A Data-Driven Case for Reverse Integration: Cascadia's Plan for Integrating Primary Care into Behavioral Health Centers

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PRESENTATION OVERVIEW

1. Renee Boak: Overview of Cascadia Behavioral Healthcare, its history, and the evolution of integration

2. Dr. Brian Don: An overview of Cascadia's population-level demographics, and a data-driven case for reverse integration

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CASCADIA'S MISSION AND VISION

Cascadia Behavioral Healthcare delivers whole health care – integrated mental health and addiction services, primary care, and housing – to support our communities and provide hope and recovery for those we serve.

We envision a future where everyone with a mental illness or addiction will receive integrated healthcare, experience well being and have a full life in the community.

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CASCADIA (BEHAVIORAL) HEALTHCARE

18,000 People Served Each Year

Cascadia brings health and housing services to those who need them most. With 75 sites in Oregon's Multnomah, Washington, Clackamas, and Lane Counties, we help create a sense of community.

We've learned that families are an important part of people's lives and offer services unique to children, families, adults, and older adults:

- Community and clinic based services mental health & addiction services

- Forensic mental health

- Homeless services

- Housing

- Medical services- psychiatric and nursing

- Peer wellness

- Residential

- Urgent and emergency services

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BUILDING PRIMARY CARE INTO BEHAVIORAL HEALTH

Cascadia's Building Blocks

- PBHCI Grant

- Peer Wellness

- Data driven decision making

- Chronic Disease Management

- Health and Wellness programming

- Certified Behavioral Healthcare Clinics (CCBHC)

- Executive Team support

CERTIFIED BEHAVIORAL HEALTHCARE CLINICS

Federal Requirements

1. Outpatient primary care screening and monitoring
2. Community based health care for Veterans
3. Targeted case management
4. Peer delivered services
5. Psychiatric rehabilitative services
6. Crisis services
7. Screening, assessment, diagnosis, and risk assessment
8. Outpatient mental health and substance use services
9. Treatment planning

Oregon Requirements

1. Continuous access to behavioral health advice by telephone
2. Routinely offer: screening, assessment and diagnosis (including risk assessment), person-centered treatment planning, outpatient MH services, targeted case management services and psychiatric rehabilitation.
3. On site primary care 20+ hours per week
4. Demonstrate that members of the health care team have defined roles in care coordination for consumers
5. coordinate hospice and palliative care and counseling

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THREE MODELS OF INTEGRATION

PLAZA

- 20 hours primary care

- Largest clinic

- Peer Wellness & Certified Recovery Mentors

- Urgent Walk In clinic

WOODLAND PARK

- 20 hours primary care

- PBCHI grant site & provider

- PBHCI Primary Care Provider

- First site to offer primary are

GARLINGTON

- 20 hours primary care

- Designed to be an integrated care clinic

- Pharmacy

- Lab

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INNOVATIVE MODELS OF CARE BRIDGE HEALTH, HOUSING AND WELLNESS IN ONE LOCATION

Garlington Health Center

Integrated healthcare clinic

Garlington Place

Affordable housing apartment building

Community Wellness and Garden

Promoting healthy living and wellbeing

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WHAT'S DIFFERENT

- Cascadia Primary Care

- 2 Electronic Health Records

- Identified Care Coordinators

- Care pathways

- Huddles

- Warm hand offs

- Intentional opportunities for coordination and consultation

- Population health/health disparities

- Risk Stratification

- Prevention

- Continuity of care

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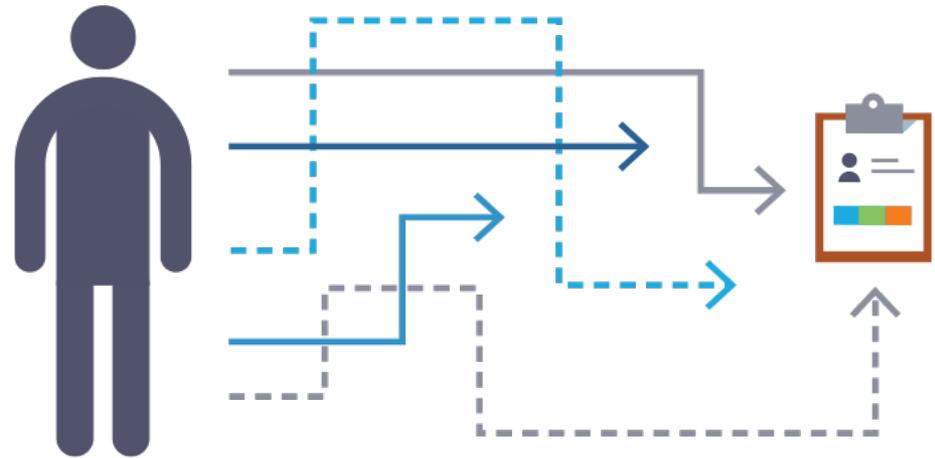
DATA AND METRICS FOR CCBHC

- Case load characteristics

- Access to services (initial evaluation)

- BMI screening and follow up for adults

- BMI for adolescents

- Tobacco screening and follow up

- Alcohol screening and follow up

- Suicide risk assessment

- Depression screening

- Depression remission

- Completed suicides

- Medication reconciliation

- Controlled blood pressure

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LESSONS LEARNED

- Location, and stairs, matter

- Culture change takes time

  - Celebrate successes

  - Identify champions and early adopters

- Access to care needs to be low barrier

- PDSA cycles to determine efficacy of work flow

- Data matters… and know your audience

- Hire providers who are excited to work in behavioral health setting

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Part 2 – A Data-Driven Case for Reverse Integration – Dr. Brian Don

PRESENTATION OVERVIEW

1. Using data to assist with community mental health and the integration of primary care

2. Overview of Cascadia's demographic data

3. Introduction to predictive analyses
   - The link between psychiatric and physical health diagnoses
   - Predicting ED utilization in Cascadia's client population

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WHY EXAMINE THE DATA?

- Lay theories versus evidence

- Programming without validation

- Garnering support from external funding sources

- Creating specific programs to address areas of need, identified based on the data

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CASCADIA'S HISTORY WITH DATA

- I came to Cascadia in the summer of 2017

- Business Intelligence Team – Established January, 2013

  - Responsible for the data warehouse

- Many programs use data in various ways, but not with a coordinated, macro focus

  - Predictive analyses

  - Internal research

  - Population health to drive improvements

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POPULATION HEATH – THE BEGINNING

