



## Transformation of Outpatient Mental Health Clinics to Crisis Stabilization Centers Grant: Data Analysis

Maryland Department of Health  
SFY 2021

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- ❖ Maryland Association for the Treatment of Opioid Dependence (MATOD)
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## Executive Summary

### Problem Statement

On April 13, 2020, the United States Secretary of Health and Human Services renewed the National Public Health Emergency Order related to the consequences of the opioid crisis.<sup>1</sup> Reflecting the national landscape, Marylanders continue to suffer a heavy burden with an estimated 400,000 mental and behavioral health crisis events occurring annually in the state.<sup>2</sup> The vast majority (83%) of persons in crisis utilize Emergency Departments (EDs) for care, despite these facilities being ill-equipped to provide crisis care, resulting in poor health outcomes for individuals, as well as losses in productivity for health care providers, first responders, and law enforcement.<sup>3</sup> The overwhelming conclusion is that in order to impact the behavioral and mental health crisis that is currently claiming an average of 2,000 lives annually, substantial investments must be made in creating access to Crisis Stabilization Centers and their services (CSC).<sup>4</sup>

### Background

The continuing opioid epidemic and a national rise in opioid-related fatal overdoses over the last decade demonstrates that the need for access to crisis stabilization services related to substance use disorder (SUD) treatment is of paramount importance. Maryland has been significantly impacted by this crisis. In the first six months of 2020 there were a total of 1,326 reported unintentional intoxication deaths of which 1,187 involved opioids (89.5%), representing a 9.4% increase in opioid fatalities from this same timeframe of 2019. The compounding isolation of the COVID-19 pandemic continues to have detrimental and lasting impacts on mental health – including increases in anxiety, depression, and suicide – and disproportionately affecting both low-income and communities of color who have historically faced challenges accessing behavioral health (BH) care. In April 2020, 13% of adults nationally reported experiencing psychological distress as compared with 4% in 2018, marking an increase of 10%.

Under a grant from the Opioid Operational Command Center (OOCC), the Office of Innovation, Research and Development (the Department) seated within the Maryland Department of Health (MDH) partnered with the Hilltop Institute (Hilltop) at the University of Maryland, Baltimore County to perform this data analysis. This descriptive analysis was undertaken in order to provide policy makers, regulatory agencies, payers, and Subject Matter Experts (SMEs) additional insight into where the greatest unmet behavioral health (BH) crisis needs are within Maryland as well as the capacity of Outpatient Mental Health Clinics (OMHCs) to expand to provide additional crisis stabilization infrastructure to address these needs. Where appropriate, BH was broken out by mental health disorder (MHD) and substance abuse disorder (SUD) for specific sections of this work.

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<sup>1</sup> [U.S. Department of Health and Human Services, Public Health Emergency](#)

<sup>2</sup> [American Community Survey 2017](#)

<sup>3</sup> [MIEMSS Hospital ED Overcrowding Report](#)

<sup>4</sup> [National Guidelines for Behavioral Health Crisis Care](#)

This analysis was structured around four primary aims:

1. Describe current utilization of emergency care for BH crisis (EMS / ED)
2. Describe admission rate from ED for Medicaid beneficiaries in BH crisis
3. Describe the alignment of BH services needs as measured by BH utilization of EMS and ED services with the distribution of OMHCs
4. Project the impact of increased crisis infrastructure on acute care utilization for BH crisis

## Data Sources

This descriptive analysis used a number of different types of data from a variety of different organizations including:

### Medicaid Claims Data for BH Services

Medicaid Management Information System (MMIS) Claims Data for utilization of OMHCs, EDs, and Inpatient Psychiatric care (CY2019, 18 years and older, restricted to Maryland providers).

### 9-1-1 EMS Data for BH Services

The Maryland Institute for Emergency Medical Services Systems (MIEMSS) provided eMEDS (the EMS Electronic Patient Care Reporting System) data for all 9-1-1 calls in Maryland for BH (CY2019, 18 years and older, restricted to Maryland providers).

### ED Utilization (All-Payer, All-cause and BH)

The Chesapeake Regional Information System for our Patients (CRISP) provided HSCRC patient-level 'casemix' data for ED utilization, All-Cause and BH (CY2019, 18 years and older, restricted to Maryland Providers).

### OMHC and OTP Providers

Lists of the licensed and operating OMHC and OTP providers were made available by the Behavioral Health Administration (BHA) and the Maryland Association for the Treatment of Opioid Dependence (MATOD), respectively (Licensed and operating in CY2019).

