How Vulnerable is the Homeless Population to COVID-19? Results from a National Study

August 18, 2020
House Keeping

- Because this is a webinar, attendees are muted
- Please type any questions you have into the Questions Box
- We are recording this webinar and will send out the link to everyone who registered at a later date.
Speakers

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HUD’s Office of Special Needs Assistance Programs
Health care conditions and health services utilization of individuals experiencing homelessness

Mir Ali, Emily Rosenoff and Harper Sutherland

Office of Behavioral Health, Disability, and Aging Policy
Overview and Introduction

- Data and Methods
- COVID-19 Related Analysis
- OUD Findings
- Conclusions
Data and Methods

COVID-19 Related Analysis

OUD Findings

Conclusions
IBM Explorys Therapeutic Dataset

- 39+ health system partners
- 71 million+ patients
- 400+ acute care facilities
- >400,000 providers & physicians

Geographic Distribution of Patients Represented in Data Set

Source: IBM Explorys as of March 8, 2019

Patient Count Ranges
- < 1,000
- 1,000 - 10,000
- > 10,000
### Measures of Patient Experience

#### Electronic Medical Records

**Patient Demographics**
- Age
- Race
- Ethnicity
- Gender
- Zip 3
- Payer
- Status
- Tenure

**Clinical**
- EMR and Billing Diagnoses
- Problem list, w/start & end dates
- Chief complaints
- Procedures; CPT, HCPCS, ICD-9/10
- Medical & Social History
- Surgical history
- Allergies

**Vitals & Biometrics**
- BP
- BMI
- Body temp
- Heart rate
- Respiratory rate
- BSA

**Social History**
- Alcohol use
- Tobacco use
- Screenings
- Vaccinations

#### Labs & Test Results

**Laboratory Data**
- CBC
- Fibrinogen
- Hemoglobin Alc
- BMP & CMP
- DHEA
- PSA
- Homocysteine
- C-reactive protein
- TSH & T4
- Testosterone
- Estradiol
- Amylase
- PT (Protime)
- Electrolytes
- ESR
- Glucose
- HCG
- Lipid profile
- Liver panel
- Microalbumin
- Sodium
- BNP

**Microbiology Data**
- Organism
- Antibiotic
- Susceptibility
- Sensitivity
- Order, collection, and result date
- Lab performed
- Specimen type
- Body site where specimen was drawn

#### Rx

**Therapeutics**
- Ambulatory & Inpatient
- Drug - Brand and Class; SNOMED, NDC, RxNorm
- Medication start & end dates
- Dosage, refills, & quantity
- Instructions

**Device**
- Manufacturer
- Brand
- Model no.
- Implant site
- Implant type
- Date of implantation and removal

**Assessments/PROs**
- PHQ2/9
- Pain Scores
- Fall Risk

**Measure**
- MOCA
- MMSE

**Health Care Provider**

**Demographics**
- Specialty
- Title
- Role
- PCP

**Hospital-Level Data**

**Utilization**
- Venue & service dates
- Encounters, admissions, and discharges; Inpatient, ambulatory, ED
- Inpatient, ambulatory, urgent care, home health, SNF, psych, hospice
- Length of Stay and Disposition
- Appointments; Missed, Cancelled, Scheduled, Left without being seen

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Note: Fields in each category are samples only.
Coding for Social Determinants of Health

Persons with potential health hazards related to socioeconomic and psychosocial circumstances Z55-65

- Z55 Problems related to education and literacy
- Z56 Problems related to employment and unemployment
- Z57 Occupational exposure to risk factors
- Z59 Problems related to housing and economic circumstances
- Z60 Problems related to social environment
- Z62 Problems related to upbringing
- Z63 Other problems related to primary support group, including family circumstances
- Z64 Problems related to certain psychosocial circumstances
- Z65 Problems related to other psychosocial circumstances

Z59 Problems related to housing and economic circumstances

- Z59.0 Homelessness
- Z59.1 Inadequate housing
- Z59.2 Discord with neighbors, lodgers and landlord
- Z59.3 Problems related to living in residential institution
- Z59.4 Lack of adequate food and safe drinking water
- Z59.5 Extreme poverty
- Z59.6 Low income
- Z59.7 Insufficient social insurance and welfare support
- Z59.8 Other problems related to housing and economic circumstances
- Z59.9 Problem related to housing and economic circumstances, unspecified
How do we know the patients were experiencing homelessness?