- Evaluating and merging various data resources

  - Essentia EHR

  - Pre-manage hospitalization data

  - Historical data

- Understanding assessment processes

- Beginning initial work, with an eye on improvement

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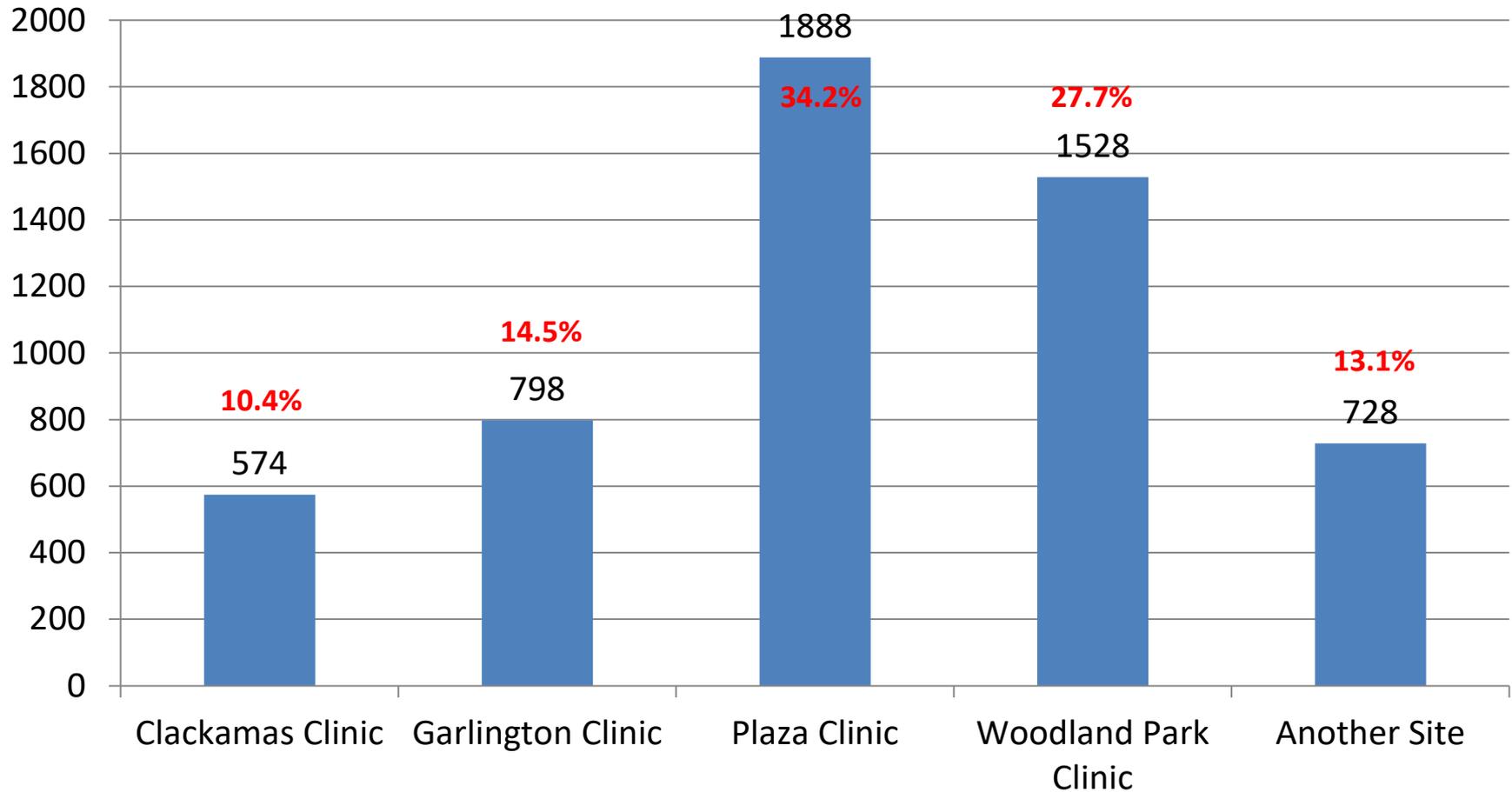# INITIAL POPULATION HEALTH ANALYSES

- Demographic overview of client population

- Understanding ED utilization and inpatient admissions

- Examining the influence of housing status on important outcomes

- Exploring health disparities in gender, race, and socioeconomic status

- Exploring the influence of mental and physical health diagnoses

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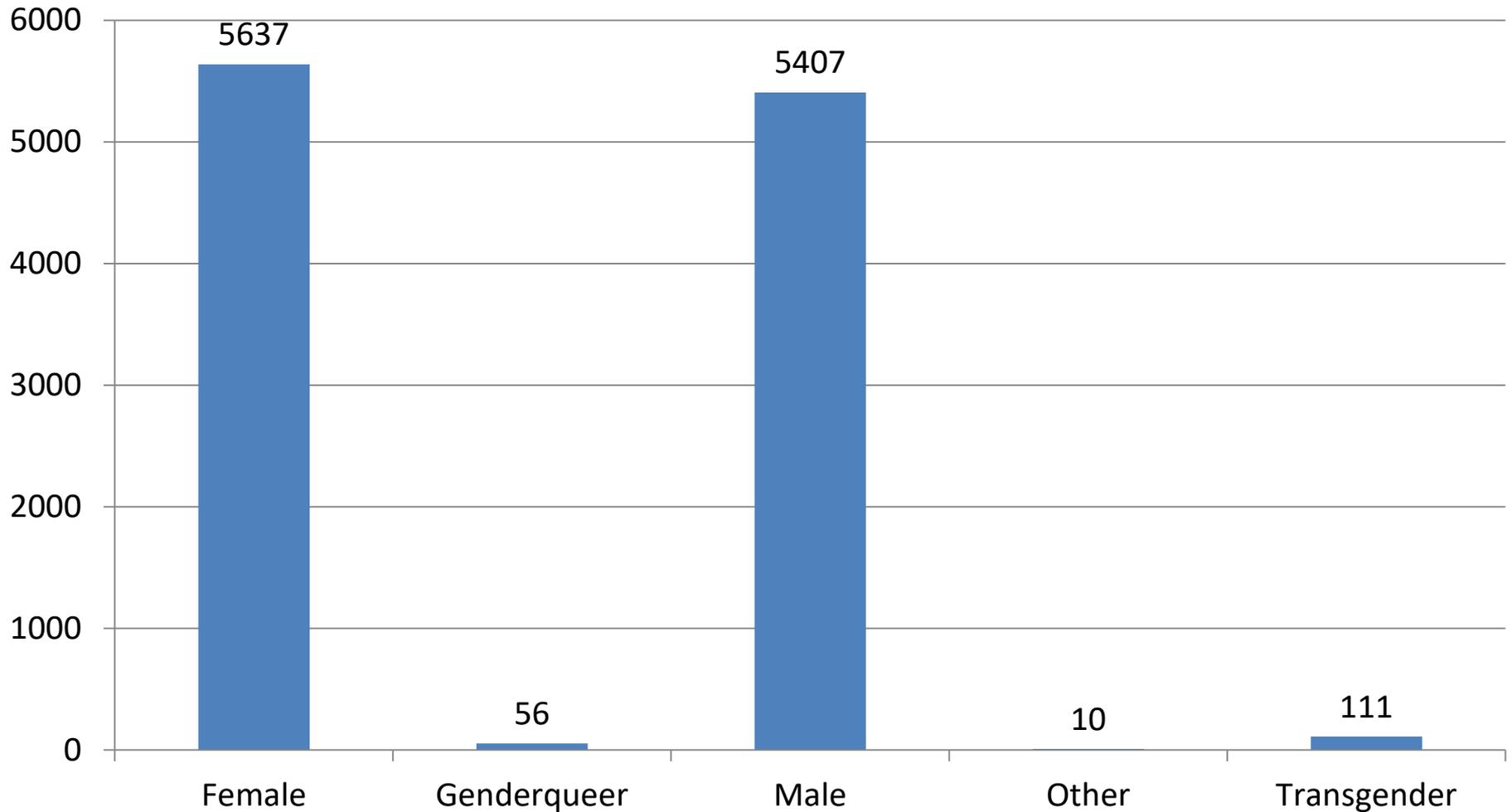# UNDERSTANDING OUR CLIENT POPULATION

- Examined demographics for all active clients during the Fall of 2017

  - Includes 5516 unique individuals

  - Cascadia collects data on the following, among others:

    - Race/ethnicity, gender identity, age, living situation

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PRIMARY LOCATION- ACTIVE CLIENTS- FALL 2017

