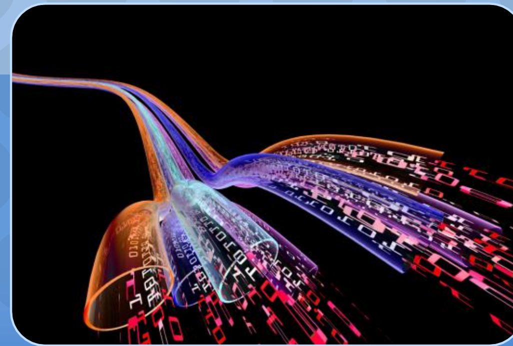
Healthcare Utilization Among Vulnerable Populations

ICare 2011



Vulnerability

- *Vulnerability* is a multidimensional construct with many definitions
- Vulnerable populations experience a convergence of many risk factors (community and individual level)
  - Low income, lack of insurance, age, race, illness

Physically vulnerable groups	**Psychologically vulnerable groups**	**Socially vulnerable groups**
High risk mothers and infants	Mentally ill and disabled	Abusing families
Chronically ill and disabled	Alcohol or substance abusers	Homeless persons
Persons living with HIV/AIDS	Suicide or homicide prone	Immigrants and refugees

Source: Aday, L. At Risk in America : The Health and Health Care Needs of Vulnerable Populations in the United States. 2001

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Vulnerability

- Multiple risk factors result in a higher risk for poor health outcomes.
- Patients with poorer health outcomes place an additional burden on healthcare systems.
- Improved access and utilization of primary care services can decrease the burden on hospital systems, reducing medical costs for high risk individuals.

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Study Objective

- Describe patterns of healthcare utilization among vulnerable sub-groups of a low income, underserved population and identify populations that could benefit from additional intervention to reduce healthcare costs and improve quality of care.

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Integrated Care Collaboration (ICC)

- Non-profit alliance of health care safety-net providers in Central Texas (Austin area)
  - Multi-hospital systems
  - Public and private clinics
  - Federally qualified health centers
  - City public health clinics
- Organized around the medically indigent population of individuals who are uninsured or underinsured
- Maintains a fully operational Health Information Exchange (HIE) system
  - Database called ICare

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ICare HIE Database

- 2011 Available Data
  - Demographics
  - Encounter level data
    - Admission and discharge dates
    - Location/Facility
    - Payor
    - Provider
    - Diagnoses (ICD-9 codes)
    - Procedures

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Inclusion Criteria

- Timeframe: Calendar Year 2011
- ICare patients aged 0-64 years
  - 65+ excluded due to lack of Medicare data in ICare
- Encounter types
  - Clinic/office
  - Emergency department (ED)
  - Inpatient (IP)
  - Outpatient

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Vulnerable Groups

- Near Elderly
  - Age of 60-64 years as of 12/31/2011

- Homeless
  - Most recent address in the ICare recorded as “Homeless” or “No Address” OR
  - Most recent address was associated with an agency that serves the homeless (Salvation Army, Austin Resource Center for the Homeless, etc.)
  - Past addresses are not retained by the ICare system.
    - Patient defined as currently homeless at the time of the data pull may not have been homeless at the time of their encounter.

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Vulnerable Groups

- Behavioral Health
  - Diagnosis of a behavioral health condition at any encounter during 2011
  - Mental illness diagnoses are defined by the Healthcare Costs and Utilization Project (HCUP) Clinical Classifications Software (CCS) for ICD-9-CM[1]
    - Codes related to tobacco use have been excluded as mental illness diagnoses
- Disabled
  - Diagnosis of a condition which may qualify them as having a severe and chronic disability during 2011
  - Disability diagnoses are defined by ICD-9 codes that are described and approved by the Texas Department of Aging and Disability Services (DADS) as a condition which may qualify an individual as having a severe and chronic disability as described in federal and state law[2]

1. http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp
2. http://www.dads.state.tx.us/providers/guidelines/ICD-9-CM_Diagnostic_Codes.pdf

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Methods

- Descriptive statistics to describe population
  - Distribution of vulnerable populations
  - Demographics (race/ethnicity, age, sex)
  - Healthcare utilization (ED and IP visits)

- Poisson regression to quantify risk
  - Risk of an ED visit
  - Risk of an IP visit
  - All risk models are adjusted for all four vulnerable groups as well as age, sex, and race/ethnicity

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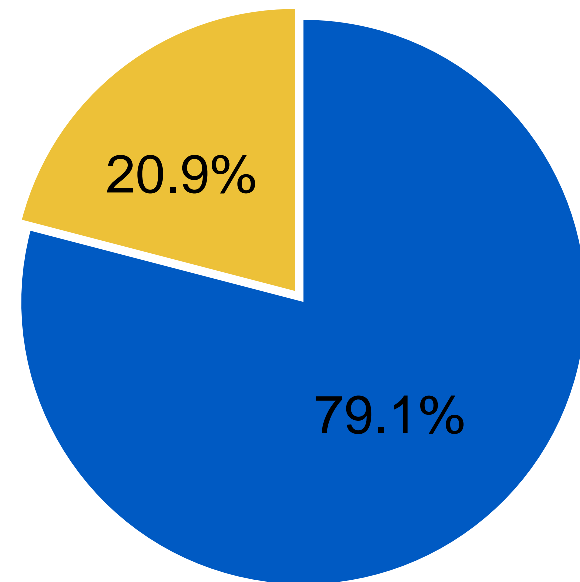
Results

- Total of 279,992 patients aged 0-64 years
- 58,624 (20.9%) of patients were vulnerable
- 221,368 (79.1%) did not fall into a vulnerable population



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Vulnerable Population by Group

Percent of Vulnerable Patients

80
60
40
20
0

Near Elderly	Homeless	Behavioral Health	Disabled
14.5%	4.1%	71.0%	25.1%

*Groups are not mutually exclusive

Vulnerable Group Overlap

Condition	Near Elderly	Homeless	Behavioral Health	Disabled
Near Elderly	**8,512**	106	1,982	961
Homeless	106	**2,401**	1,145	215
Behavioral Health	1,982	1,145	**41,642**	4,758
Disabled	961	215	4,758	**14,689**