Barriers:
1) Extra paperwork
   - Creates extra paperwork; in most places, the question is not required
   - No billing incentive to ask the question
2) Bias
   - Are providers only asking the question when a person appears to be homeless?
   - Do patients feel stigma when replying “Yes”?

Other problems for researchers:
3) Are some providers more likely to code for homelessness?
   - Is that because of people experiencing homelessness access certain types of providers?
   - Looking longitudinally at healthcare experiences
4) Creates another definition of homeless

Marked with a Z59.0 code by the medical provider

Extra paperwork?  Bias?  Provider or encounter type?
## Explorys 2015-2019: Healthcare Setting of First Z59.0 Encounter

<table>
<thead>
<tr>
<th>Healthcare Setting</th>
<th>Number of Patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Inpatient</td>
<td>19,245</td>
<td>36%</td>
</tr>
<tr>
<td>Hospital Outpatient</td>
<td>2,782</td>
<td>5%</td>
</tr>
<tr>
<td>Hospital Emergency Room</td>
<td>15,683</td>
<td>29%</td>
</tr>
<tr>
<td>Office Visit</td>
<td>1,347</td>
<td>2%</td>
</tr>
<tr>
<td>Psychiatric Facility</td>
<td>1,140</td>
<td>2%</td>
</tr>
<tr>
<td>Others</td>
<td>939</td>
<td>2%</td>
</tr>
<tr>
<td>Missing</td>
<td>13,019</td>
<td>24%</td>
</tr>
<tr>
<td>Total*</td>
<td>54,155</td>
<td>100%</td>
</tr>
</tbody>
</table>
# Demographic Comparison Across Cohorts

<table>
<thead>
<tr>
<th></th>
<th>2019 AHAR (N=567,715)</th>
<th>Homeless Cohort (N=54,155)</th>
<th>Comparison Cohort (N=76,539)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 18</td>
<td>18.9%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>18 to 24</td>
<td>8.0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>25 to 49</td>
<td>73.1%</td>
<td>55%</td>
<td>55%</td>
</tr>
<tr>
<td>50 to 64</td>
<td>38%</td>
<td>38%</td>
<td>38%</td>
</tr>
<tr>
<td>65+</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>60.5%</td>
<td>67%</td>
<td>68%</td>
</tr>
<tr>
<td>Female</td>
<td>38.7%</td>
<td>33%</td>
<td>32%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Ethnicity</strong></th>
<th>2019 AHAR (N=567,715)</th>
<th>Homeless Cohort (N=54,155)</th>
<th>Comparison Cohort (N=76,539)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic/Latino</td>
<td>22.0%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Non-Hispanic/Latino</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>78.0%</td>
<td>61%</td>
<td>67%</td>
</tr>
<tr>
<td>White</td>
<td>47.7%</td>
<td>59%</td>
<td>73%</td>
</tr>
<tr>
<td>African American</td>
<td>39.8%</td>
<td>20%</td>
<td>14%</td>
</tr>
<tr>
<td>Asian</td>
<td>1.3%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Multiple Races</td>
<td>6.5%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Refused</td>
<td>-</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Unknown</td>
<td>-</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Missing</td>
<td>-</td>
<td>13%</td>
<td>4%</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>1.6%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Native American</td>
<td>3.2%</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Data and Methods

COVID-19 Related Analysis

SUD Findings

Conclusions
COVID-19 Analysis

Examined the prevalence of conditions assumed to put individuals at higher risk of severe disease from COVID-19 as of April 2020 guidance from CDC:

- Moderate to severe asthma.
- Liver disease.
- Chronic lung disease.
- Diabetes.
- Serious heart conditions.
- Chronic kidney disease and undergoing dialysis.
- Severe obesity (body mass index of 40 or higher).
- People who are immunocompromised.
Percentage of Patients with Each Condition by Housing Status

- Asthma: 24% Homeless Cohort, 27% Comparison Cohort
- Chronic Bronchitis: 5% Homeless Cohort, 17% Comparison Cohort
- Chronic Liver Disease: 12% Homeless Cohort, 7% Comparison Cohort
- Chronic Obstructive Lung Disease: 23% Homeless Cohort, 11% Comparison Cohort
- Diabetes (mellitus): 26% Homeless Cohort, 22% Comparison Cohort
- Heart Disease: 38% Homeless Cohort, 27% Comparison Cohort
- High Blood Pressure (essential hypertension): 51% Homeless Cohort, 49% Comparison Cohort
- Kidney Disease: 25% Homeless Cohort, 27% Comparison Cohort
- Obesity: 30% Homeless Cohort, 19% Comparison Cohort
- Pulmonary Emphysema: 3% Homeless Cohort, 5% Comparison Cohort
- Tobacco User: 63% Homeless Cohort, 37% Comparison Cohort

Legend:
- Blue: Homeless Cohort
- Orange: Comparison Cohort
Evolving Understanding of COVID-19 Risk Factors

Examined in Paper
Drawn from CDC Risk List April 2020

CDC Are At Increased Risk List
July 2020

- Cancer
- Chronic kidney disease
- COPD (chronic obstructive pulmonary disease)
- Immunocompromised state (weakened immune system) from solid organ transplant
- Obesity (body mass index [BMI] of 30 or higher)
- Serious heart conditions, such as heart failure, coronary artery disease, or cardiomyopathies
- Sickle cell disease
- Type 2 diabetes mellitus

CDC Might Be At Increased Risk List
July 2020

- Asthma (moderate-to-severe)
- Cerebrovascular disease
- Cystic fibrosis
- Hypertension or high blood pressure
- Immunocompromised state (weakened immune system) from blood or bone marrow transplant, immune deficiencies, HIV, use of corticosteroids, or use of other immune weakening medicines
- Neurologic conditions, such as dementia
- Liver disease
- Pregnancy
- Pulmonary fibrosis (having damaged or scarred lung tissues)
- Smoking
- Thalassemia (a type of blood disorder)
- Type 1 diabetes mellitus

Asthma
Chronic bronchitis
Chronic liver disease
Chronic obstructive lung disease
Diabetes (mellitus)
Heart disease
Hypertension
Kidney disease
Obesity
Pulmonary Emphysema
Tobacco user
Additional questions for future research

• What medical research has determined since we wrote the papers about which comorbidities are especially linked to adverse outcomes from COVID-19?
• How can we understand the vast racial disparities in infections and deaths from COVID-19 with what we know about the population of people experiencing homelessness?
Results showed high rates of infection in shelters where there had been clusters of COVID cases, but even in shelters with no a low number of COVID+ cases, there were 4-5% of residents who tested positive and 2-1% of staff who tested positive.
Hospitalized patients were more likely to be Hispanic or to be experiencing homelessness—

- 16% of the all the COVID+ patients were experiencing homelessness
- 24% of the non-ICU hospitalized patients were experiencing homelessness,
- 16% ICU patients w/o ventilation were experiencing homelessness;
- 15% ICU patients w/mechanical ventilation were experiencing homelessness, and
- 15% of patients who died had been homeless.
Findings show individuals experiencing homelessness at higher risk for hospitalization.
Exhibit 4 Adjusted odds of hospital admission among confirmed COVID-19 cases in California, 2020

- Race/ethnicity (ref: white)
  - African American
  - Asian
  - Hispanic
  - Other/unknown