### Inpatient Psychiatric Providers

A list of hospitals with licensed inpatient psychiatric beds, and therefore the capacity to admit patients directly from the ED, was provided by the Office of Health Care Quality, (licensed and operating, CY2019).

## Methods

This report used a variety of analytical tools, including claims-based analyses, descriptive statistics, and geographic information system (GIS) mapping. An algorithm based on the MIEMSS-approved checklist for transportation to a crisis center provided the basis for determining the proportion of 9-1-1 calls for BH that could be treated appropriately in a crisis stabilization center (CSC).

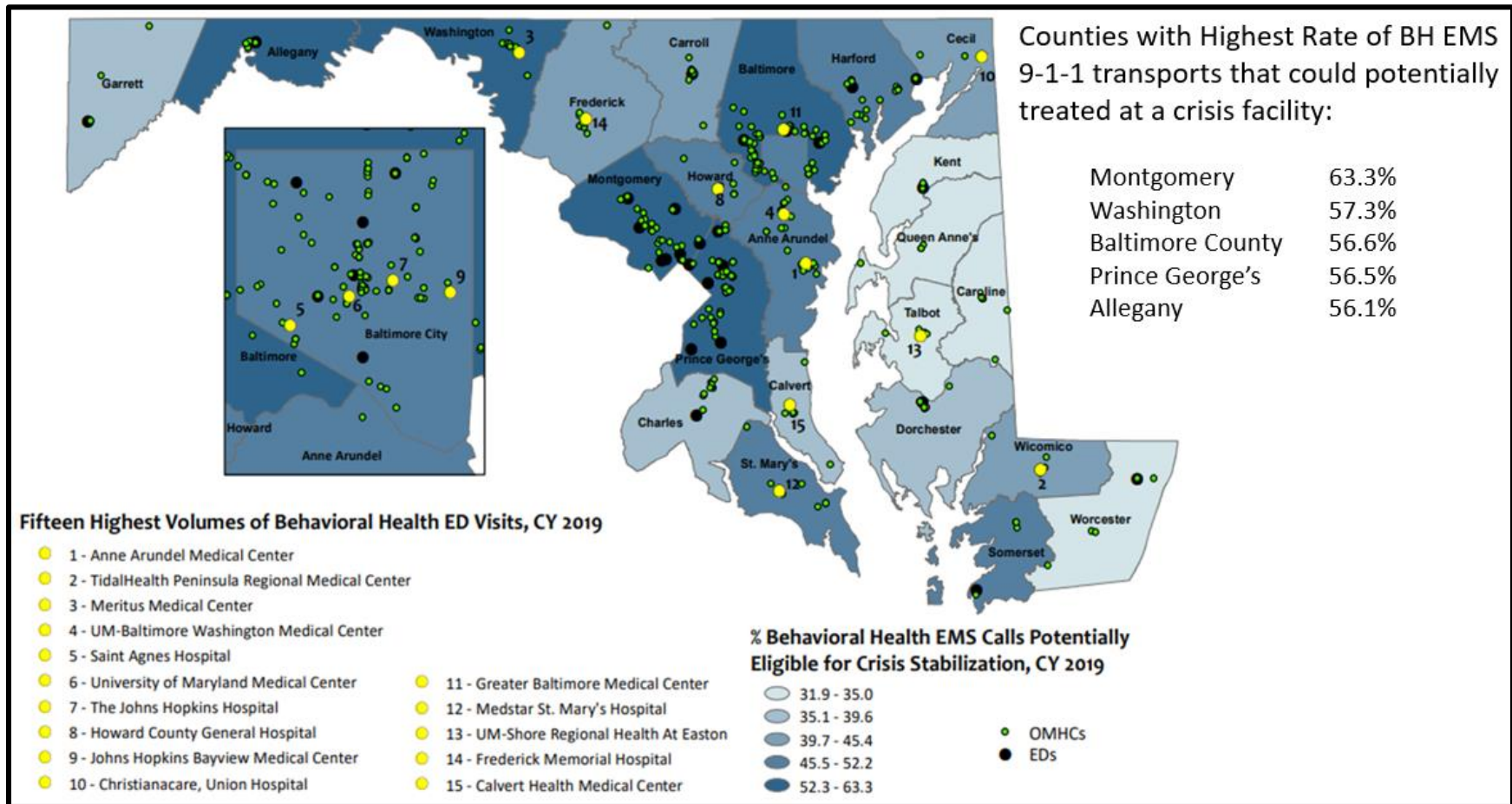
## Highlights

Across Maryland, ED utilization for BH-crisis varied by county, region, and even zip code. However, there are some statewide trends of note. First, when examining the number of ED walk-in patients versus EMS transported patients, the data show a substantially greater number of people use their own form of transportation to access the ED, as opposed to calling 9-1-1 in order to access acute care for a behavioral health (BH) crisis. This would indicate that a significant number of patients find independent means of transportation to EDs will need to be taken into consideration in the planning and engagement of communities as crisis services are expanded state-wide. This analysis also demonstrated that, in general, there are more 9-1-1 calls for MHD-crisis than SUD-crisis. Any plans to expand OMHCs to provide crisis services must take these needs into account. Lastly, 9-1-1 utilization for BH-crisis varies in distinct patterns during the day, as well as by day of the week, and these patterns were observed in both urban and rural areas. Stakeholders should consider the most effective hours of operation based on this utilization data in order to service the greatest number of patients. The Department found that 81% 9-1-1 calls for BH-crisis occurred between 8AM and 1AM. If the state chooses to expand in a phased fashion with 16/7 models leading into fully operational 24/7 models, these patterns of utilization can be used to guide hours of operation.

GIS mapping indicates that community based behavioral health provider networks are generally co-located with acute care networks and population centers. Some rural regions of the state have a limited number of both outpatient as well as acute care BH providers. When provider networks are compared to zip-code level maps of EMS 9-1-1 calls for BH, it is clear that there is substantial overlap between the need (as measured by 9-1-1 calls and high-volume ED use for BH-crisis) and outpatient BH provider locations. Stakeholders have voiced concerns that if Crisis Stabilization Facilities (CSFs) are located too far away from EDs, it will be difficult for populations to shift utilization patterns and cumbersome for law enforcement (LE) and EMS agencies to integrate these spaces into their workflows. The Department's findings that there are many outpatient providers in close proximity to the acute care providers currently caring for persons in BH-crisis lends credence to the feasibility of expanding OMHCs expanding to provide crisis services.