1,145 / 2,401 = 0.477

47.7% of Homeless patients also have a Behavioral Health Diagnosis

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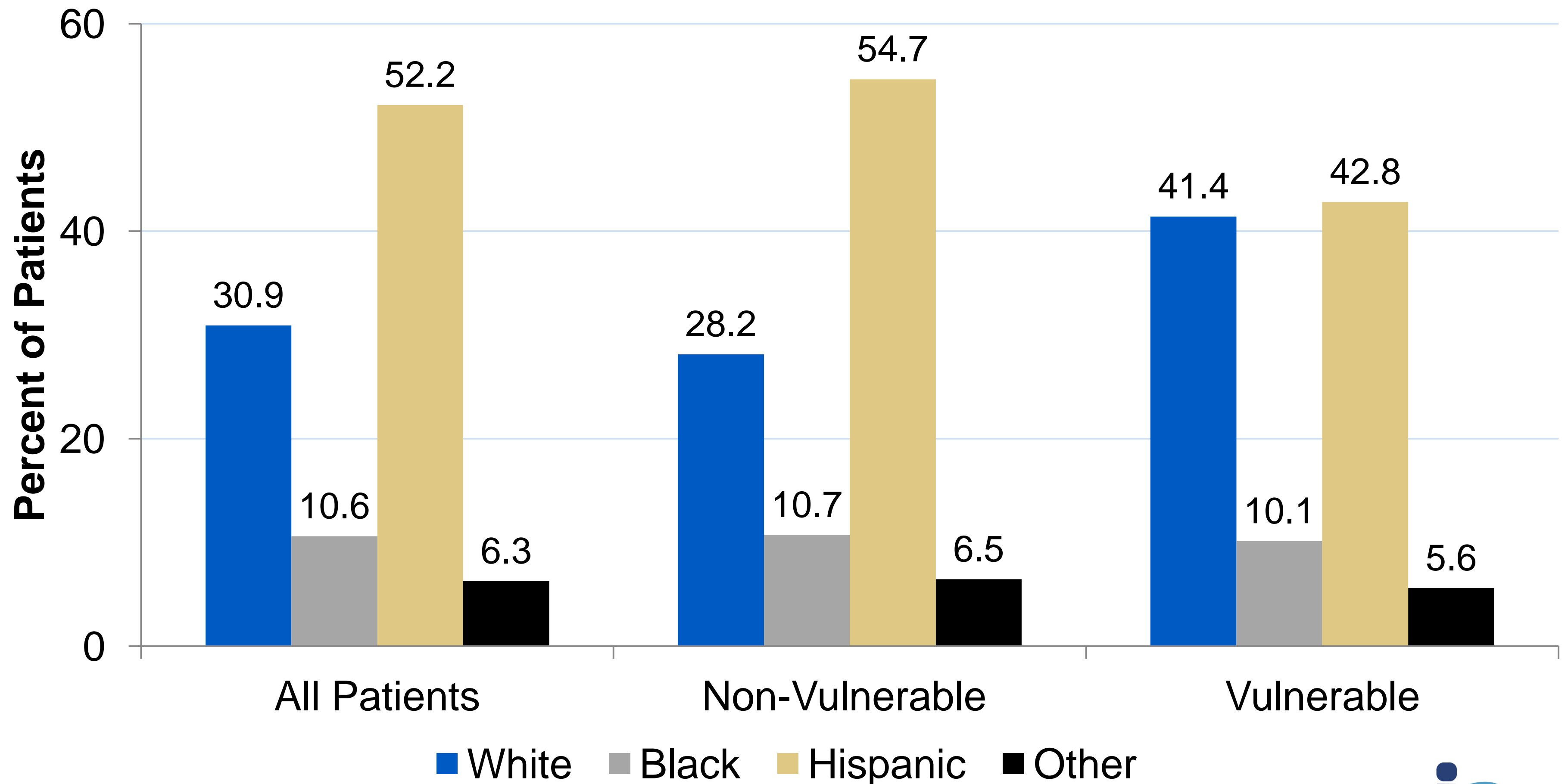
Demographic Distributions



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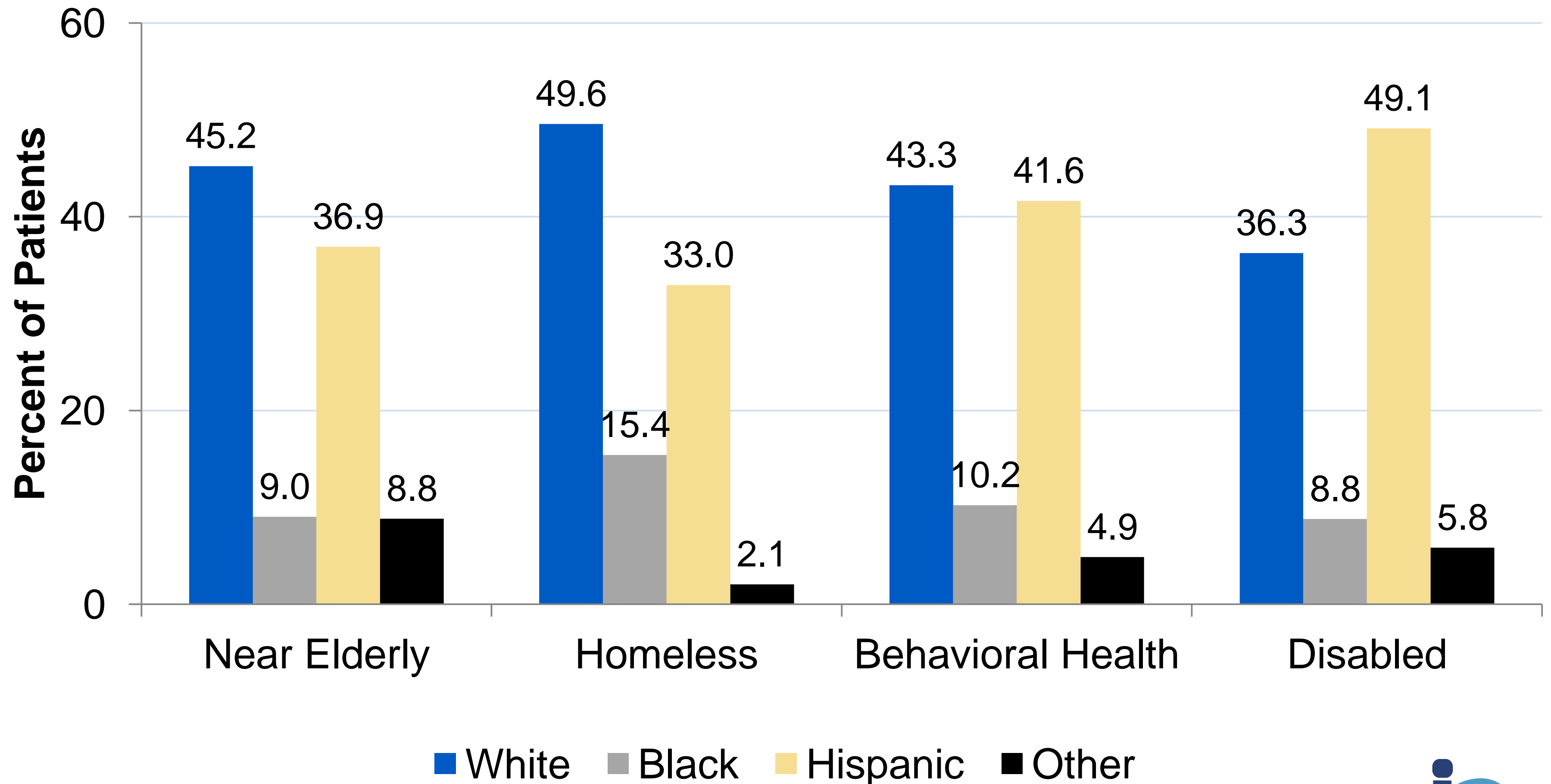