GENDER IDENTITY- ACTIVE CLIENTS- FALL 2017
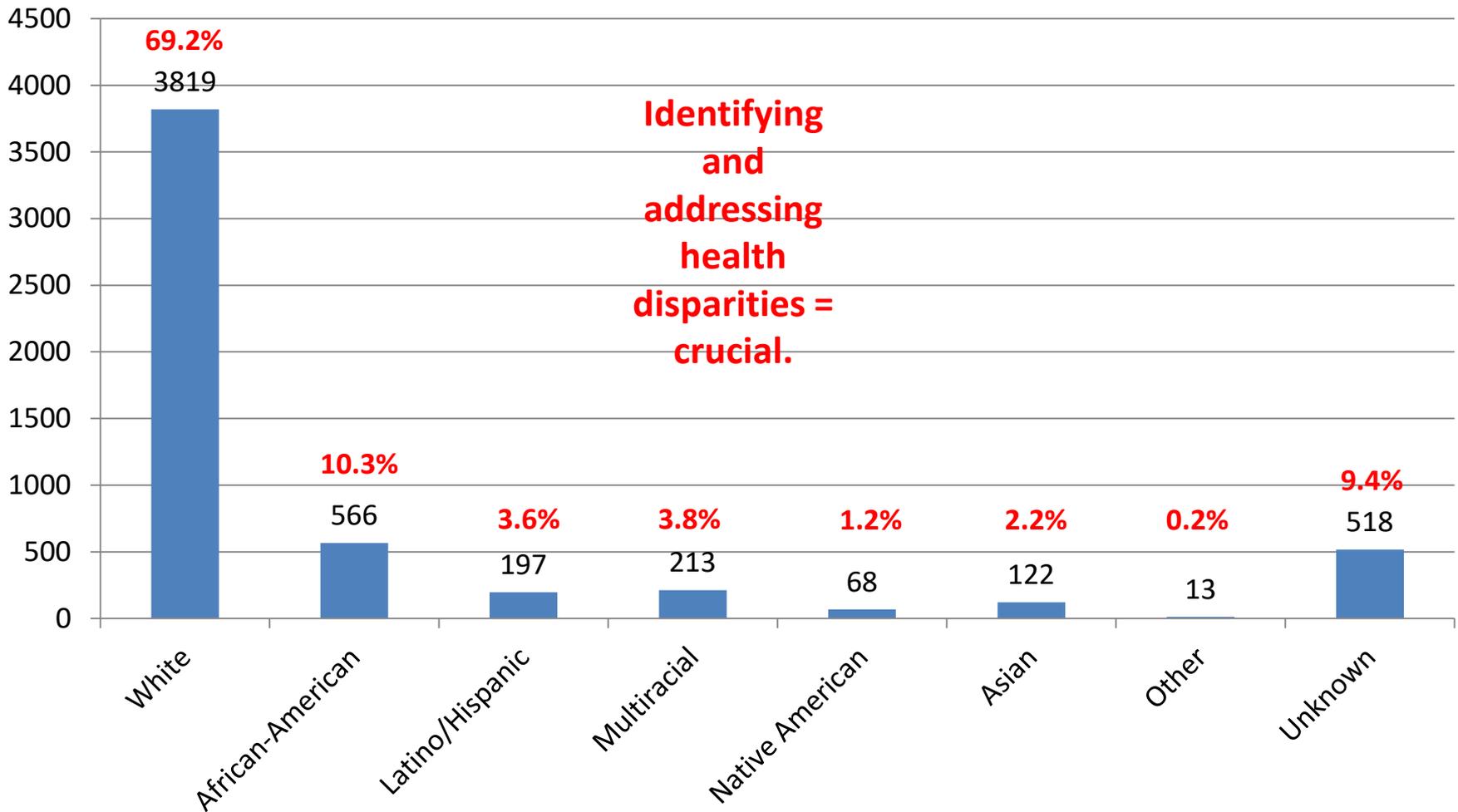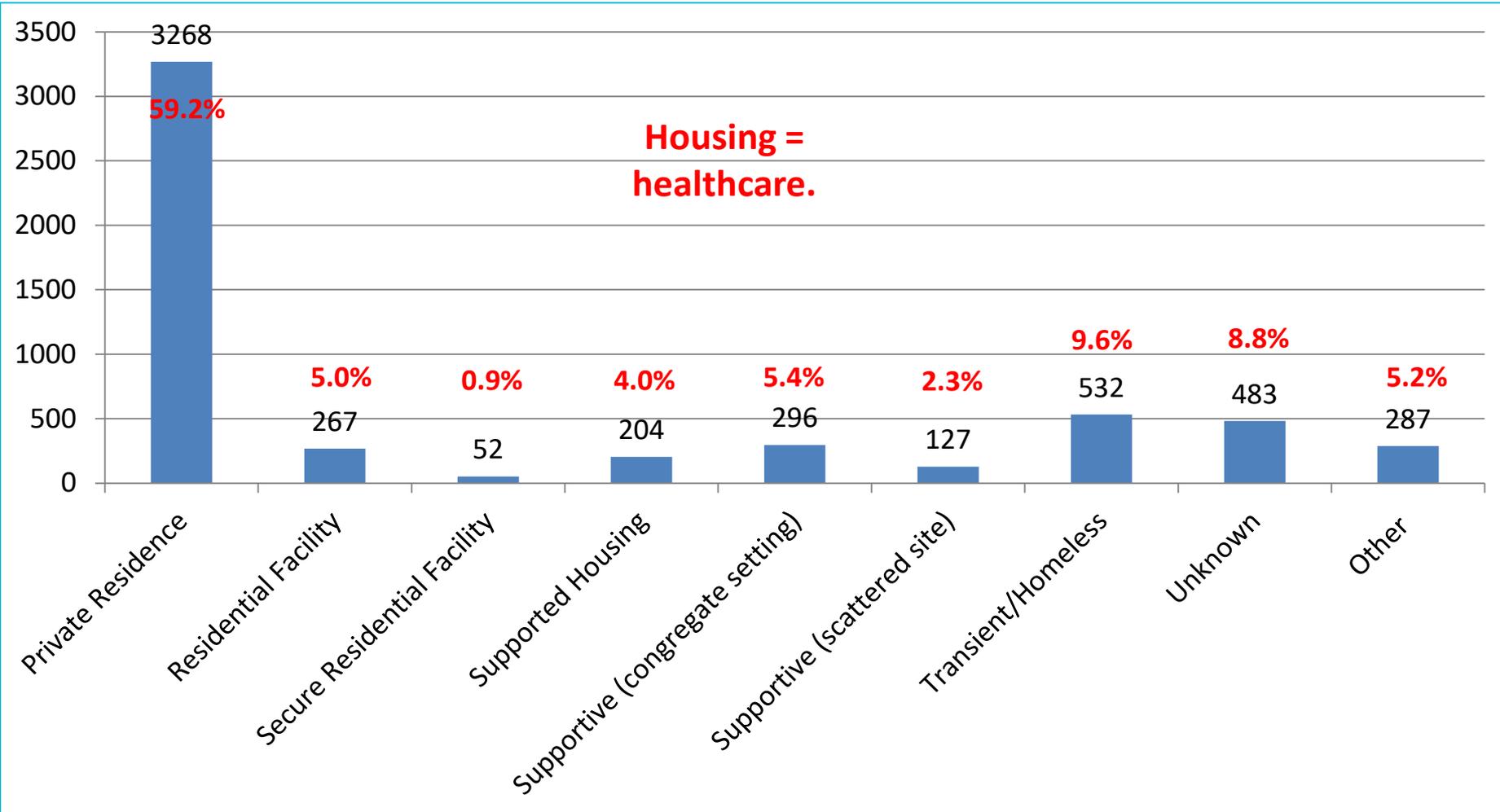
AGE- ALL INDIVIDUALS SERVED- 2016-2017

Important to consider life expectancy.