- Sex (ref: female)
  - Male

- Age group, years (ref: 18-39)
  - 40-49
  - 50-59
  - 60-69
  - 70-79
  - 80+

- Insurance type (ref: commercial)
  - Medicaid
  - Medicare
  - Other
  - Self-pay/not reported

- Median income (ref: quartile 1)
  - Quartile 2
  - Quartile 3
  - Quartile 4

- Homeless status (ref: not homeless)
  - Homeless

- Smoking status (ref: current smoker)
  - Never a smoker
  - Previous smoker
  - Unknown

- Clinical characteristics
  - Type 2 diabetes
  - Hypertension
  - Depression
  - Congestive heart failure
  - Cardiovascular disease
  - Cancer
  - Chronic obstructive pulmonary disease
  - Asthma

- Adjusted odds of admission
Data and Methods

COVID-19 Related Analysis

OUD Findings

Conclusions
Comorbid Health Conditions and Treatment Utilization among Individuals Experiencing Homelessness

- Individuals experiencing homelessness have been particularly hard hit by the opioid crisis (Chaterjee et al., 2018).
- Opioid-related mortality has increased almost threefold among individuals experiencing homelessness, and they are nine times more likely to die from an opioid overdose compared to individuals with stable housing (US Conference of Mayors 2016).
- The opioid crisis might impact individuals experiencing homelessness in ways that are distinct from how it impacts individuals with stable housing.
- Literature on comorbid health conditions and health services utilization among adults with OUD who are experiencing homelessness is lacking.
Analytic Framework

- Retrospective observational cohort study utilizing 2015 – 2019 IBM Explorys
- 2,080 individuals with OUD who had a Z59.0 code
- 980 individuals with OUD covered under Medicaid matched on age and gender to the homeless cohort with OUD
Behavioral Health Conditions among Individuals with OUD

- Anxiety Disorder: 70% Homeless, 66% Medicaid
- Bipolar Disorder: 48% Homeless
- Major Depression: 67% Homeless, 62% Medicaid
- Mood Disorder: 80% Homeless, 74% Medicaid
- Schizophrenia: 22% Homeless, 8% Medicaid
- Alcohol Dependence: 44% Homeless, 29% Medicaid
- Cannabis Dependence: 30% Homeless, 23% Medicaid
- Stimulant Dependence: 30% Homeless, 9% Medicaid
- Nicotine Dependence: 92% Homeless, 85% Medicaid

Other conditions:
- Homeless: 48%
- Medicaid: 30%

Note: Percentages indicate the proportion of individuals with OUD who also have the specified condition.
Behavioral Health Treatment among Individuals with OUD

- Psychotropic Medication: 67% Homeless, 97% Medicaid
- Psychiatric Procedure: 25% Homeless, 43% Medicaid
- Buprenorphine: 24% Homeless, 30% Medicaid
- Methadone: 18% Homeless, 15% Medicaid
- Naloxone: 34% Homeless, 49% Medicaid
- Naltrexone: 7% Homeless, 6% Medicaid
Data and Methods

COVID-19 Related Analysis

SUD Findings

Conclusions
Conclusions:

- Our findings using EHR data largely confirms previous research that people experiencing homelessness have high prevalence of chronic disease and substance use disorders.

- Other research has been confirming individuals experiencing homelessness are at higher risk for hospitalization from COVID-19 than people who are not homelessness.

- Our research also highlights high rates of comorbid behavioral health conditions and low rates of behavioral health treatment utilization (esp. buprenorphine and naloxone) among individuals with OUD experiencing homelessness.

- Thus far, the incredible efforts to outreach to people experiencing homelessness, provide hotel rooms or otherwise reduce density of shelters seems to have paid off.

- We need to continue to focus on this high-need population.
Thank you!

For more information see: https://aspe.hhs.gov/homelessness

*Individuallys experiencing homelessness are likely to have medical conditions associated with severe illness from COVID-19*


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Links to Research Cited:


Questions?

For any additional questions please email: webinar@cceh.org