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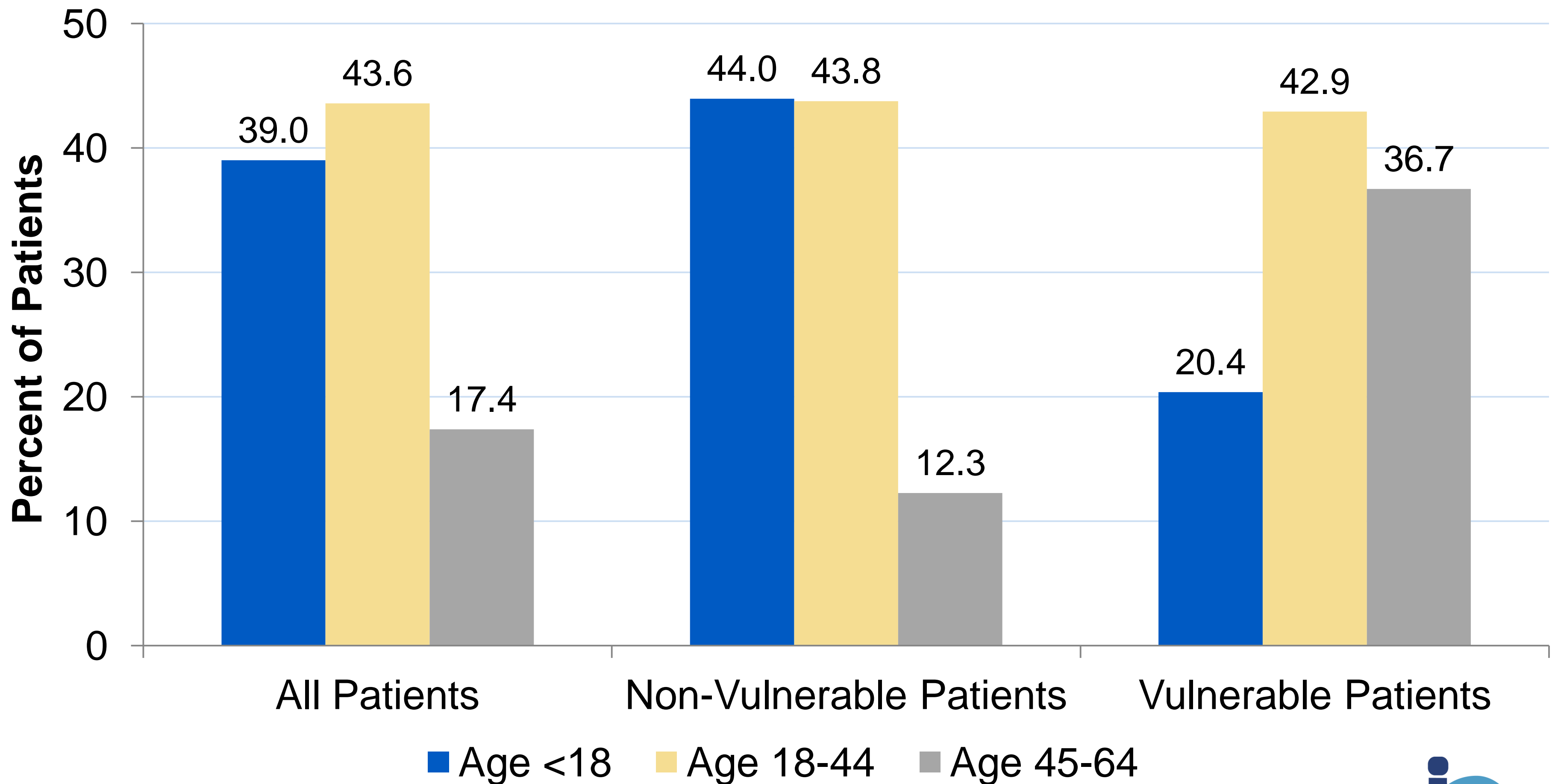
Demographic Distributions



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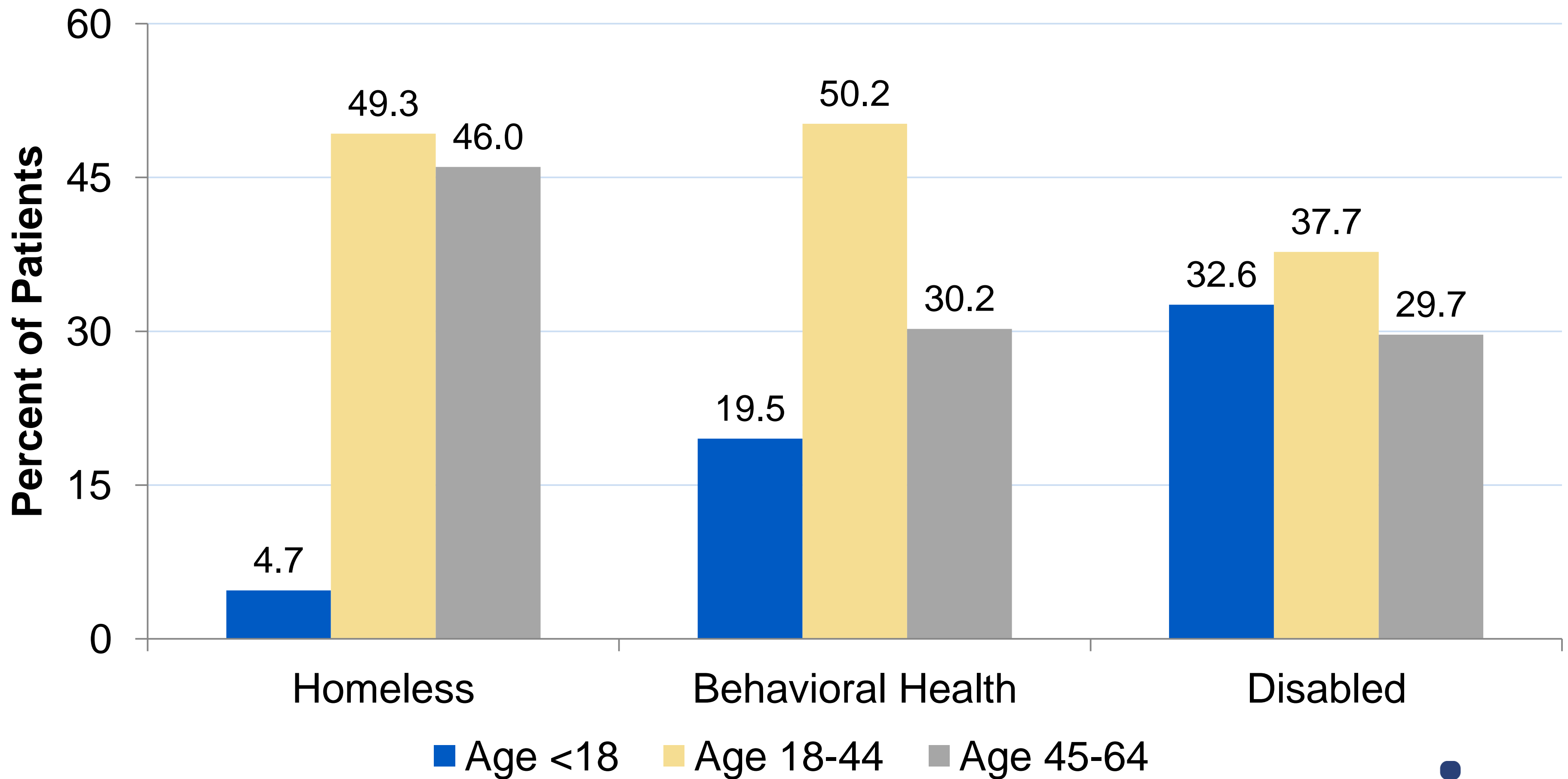