Bar chart values:
- 0-4: 17
- 5-9: 39
- 10-14: 85
- 15-19: 187
- 20-24: 308
- 25-29: 616
- 30-34: 639
- 35-39: 590
- 40-44: 551
- 45-49: 567
- 50-54: 572
- 55-59: 541
- 60-64: 408
- 65-69: 220
- 70-74: 111
- 75-79: 43
- 80-84: 16
- 85+: 6

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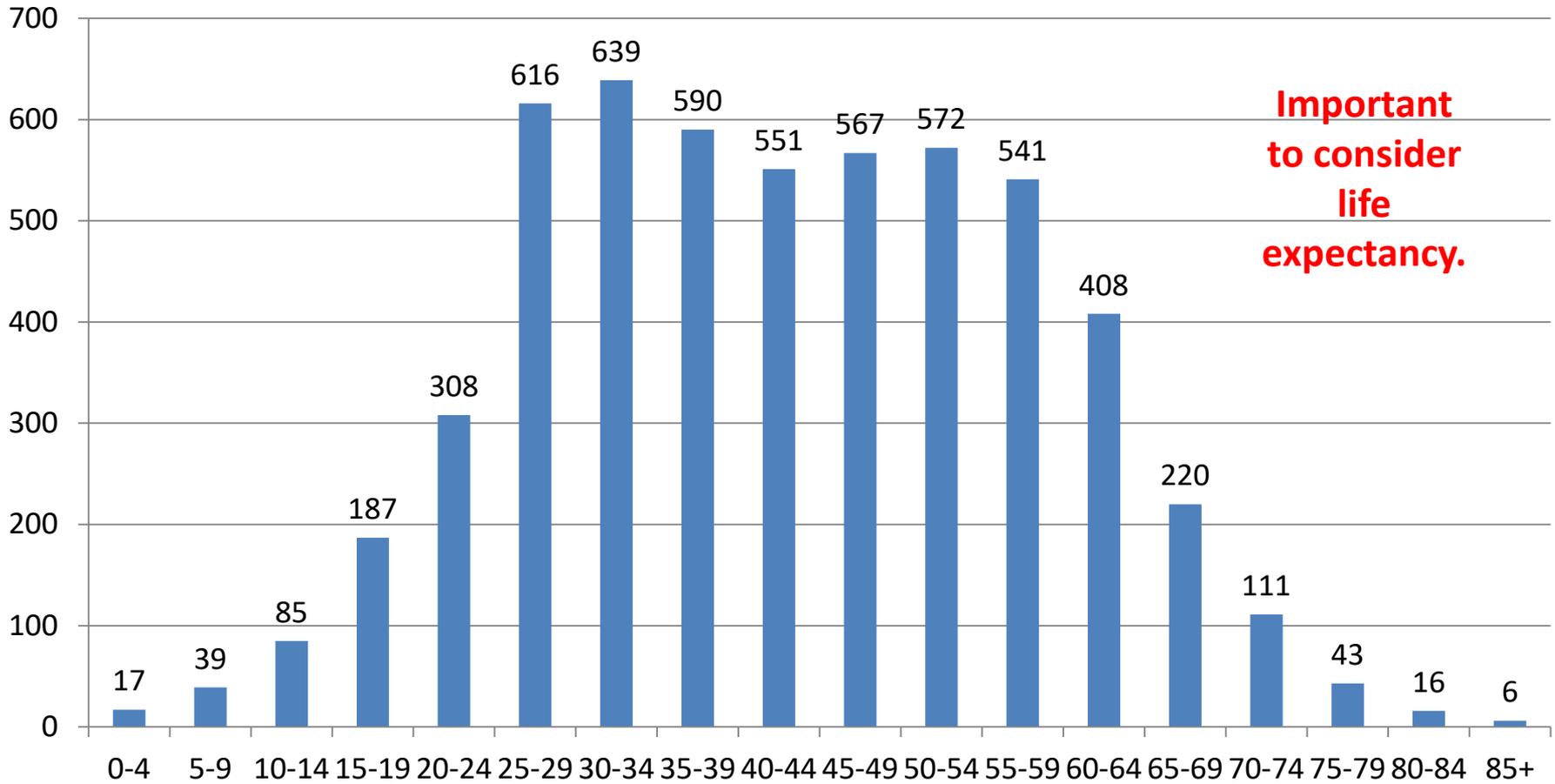
LEVEL OF CARE- ALL INDIVIDUALS SERVED- FALL 2017

Level of Care	Individuals	Percent
ACT	76	1.3%
Level A Child	16	0.2%
Level A Meds Only	30	0.5%
Level A Outpatient	33	0.6%
Level B Child	59	1.1%
Level B Outpatient	368	6.7%
Level B SPMI	707	12.9%
Level C Child	114	2.1%
Level C Outpatient	1768	32.4%
Level C SPMI	1083	19.8%
Level D	306	5.6%

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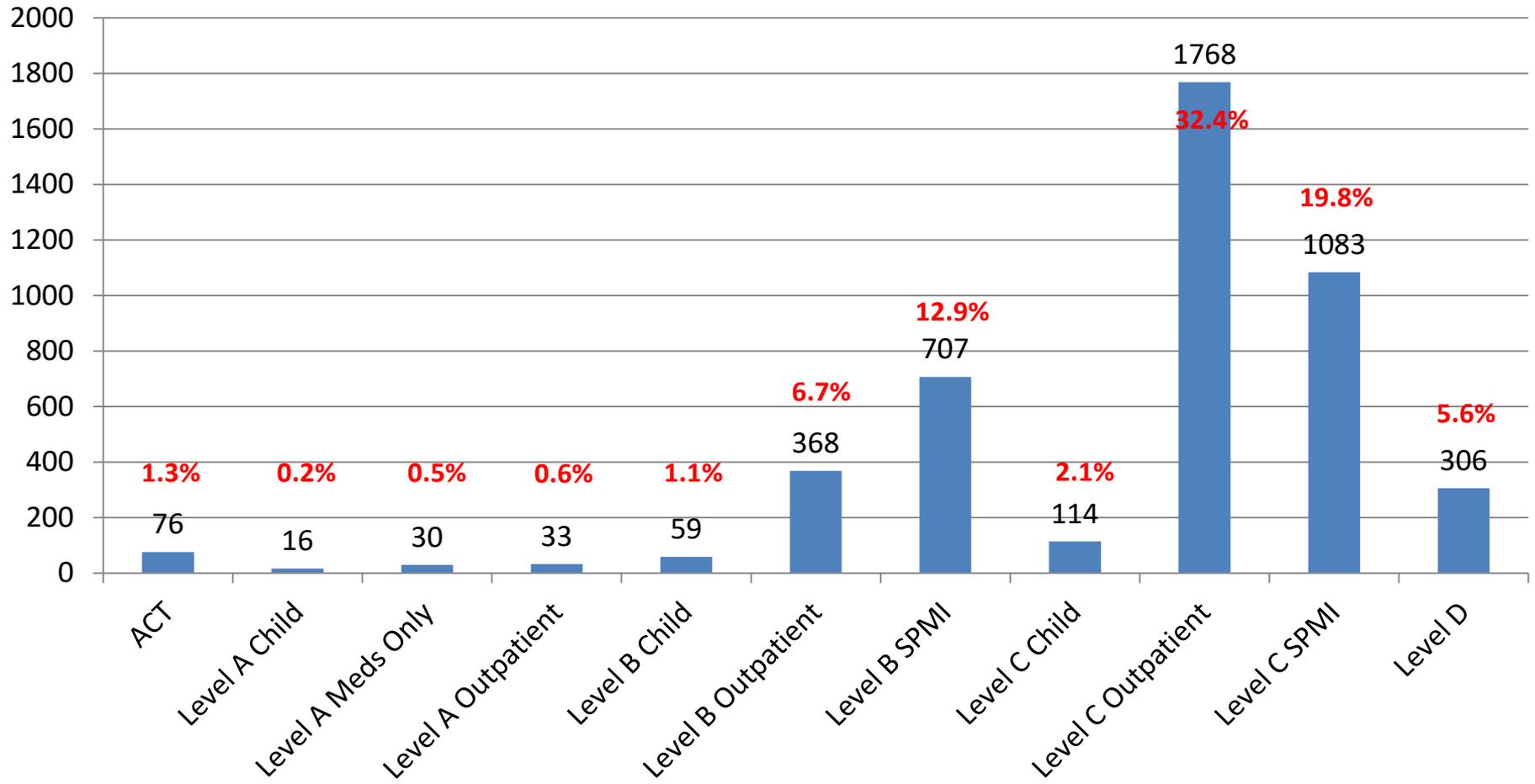
Understanding Psychiatric and Physical Diagnoses in Cascadia's Client Population

