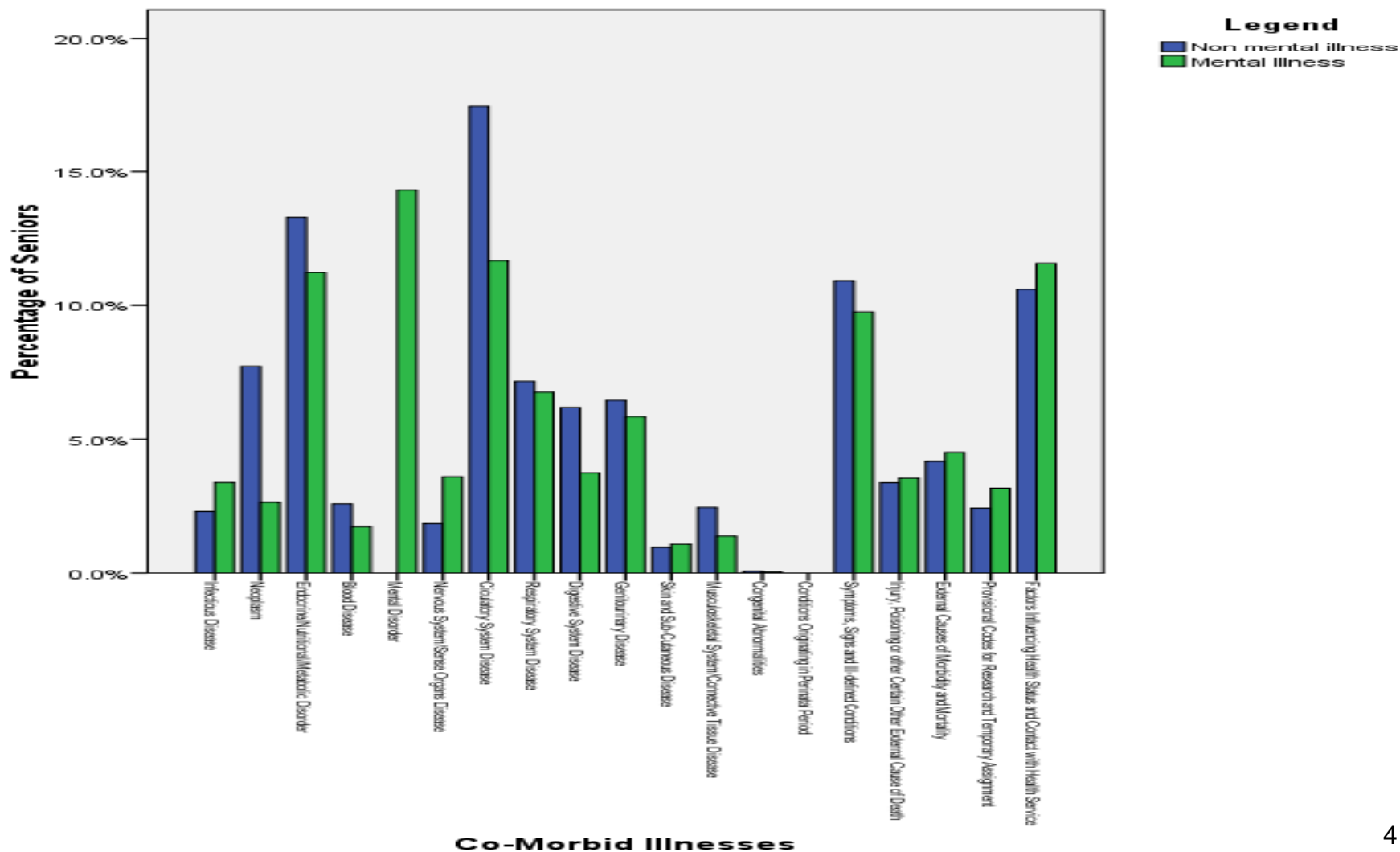
Category of Mental Illness	Most common disposition	% value
Organic	LTC/CC D/C home Died	37% 27% 11.1%
Mood	D/C home LTC/CC Home with supports	56% 21% 11%
Substance Use	D/C home Home with supports LTC/CC	67% 16% 6%
Schizophrenia	D/C home LTC/CC Died	48% 24% 11%
Anxiety	D/C home LTC/CC Home with supports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