*Near elderly has been omitted from chart, 100% fall into “Age 45-64”.

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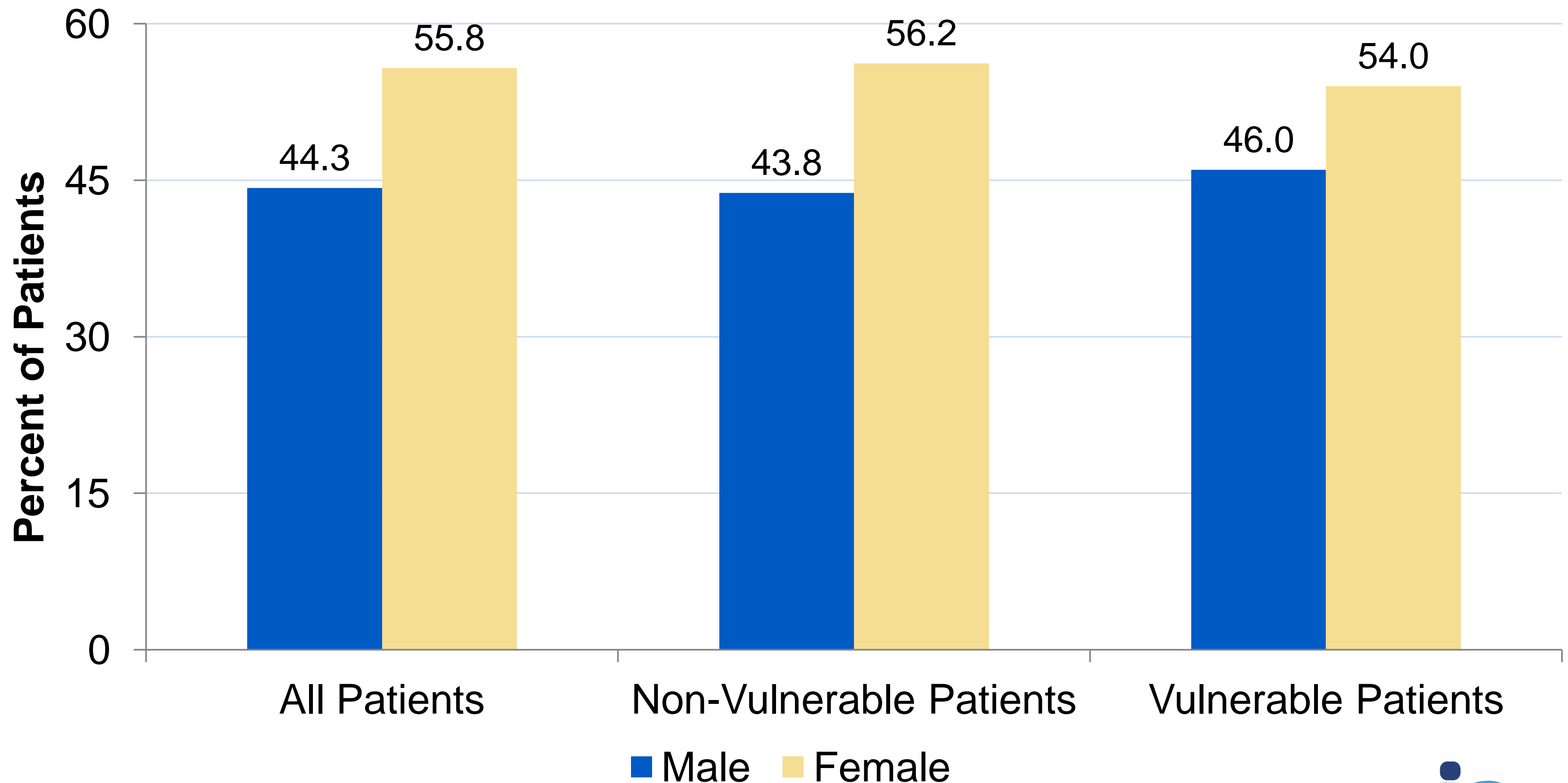
Demographic Distributions