The Integration of Mental and Physical Health

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A DATA DRIVEN CASE FOR REVERSE INTEGRATION

- A plethora of research suggests individuals with mental illness have:

  - Higher rates of serious physical health problems

  - Shorter lifespans

  - Greater utilization of costly services

  - Lower engagement in preventative care services

- We strongly believe we can use data and research to improve these problems

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Sources: NIH, SAMHSA, WHO.

MEDICAL AND PSYCHIATRIC CONDITIONS

- An important aspect of Whole Health Care: tracking medical conditions

  - Moreover, mental and physical health conditions tend to be co-morbid, influence each other

  - Important we understand how they contribute to each other and other outcomes

- The data here come from April 1st 2017 until Fall of this year

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FREQUENCY OF PSYCHIATRIC CONDITIONS IN CASCADIA'S POPULATION

Overall *N* = 7434

Many individuals with more than one diagnosis.
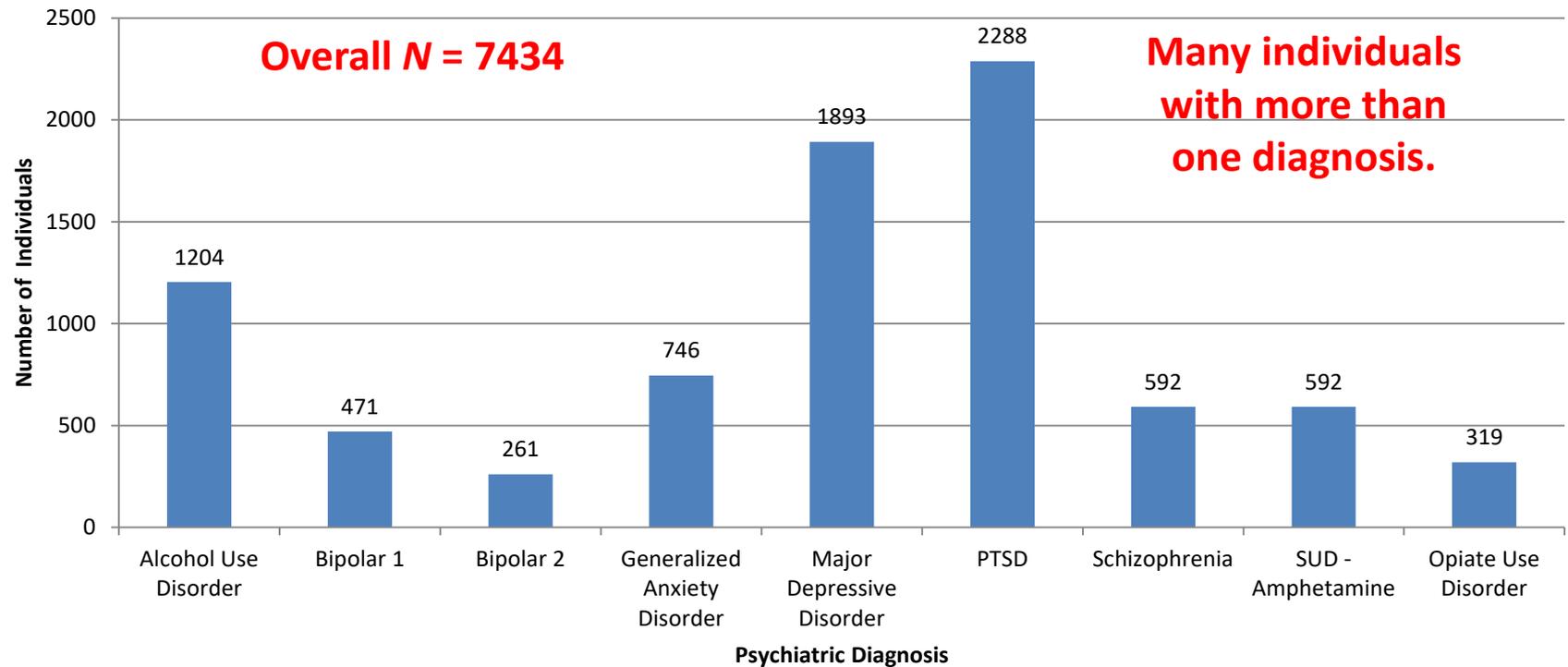
COMORBIDITY OF PSYCHIATRIC CONDITIONS

Of the 2288 people with a diagnosis of PTSD...

33.1% with Major Depressive Disorder

13.2% with Alcohol Use Disorder

8.7% with SUD – Amphetamine

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FREQUENCY OF MEDICAL CONDITIONS IN CASCADIA'S CLIENT POPULATION

Bar chart titled with axis "Number of Individuals" (y-axis) and "Medical Condition" (x-axis):

- Asthma: 1348
- Chronic Pain: 885
- Diabetes II: 855
- Hypertension: 1406
- Obesity: 743
- Overweight: 1321
- CVD: 399
- Cancer: 323

Overall *N* who received this assessment since April 1st, 2017 = 7434

Note: only conditions with greater than 300 individuals are included.