Analysis of the proportion of EMS 9-1-1 calls for BH-crisis that would have been eligible for transportation to a crisis center determined that a substantial proportion – up to 63% in some counties – of persons who called 9-1-1 for a BH-crisis met the clinical criteria for transportation to a CSF had it been available (range: 32 – 63%). The Eastern Shore and Western Region of Maryland have some of the highest proportions of persons who clinically qualified for transportation to a crisis facility based on the department's analysis; however, these areas of the state also have some of the lowest concentrations of outpatient behavioral health providers. These findings suggest that: substantial proportion persons seeking BH-crisis care from acute care providers (EMS and EDs) could be safely provided care in CSFs were they available; and, in many regions of the state there are robust provider networks in close proximity to current acute care providers that could be leveraged to expand to provide crisis services. However, in some areas of the state with the greatest need for additional community-based crisis care there are a limited number of providers who may have the capacity to expand to meet this need (see Figure E.1 on the following page for additional detail).

Figure 4 E.1. GIS map of the distribution of high volume OMHCs and Hospitals, by the frequency distribution of 9-1-1 calls for BH-crisis that were potentially eligible for transportation to a crisis service provider as opposed to an ED, CY2019 (HSCRC All-Payer Casemix data, BHA licensing data, eMEDs data courtesy of MIEMSS)



## Section 1: Background

### ***Background***

The continuing opioid epidemic and a national rise in opioid-related deaths over the last several years demonstrates that the need for access to crisis stabilization services related to substance use disorder (SUD) treatment is of paramount importance. Maryland has been significantly impacted by this crisis. In the first six months of 2020 there were a total of 1,326 reported unintentional intoxication deaths of which 1,187 involved opioids (89.5%), representing a 9.4% increase in opioid fatalities from this same timeframe of 2019. The compounding isolation of the COVID-19 pandemic continues to have detrimental and lasting impacts on mental health – including increases in anxiety, depression, and suicide – and disproportionately affects both low-income and communities of color who have historically faced challenges accessing behavioral health (BH) care. In April 2020, 13% of adults nationally reported experiencing psychological distress as compared with 4% in 2018, marking an increase of ~10%.