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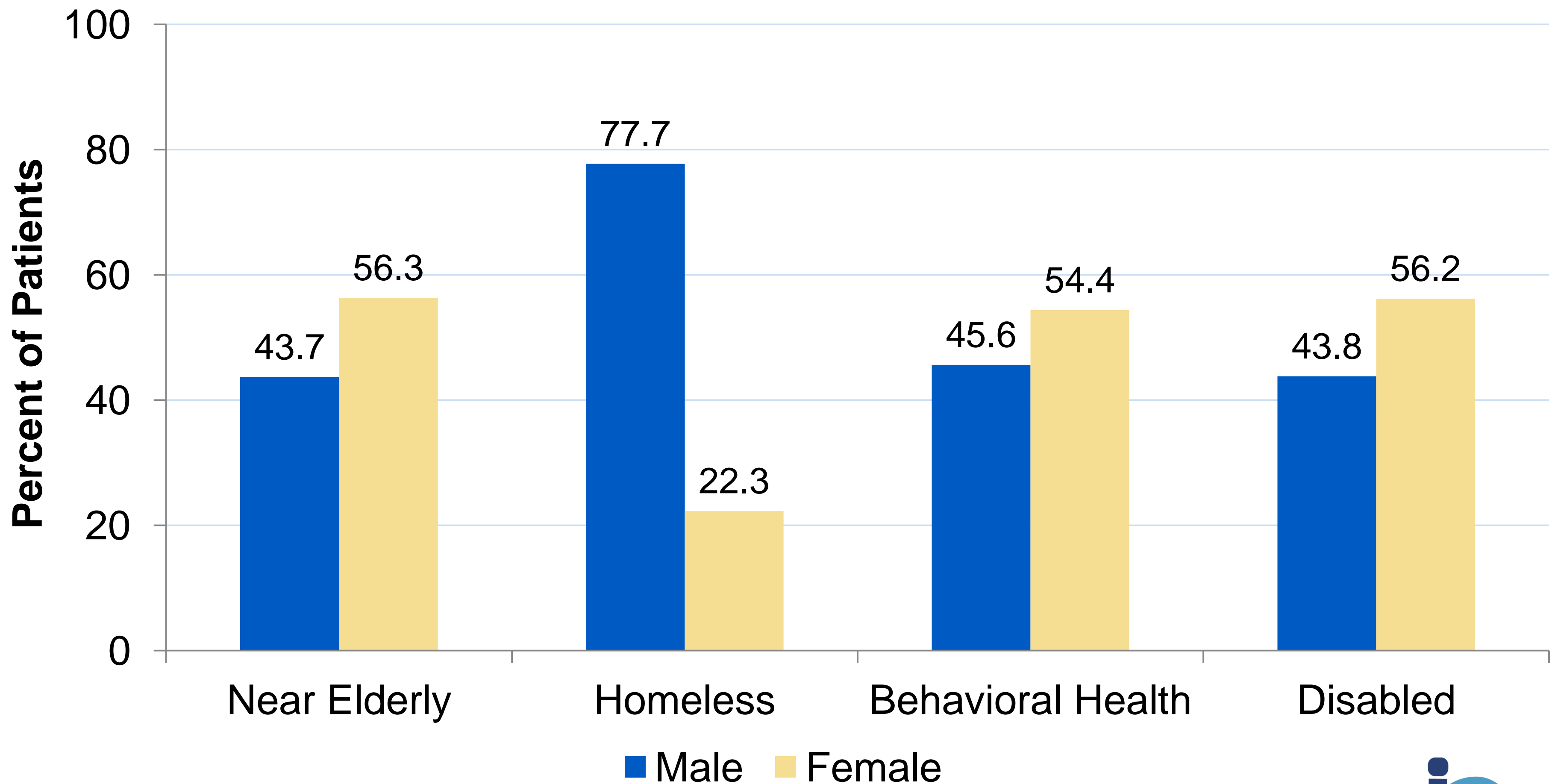
Demographic Distributions



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Demographics Summary

- Race/Ethnicity
  - A higher proportion of vulnerable patients are White and a lower proportion are Hispanic compared to non-vulnerable patients
  - Homeless patients have a higher proportion of White and Black
  - Disabled patients have a higher proportion of Hispanic
- Age
  - Homeless had the lowest proportion of children <18
- Sex
  - Overall, vulnerable patients are distributed similarly to non-vulnerable patients
  - Homeless is the only group where men are more predominant than women

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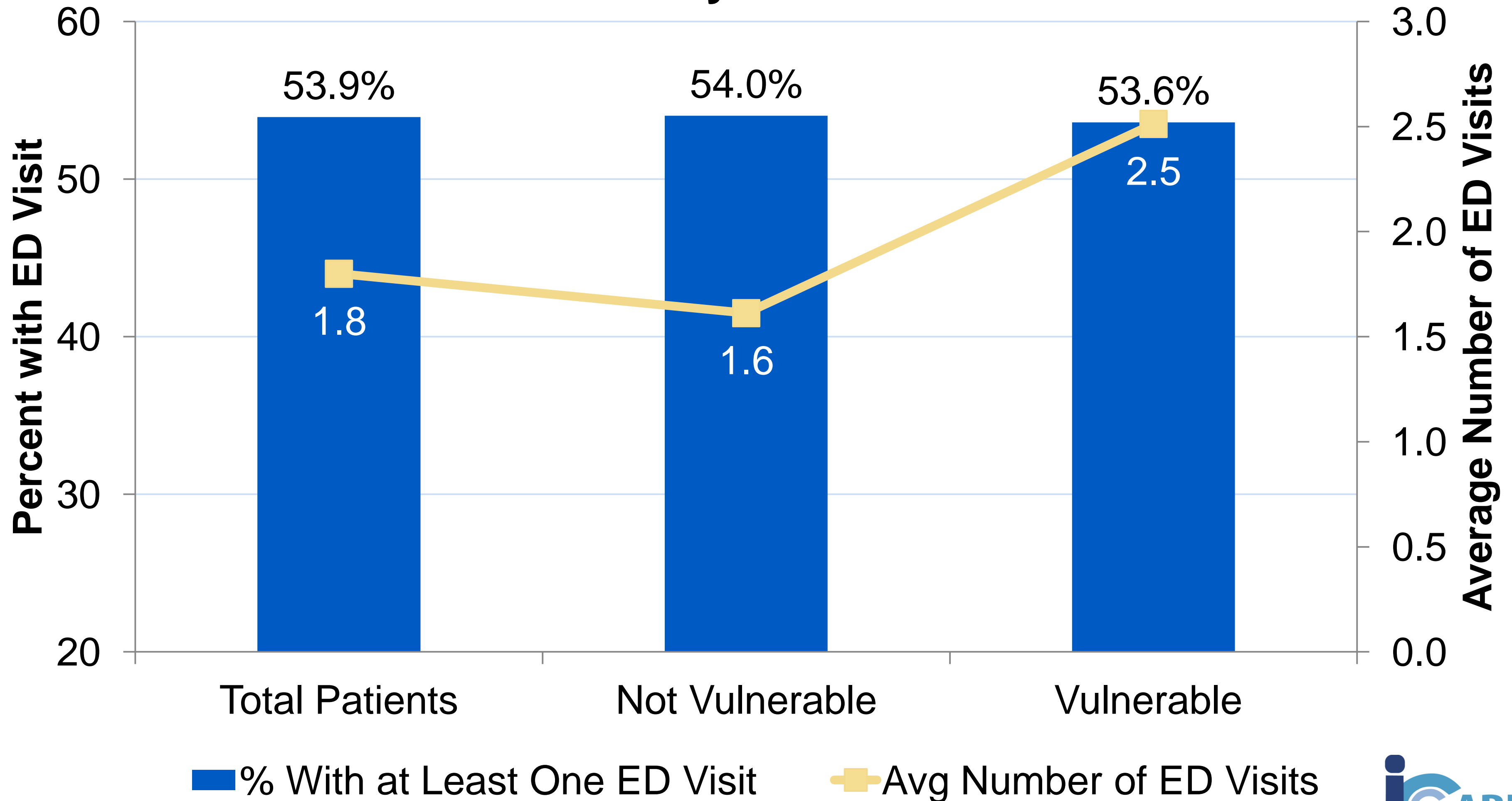
Emergency Department Utilization