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COMORBIDITY OF MEDICAL CONDITIONS

Of the 1406
people who
report
Hypertension…

30.2% with
Type 2 Diabetes

23.5% with
Obesity

25.9% with
Chronic Pain

25.3 % with
Asthma

11.2% with
Cancer

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MEDICAL AND PSYCHIATRIC CONDITIONS

- Research demonstrates that physical health problems predict mental health challenges, and vice versa

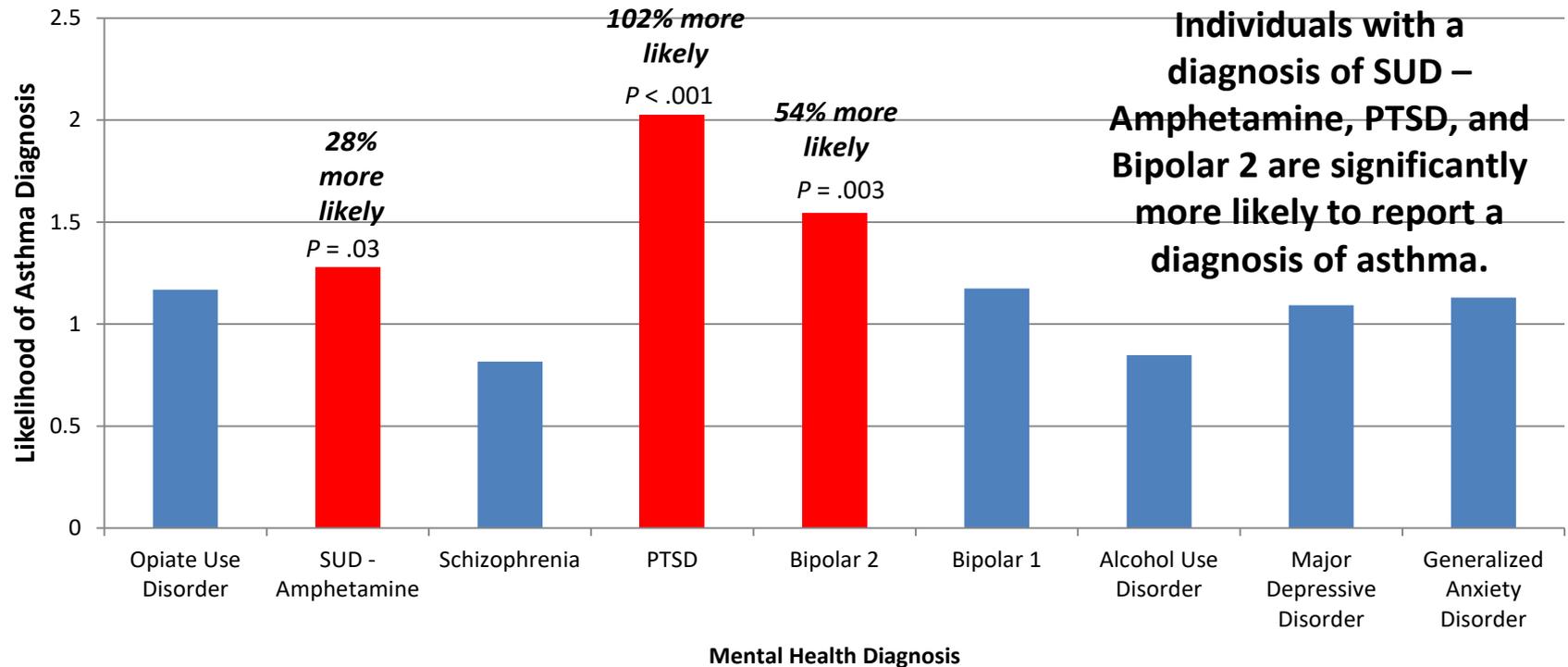- ***Research Question***: *In Cascadia's client population, how are mental health diagnoses associated with physical health outcomes?*

  - Tested using binary logistic regression

  - *Note*: Bi-directionality important to consider

How do mental health diagnoses predict a diagnosis of asthma among Cascadia's clients?

Likelihood of Asthma Diagnosis (y-axis, 0 to 2.5)

Mental Health Diagnosis (x-axis)

Categories: Opiate Use Disorder, SUD - Amphetamine, Schizophrenia, PTSD, Bipolar 2, Bipolar 1, Alcohol Use Disorder, Major Depressive Disorder, Generalized Anxiety Disorder

28% more likely — *P = .03* (SUD - Amphetamine)

102% more likely — *P < .001* (PTSD)

54% more likely — *P = .003* (Bipolar 2)

Individuals with a diagnosis of SUD – Amphetamine, PTSD, and Bipolar 2 are significantly more likely to report a diagnosis of asthma.

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How do mental health diagnoses predict a diagnosis of chronic pain among Cascadia's clients?

Individuals with a diagnosis of PTSD, Bipolar 2 and 1, MDD, and GAD are significantly more likely to report diagnosis of Chronic Pain.

Y-axis: **Likelihood of Chronic Pain Diagnosis** (0, 0.5, 1, 1.5, 2, 2.5)

X-axis: **Mental Health Diagnosis** — Opiate Use Disorder, SUD - Amphetamine, Schizophrenia, PTSD, Bipolar 2, Bipolar 1, Alcohol Use Disorder, Major Depressive Disorder, Generalized Anxiety Disorder

113% more likely $P < .001$ (PTSD)

82% more likely $P < .001$ (Bipolar 2)

127% more likely $P < .001$ (Bipolar 1)

80% more likely $P < .001$ (Major Depressive Disorder)

40% more likely $P < .001$ (Generalized Anxiety Disorder)

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How do mental health diagnoses predict a diagnosis of Type 2 Diabetes among Cascadia's clients?

Likelihood of Type 2 Diabetes Diagnosis (y-axis: 0 to 3)

Individuals with a diagnosis of schizophrenia, PTSD, Bipolar 1, and Major Depressive Disorder are significantly more likely to report diagnosis of Type 2 Diabetes.

149% more likely
P < .001

25% more likely
P = .005

69% more likely
P < .001

27% less likely
P = .01

58% more likely
P < .001

Mental Health Diagnosis (x-axis categories): Opiate Use Disorder, SUD - Amphetamine, Schizophrenia, PTSD, Bipolar 2, Bipolar 1, Alcohol Use Disorder, Major Depressive Disorder, Generalized Anxiety Disorder

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OTHER FINDINGS

- Also examined hypertension, obesity, overweight, CVD, and cancer diagnoses as outcomes

  - **Hypertension:** PTSD (42% more), Bipolar 1 (52%), Major Depressive Disorder (53% more likely)

  - **Obesity**: SUD Amp (42% less), Schizophrenia (121% more), PTSD (56% more), Bipolar 2 (59% more), Bipolar 1 (149% more), AUD (39% less), Major Depressive Disorder (64% more),

  - **Overweight**: Nearly identical, except for alcohol use (not significant), GAD (24% more)

  - **CVD**: Schizophrenia (81% more), PTSD (29% more), Bipolar 1 (96% more), Major depression (101% more)

  - **Cancer**: Depression (50% more), Alcohol (34% less)

MEDICAL AND PSYCHIATRIC CONDITIONS

An individual is diagnosed with PTSD…

…increased risk for Hypertension, Obesity, Overweight, Type 2 Diabetes, Asthma, Chronic Pain

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MEDICAL AND PSYCHIATRIC CONDITIONS

An individual is diagnosed with Major Depressive Disorder…

…increased risk for Cancer, CVD, Chronic Pain, Type 2 Diabetes

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WHAT CAN WE INFER FROM THESE TRENDS

- **There are many possible reasons why physical and mental health problems may be co-morbid**
  - Health problems contribute to depression or anxiety
  - Psychiatric challenges complicate the treatment of health conditions
  - Treatment for a psychiatric problem *creates* physical health challenges (e.g., atypical antipsychotics)
  - Third-variables contribute to both (e.g., unstable housing)

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ADDRESSING THE CHALLENGES

- **What can be done?**

  - Addressing *whole healthcare* needs of the individual is critically important

- For example, an individual with chronic pain:

  - Primary care engagement, mental health, social determinants *all play a role*

    - Cascadia is uniquely suited to address these needs

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Part 2: Understanding Emergency Room Visits Among Cascadia's Client Population

THE COST OF ER VISITS

- Keeping patients out of the hospital is an important priority for our healthcare system

  - Costlier and less effective than prevention

  - Identifying those at risk for frequent ER usage is imperative

- **Goal:** Identify risk factors for frequency of ER visits (and inpatient admissions) across 1 year period (from 4/1/2016 to 3/31/2017)

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PRE-MANAGE DATABASE

- Tracked using pre-manage

  - Info on when and where a client has been hospitalized

  - Different metric than HSO, but they are highly correlated

- Majority of admits were emergency (85.4%)

  - Others included inpatient surgical (5.6%), behavioral health (1.9%), and internal medicine (0.6%)

  - Data on reasons for admit is inconsistent and very messy

    - We are working to improve this

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DESCRIPTIVE STATISTICS

- From 4/1/2016 to 3/31/2017, 2653 individuals were identified as having an ER visit in the pre-manage system

  - M = 3.04, SD = 4.24, Range = 1 − 65

  - 55.6% of individuals had more than 1 ER visit

  - Data is highly positively skewed

  - Certain categories excluded due to small sample size (e.g., Level A Child n = 15)

HISTOGRAM – ED VISIT DATA
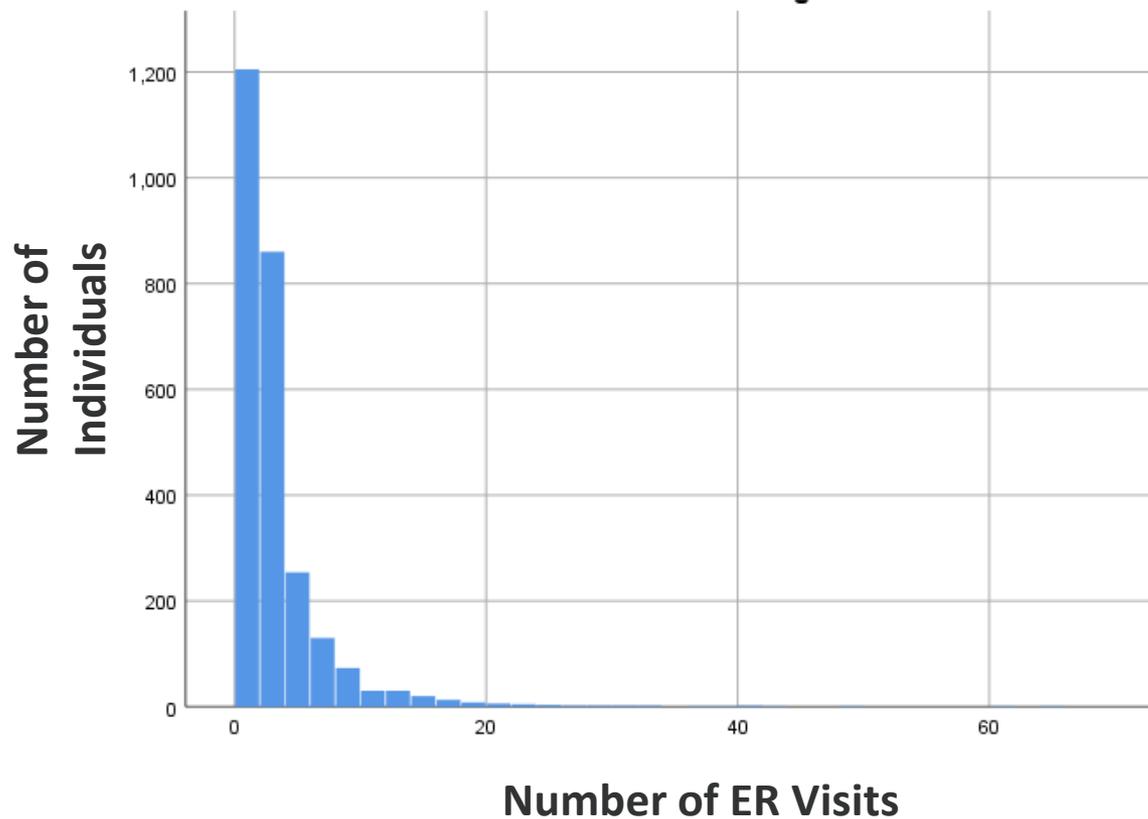
The data is highly skewed.

16.4% of people accounted for 48.13% of ED visits.

OVERVIEW OF ANALYSES

- **Research question**: Can we predict frequency of visiting the ER, using factors like…