Referring Institution



Medical Co-morbidities

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



What's seen most frequently on repeat re/admissions

With 2 admissions:

Organic	50%
Mood	24%
Substance	13%
Anxiety	5%

With 3 admissions:

Organic	49%
Mood	25%
Substance	10%
Anxiety	8%

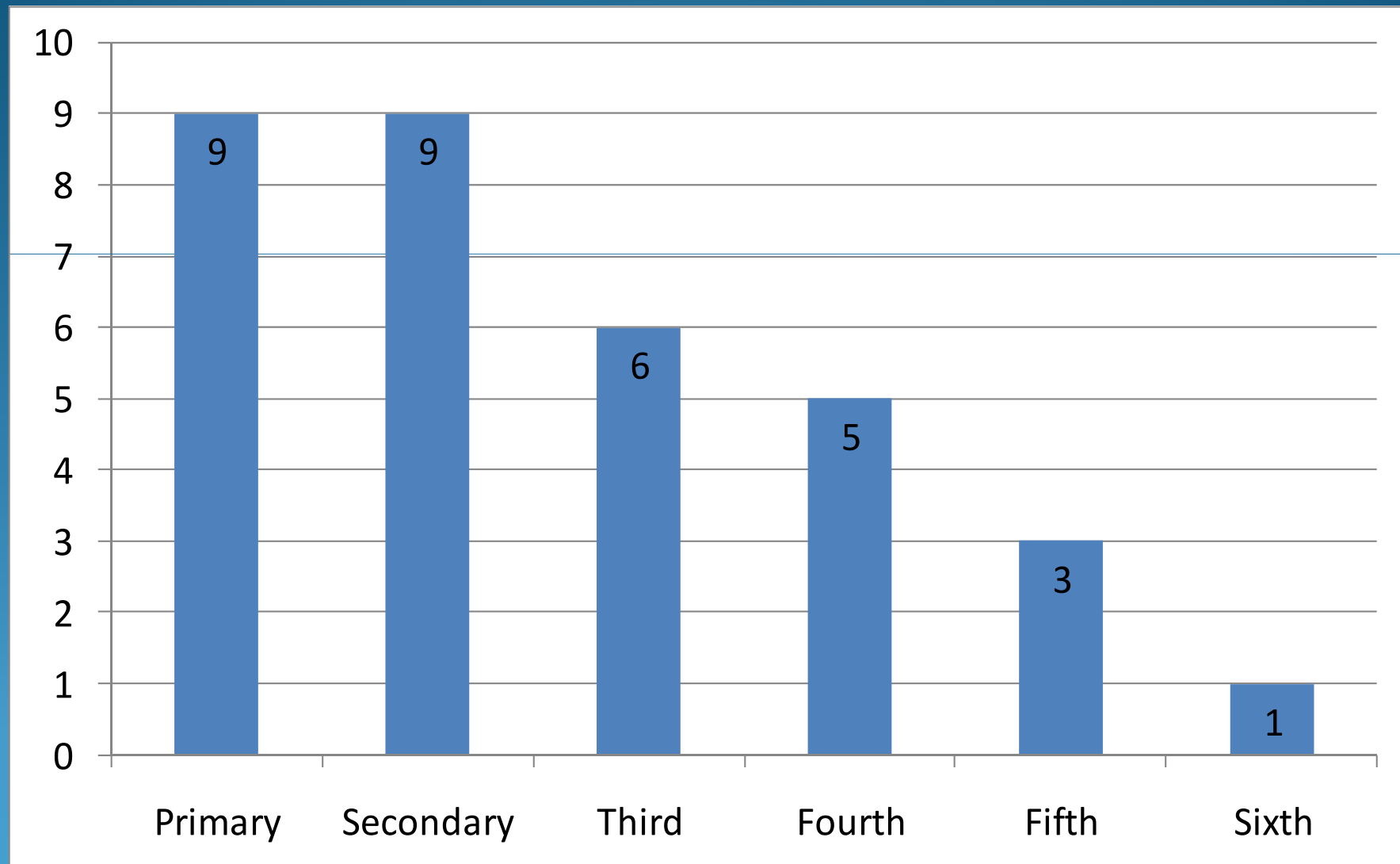
With 4 admissions:

Organic	32%
Mood	27%
Substance	20%
Anxiety	16%

With 5 admissions:

Mood	50%
Personality	25%
Substance	12.5%
Delirium (org.)	12.5%

Placement (%) of mental illness codes

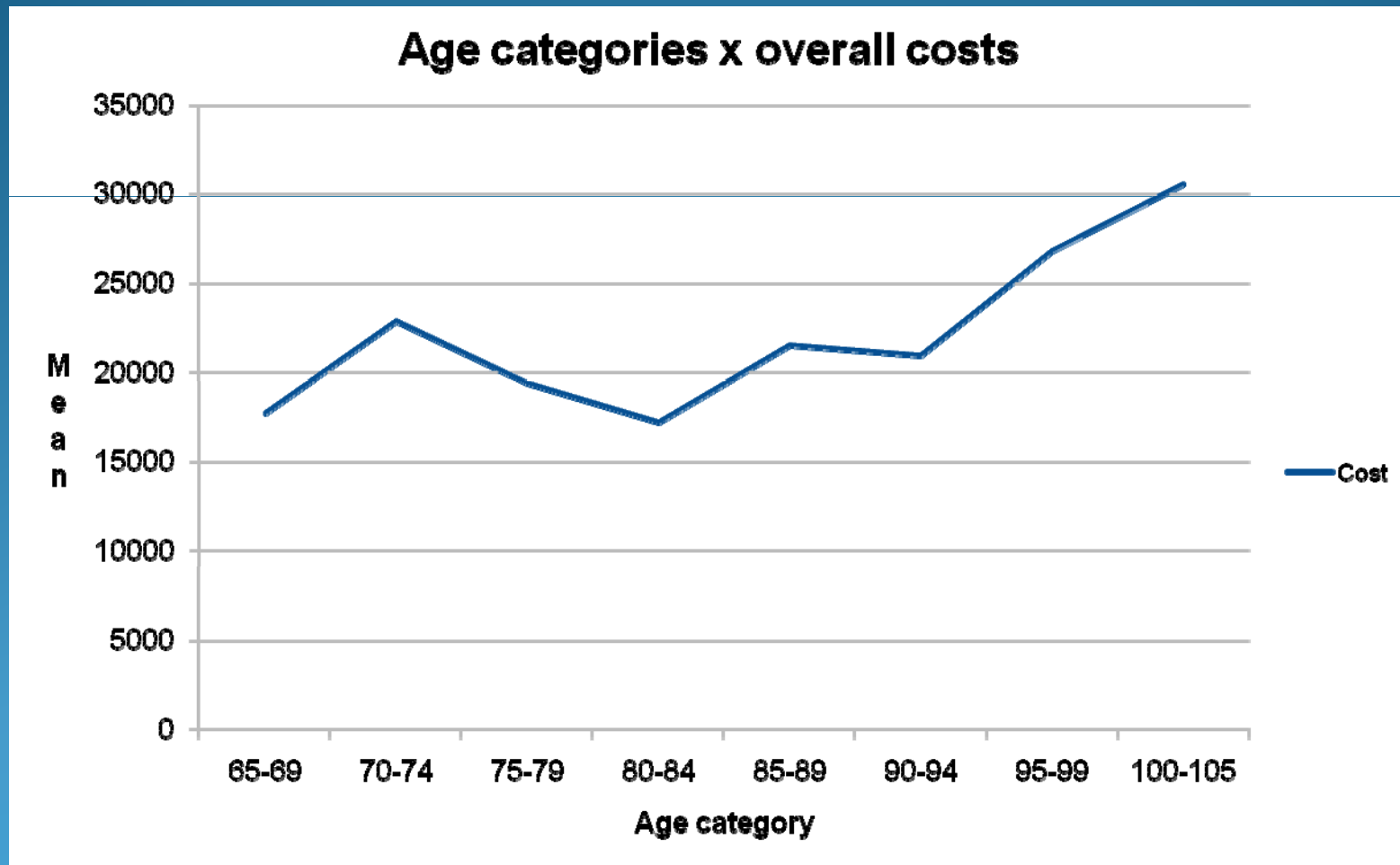


MI diagnoses x ROA

1,235 seniors with mental illness diagnostic codes in total

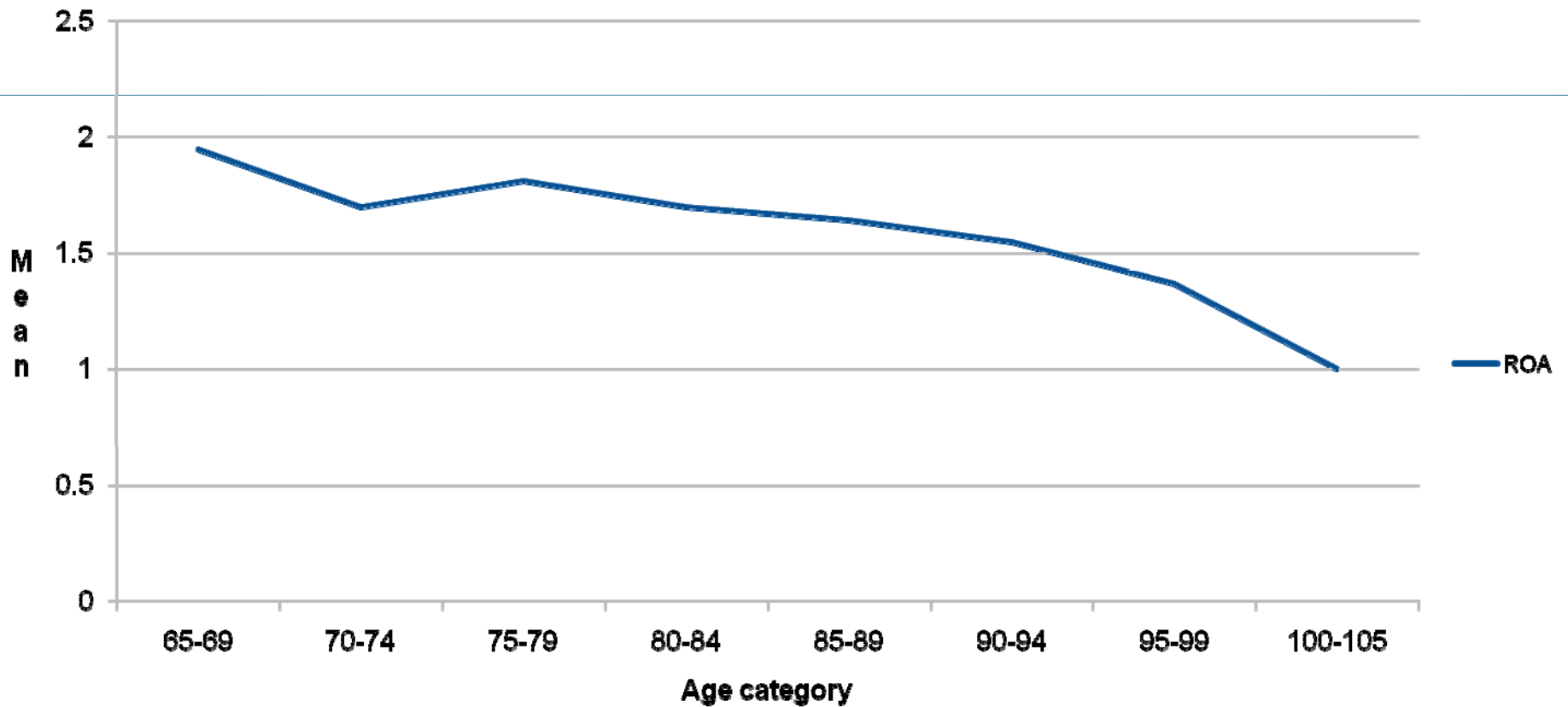
- 86% had only 1 mental illness code
 - 91% had 1 admission
- 12% had two mental illness codes
 - 84% had 1 admission
 - 10% had 2 admissions
- 2% had three mental illness codes
 - 88% had 1 admission

Extra age analysis for cost



Extra age analysis x ROA

Age categories x #admissions



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***