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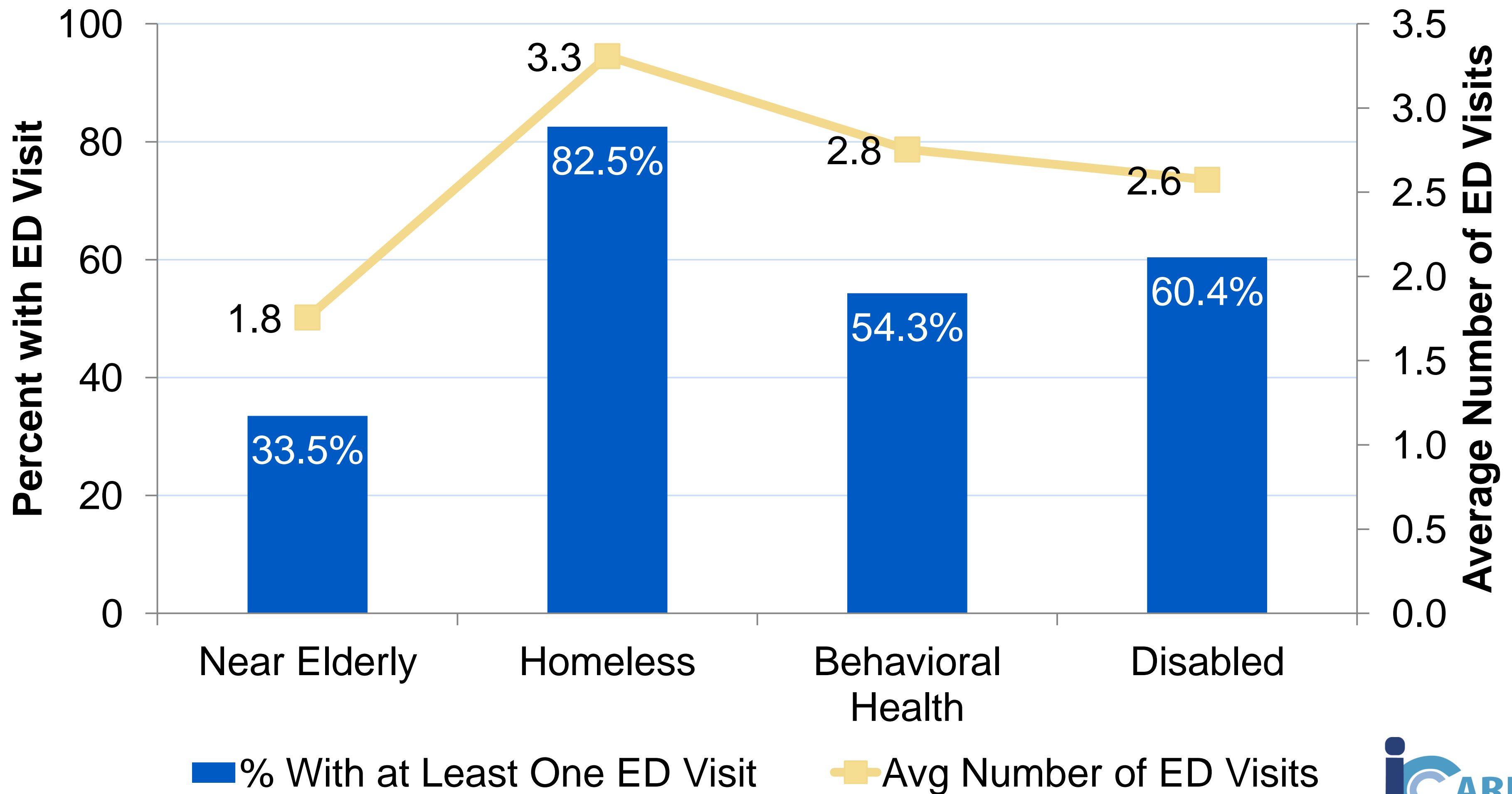

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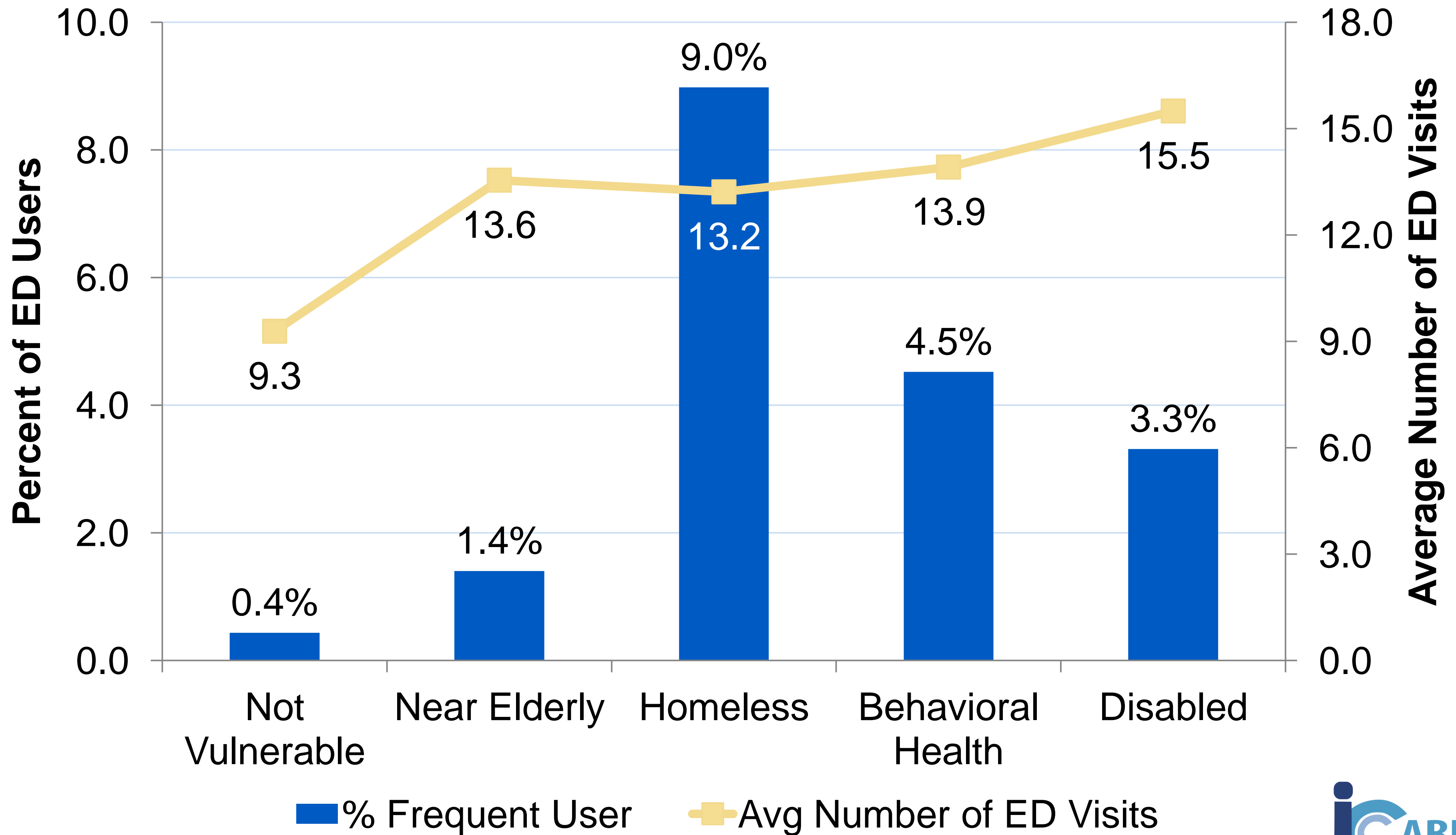
Frequent Emergency Department Users