  - Gender

  - Age

  - Race/ethnicity

  - Education Level

  - Housing Status

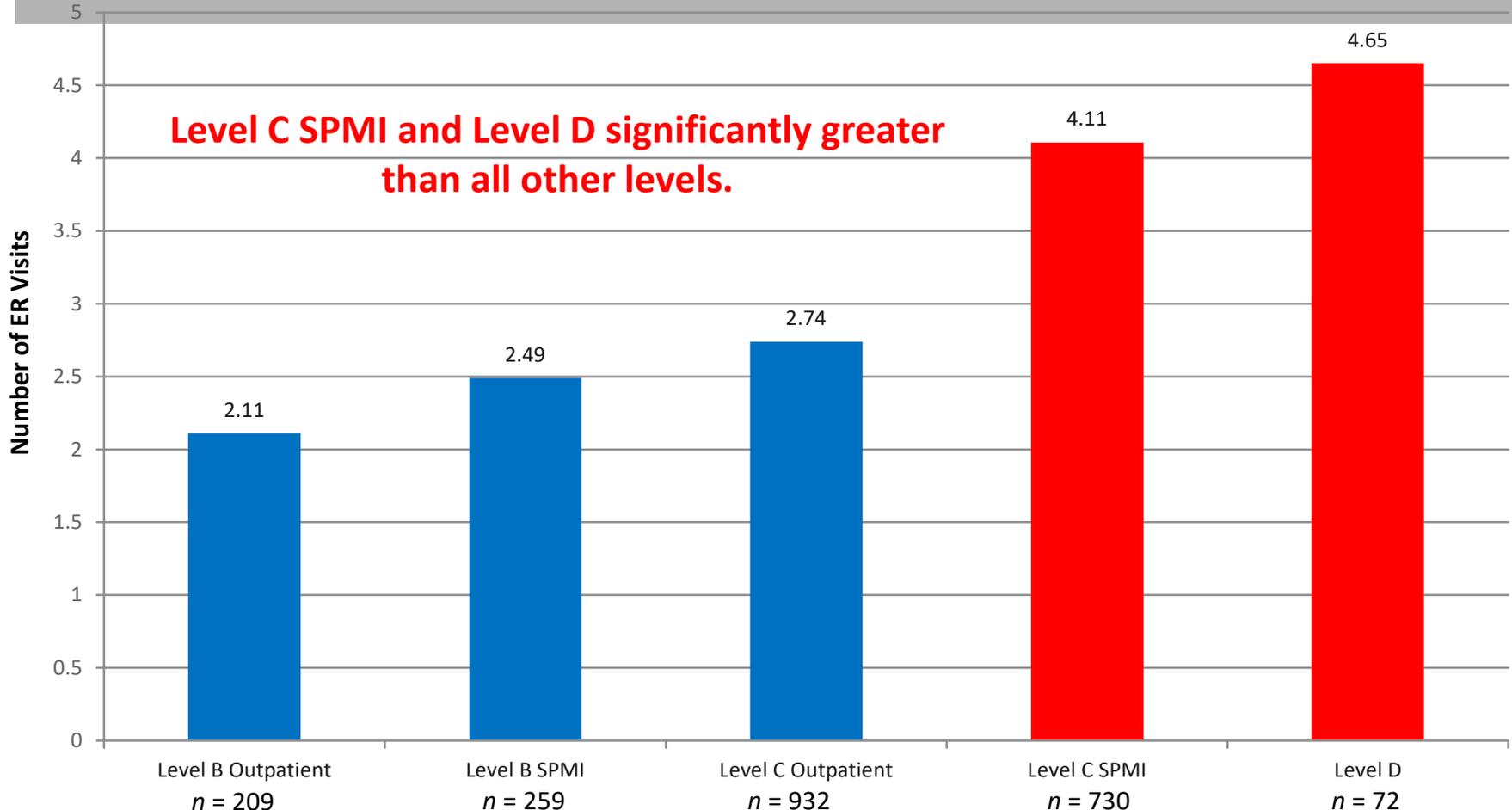 - Level of Care

  - Medical diagnoses

OVERVIEW OF ANALYSES

- Analyses were conducted using ANOVA and multiple regression
  - When significant, demonstrates that there is a relationship between the variable of interest and frequency of visiting the ER
  - Replicated using bootstrapping to account for outliers and skew

- I also attempted to replicate all analyses using data from subsequent year
  - Replication very important to rule out spurious findings

WHAT WAS SIGNIFICANT?

- Age, education, gender identity, racial/ethnic identity, primary site, and sexual orientation did not consistently predict frequency of visiting the ER (all p's < .05, partial η^2 all below .001)

- Even when controlling for the above variables, living situation, and level of care and chronic pain significantly predicted ER visits
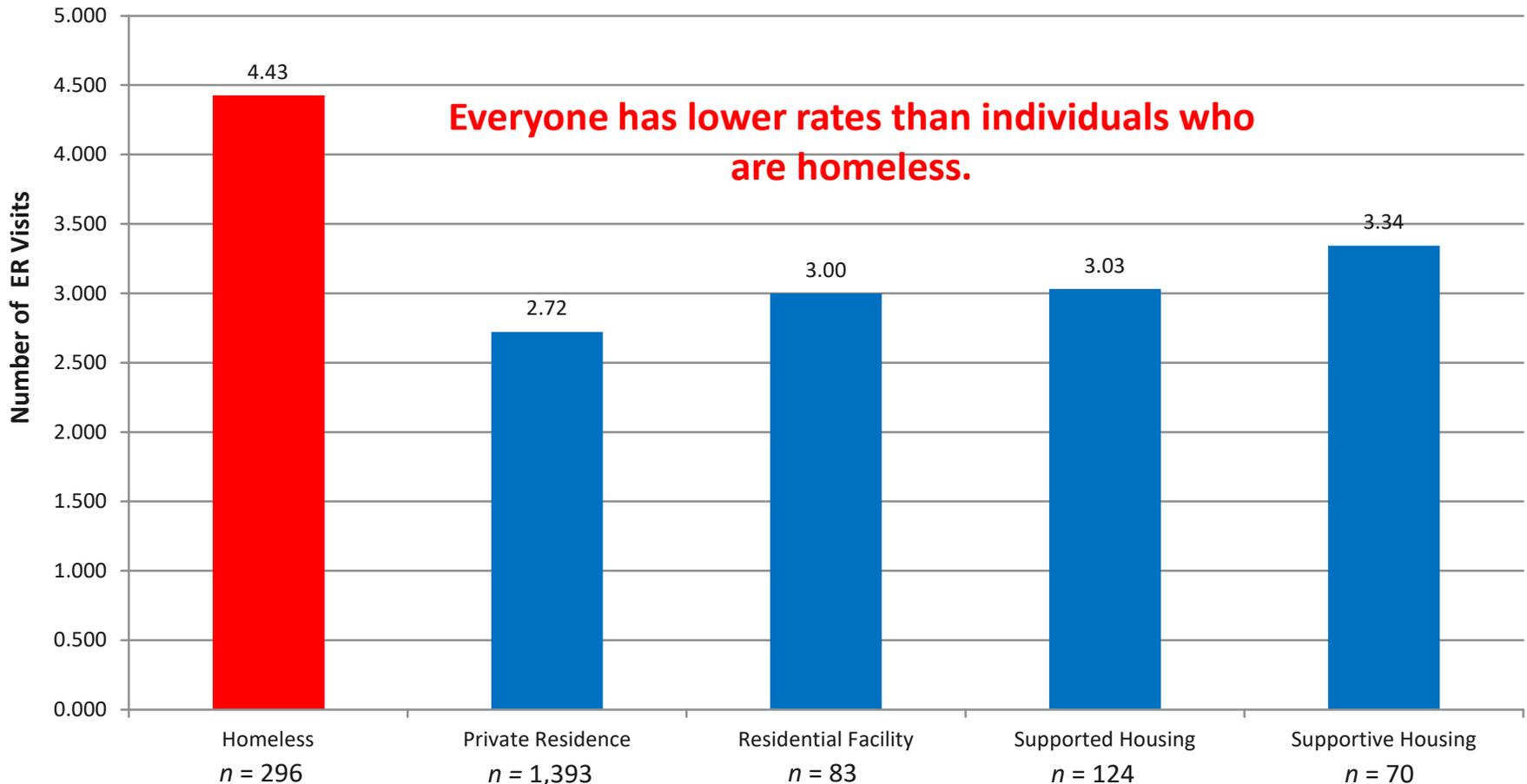
LEVEL OF CARE

Level C SPMI and Level D significantly greater than all other levels.

Number of ER Visits

Level B Outpatient $n = 209$	Level B SPMI $n = 259$	Level C Outpatient $n = 932$	Level C SPMI $n = 730$	Level D $n = 72$
2.11	2.49	2.74	4.11	4.65

$F (4, 1961) = 11.37, p < .001, \eta^2 = .02$

No effect for inpatient admissions.

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ER VISITS BY HOUSING STATUS

Everyone has lower rates than individuals who are homeless.

Number of ER Visits

Homeless	Private Residence	Residential Facility	Supported Housing	Supportive Housing
4.43	2.72	3.00	3.03	3.34
n = 296	*n* = 1,393	*n* = 83	*n* = 124	*n* = 70

$F(4, 2197) = 19.09$, $p < .001$, $\eta^2 = .04$

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Physical Health Diagnoses and Risk in ER Visits

Conclusions

- ER visits are predictable, and tend to fluctuate based on certain risk factors

  - We should be paying particular attention to **homeless clients**, **high levels of care**, and individuals with a diagnosis of **chronic pain**

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This is only Step 1

- **Step 1:** Identify population level patterns, concerns, and correlations

- **Step 2**: Validate (longitudinally, with other data), replicate, and continue to explore

- **Step 3**: Develop *carefully selected* evidenced-based pilot programs to address the need
  - E.g., A data-driven program to assist those in chronic pain

- **Step 4**: Assess, validate, and adjust programming. If effective, scale.

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ADDRESSING THESE ISSUES

- Integration of primary care = ability address many of these concerns

  - Primary care recruitment being targeted based on the data

- Homeless, high level of care, individuals with chronic pain can be targeted for primary care, individual therapy, group therapy, care coordination, etc.

  - **Whole Healthcare Needs**

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Conclusion

We look forward to serving individuals who struggle from mental and physical health challenges. Thank you for your time.