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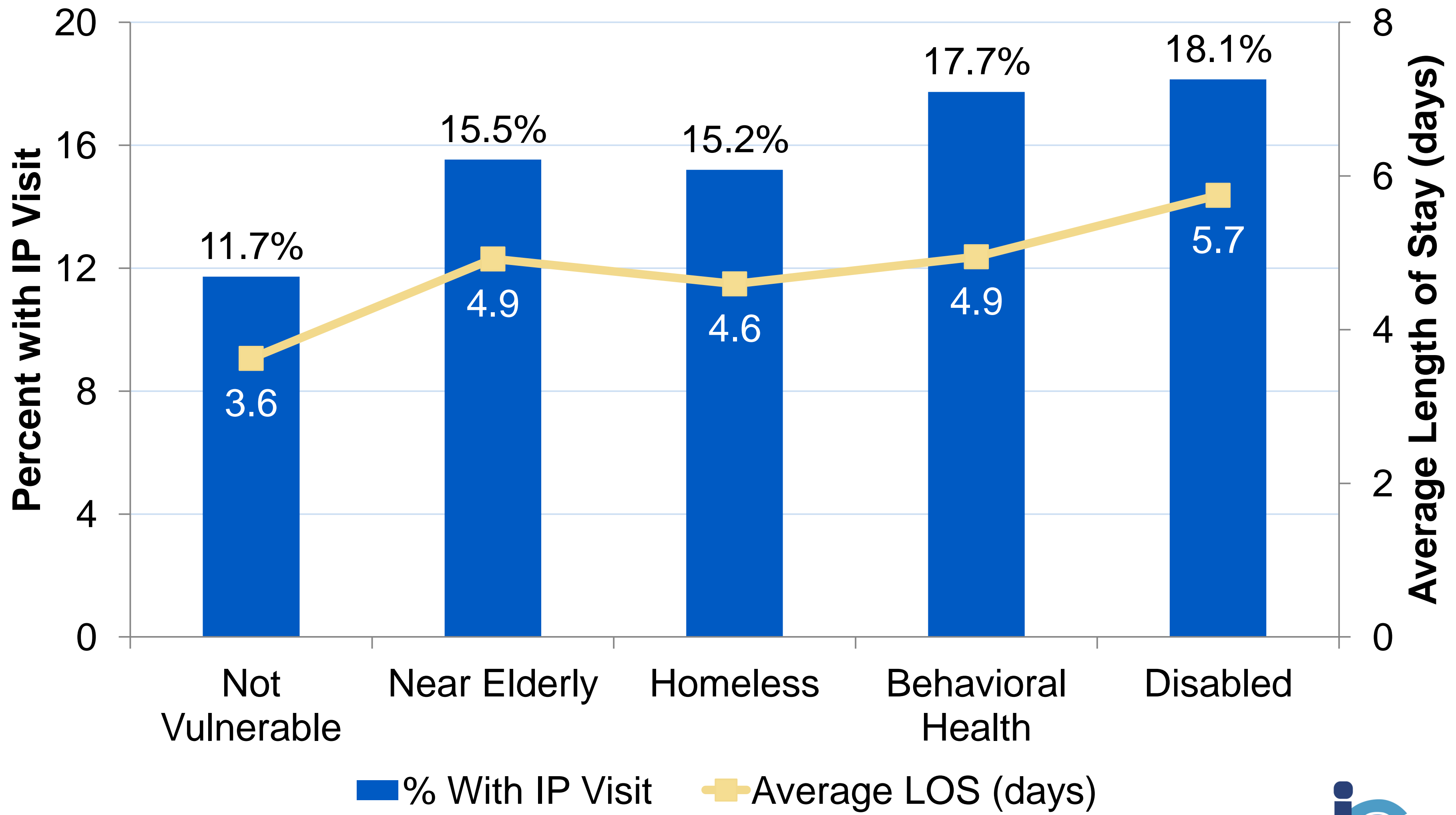
Inpatient Utilization and Length of Stay



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Utilization Summary

- A similar proportion of vulnerable and non-vulnerable patients had at least one ED visit; however, vulnerable ED users had a higher average number of ED visits.
- Homeless patients had the highest rate of ED use and the greatest average number of ED visits among ED users. They also had the highest rate of frequent ED utilization among ED users.
- Near elderly patients had a lower rate of ED utilization than the overall and non-vulnerable populations.
- Disabled patients had the highest rate of IP utilization and the longest average length of stay among IP users. Disabled frequent users had the greatest average number of ED visits.

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Risk of ED Utilization by Vulnerable Group

Group	Risk Ratio (RR)	% Increase	p-Value
Near Elderly	0.67	-50%	<0.001
Homeless	1.48	48%	<0.001
Behavioral Health	1.00	0%	0.994
Disabled	1.12	12%	<0.001

- Near Elderly patients had a 50% lower risk of having an ED visit, compared to patients who were not near elderly.
- Homeless patients had a 48% greater risk and Disabled patients had a 12% greater risk of having an ED visit, compared to patients who were not homeless or disabled, respectively.
- Behavioral Health patients had no change in risk compared to non-Behavioral Health patients.

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Behavioral Health Results

- Result that BH patients had no increased risk of an ED visit was unexpected
  - Further analysis necessary for explanation

- Looked at ED utilization by Behavioral Health sub-group

BH Subgroup	
Adjustment disorders	Mood disorders
Anxiety disorders	Personality disorders
ADHD/Disruptive behavior	Psychotic disorders
Dementia	Alcohol-related
Developmental disorders	Substance-related
Disorders usually diagnosed in childhood	Suicide/intentional injury
Impulse control	Miscellaneous mental disorders

BH Exploratory Analysis

- Utilization quite different by Behavioral Health sub-group

BH Subgroup	% w ED Visit	BH Subgroup	% w ED Visit
Adjustment disorders	47.9	Mood disorders	59.3
Anxiety disorders	57.7	Personality disorders	59.3
ADHD/Disruptive behavior	43.6	Psychotic disorders	68.6
Dementia	61.8	Alcohol-related	74.2
Developmental disorders	63.6	Substance-related	72.1
Disorders usually diagnosed in childhood	39.6	Suicide/intentional injury	90.0
Impulse control	50.6	Miscellaneous mental disorders	66.4

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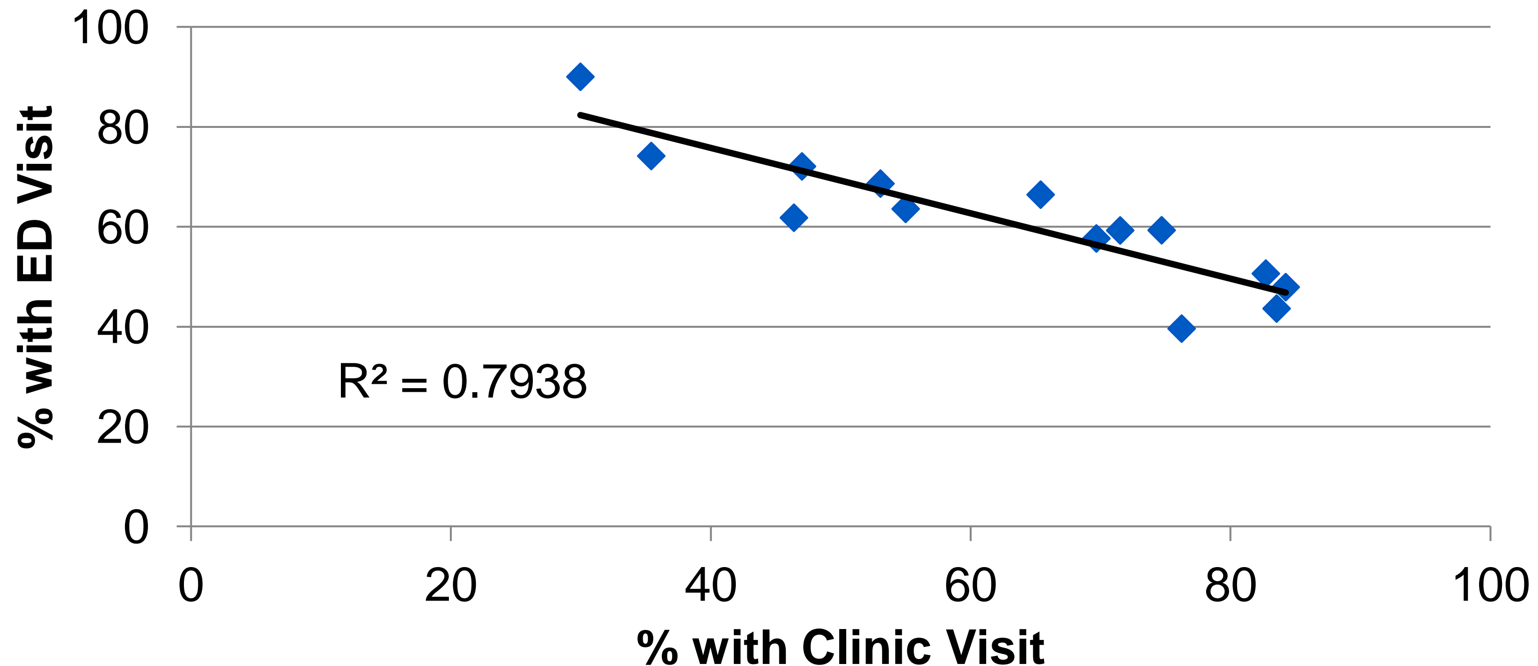
BH Exploratory Analysis

- Looked at correlation between rates of ED utilization and clinic utilization among BH sub-groups
- Groups with high ED utilization had low clinic utilization



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BH Exploratory Analysis

- Re-defined Behavioral Health group to include only the following sub-groups
  - Anxiety disorders
  - Delirium, dementia, amnesic and other cognitive disorders
  - Personality disorders
  - Schizophrenia and other psychotic disorders
  - Alcohol-related disorders
  - Substance-related disorders
  - Suicide and intentional self-inflicted injury

- Re-ran risk analysis using new BH group

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Risk of ED Utilization by Vulnerable Group

	BH Group 1			BH Group 2		
Group	**RR**	**% Increase**	**p-Value**	**RR**	**% Increase**	**p-Value**
Near Elderly	0.67	-50%	<0.001	0.66	-52%	<0.001
Homeless	1.48	48%	<0.001	1.40	40%	<0.001
Behavioral Health	1.00	0%	0.994	1.25	25%	<0.001
Disabled	1.12	12%	<0.001	1.09	9%	<0.001

- Risk of an ED visit remained similar for Near Elderly, Homeless, and Disabled groups
- New group of BH patients have a 25% greater risk of having an ED visit than patients not in group

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Risk of Inpatient Utilization by Vulnerable Group

Group	Risk Ratio (RR)	% Increase	p-Value
Near Elderly	1.10	10%	0.002
Homeless	1.26	26%	<0.001
Behavioral Health	1.89	89%	<0.001
Disabled	1.52	52%	<0.001

- All vulnerable groups had an increased risk of having an inpatient visit

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Risk of IP Utilization by Vulnerable Group

	BH Group 1			BH Group 2		
Group	**RR**	**% Increase**	**p-Value**	**RR**	**% Increase**	**p-Value**
Near Elderly	1.10	10%	0.002	1.12	12%	<0.001
Homeless	1.26	26%	<0.001	1.18	18%	<0.001
Behavioral Health	1.89	89%	<0.001	2.21	121%	<0.001
Disabled	1.52	52%	<0.001	1.56	56%	<0.001

- Risk of an IP visit remained similar for Near Elderly, Homeless, and Disabled groups
- Limited group of BH patients have a 121% greater risk of having an IP visit than patients not in group

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Risk Summary

- Homeless and disabled patients had an increased risk of ED utilization.
- Near elderly patients had a decreased risk of ED utilization.
- Behavioral health patients overall had neither an increased or decreased risk of ED utilization. A limited group of more severe behavioral health patients had an increased risk of ED utilization.
- All vulnerable groups had an increased risk of inpatient utilization.

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Limitations

- Homeless status is only accurate as of last encounter captured in ICare
- Results can only be generalized to patients under age 65
- Study population is limited to patients who are publically insured or uninsured
  - Entire study population may be considered “Vulnerable”.

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Discussion

- Questions?
- Thoughts?

- Email eschiefelbein@lscctx.org for electronic copy

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