An estimated ~400,000 Marylanders experience a BH crisis annually. The vast majority (83%) of persons in crisis seek – and receive – care in Emergency Departments (EDs), despite these facilities being ill equipped to provide crisis care, resulting in poor health outcomes for individuals, as well as losses in productivity for health care providers (HCP), first responders (EMS), and law enforcement (LE).

### ***Purpose of Analysis***

Under a grant from the Opioid Operational Command Center (OOCC), the Office of Innovation, Research and Development (IRD) seated within the Maryland Department of Health (MDH) partnered with the Hilltop Institute (Hilltop) at the University of Maryland Baltimore County to perform this data analysis. This descriptive analysis was undertaken in order to provide policy makers, regulatory agencies, payers, and SMEs additional insight into where the greatest unmet behavioral health crisis needs are within Maryland as well as the capacity of Outpatient Mental Health Clinics (OMHCs) to expand to provide additional crisis stabilization infrastructure to address these needs. This analysis specifically focused on determining differences in regional needs and capacity, as well as the generation of models predicting the proportion of persons in crisis who could have been safely transported to – and received care from – a crisis stabilization facility were such facilities available.

### ***Primary Aims and Research Questions***

This analysis was structured around four primary aims:

#### ***PRIMARY AIM 1 – DESCRIBE CURRENT UTILIZATION OF EMERGENCY CARE FOR BH CRISIS (EMS / ED)***

- A. Are there areas of the state with more burden than others with regard to ED utilization for BH crisis?
- B. Does Medicaid ED utilization data serve as a good proxy for overall utilization of ED for BH Crisis?
- C. Are there differences in the distribution of high-utilizers of EDs for BH-crisis in Maryland? Are there differences by MHD vs SUD?
- D. Are there differences in how 9-1-1 EMS services are used for BH-crisis across the state? Are there regional differences in overall calls or by MH / SUD?
- E. When people access the ED for BH crisis, are they equally likely to be transported by EMS or to walk in? Are there differences by hospital / region?



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- F. Patients decline to be transported to the ED by EMS for BH-crisis – are there differences in the proportions of patients who refuse transport across the state? Do refusal rates differ by MHD-crisis or SUD-crisis?
- G. Are there differences in the frequency of EMS utilization for BH-crisis by time of day or day of the week? Are there differences in call frequency by MHD or SUD-crisis?

**PRIMARY AIM 2** – DESCRIBE RATE OF ADMISSION FROM ED TO INPATIENT SETTING FOR MEDICAID BENEFICIARIES IN BH CRISIS

- A. What proportion of Medicaid beneficiaries seen in the ED for BH crisis are subsequently admitted for inpatient care – are there differences across the state in admission rates?
- B. Are there differences in admission rates from ED to inpatient care for Medicaid beneficiaries in BH crisis by MH; SUD; hospital; region?

**PRIMARY AIM 3** – DESCRIBE THE ALIGNMENT OF NEEDS FOR BH CRISIS SERVICES (AS MEASURED BY BH UTILIZATION OF EMS AND ED SERVICES) WITH THE DISTRIBUTION OF OMHCs

- A. How is the distribution of OMHCs aligned with the distribution of high-volume ED utilization for BH (differences by MH / SUD)?
- B. How is the distribution of OMHCs aligned with the distribution of 9-1-1 calls for BH crisis – are there differences by MHD or SUD?

**PRIMARY AIM 4** – PROJECT THE IMPACT OF INCREASED CRISIS INFRASTRUCTURE ON ACUTE CARE UTILIZATION

- A. What proportion of 9-1-1 for BH-crisis could have been safely treated at an outpatient crisis facility if it were available? Are there differences by region, high volume hospital / MHD / SUD calls?
- B. How does the distribution of OMHCs align with the proportions of persons in BH crisis using EMS who could be treated in a crisis facility if it were available?

## Section 2: Methods and Data Sources

A variety of descriptive analytic methods were used to perform this analysis. Software packages used included: SAS (version 9.4), Excel (version 2016), eMEDS, and (ArcMap version 10.8 GIS data package). Analysis was conducted with CY2019 data, and only included persons who were 18 years and older at the time of the utilization/event. The following methods sections provide a high-level overview of the types of utilization data used, the inclusion and exclusion criteria for identifying BH, SUD and MHD utilization/events.

### *Utilization of Outpatient and Inpatient Services*

#### **Emergency Department (ED) Visits**

##### All-Payer All-Cause and BH-crisis Related Acute Care Utilization (ED)

CRISP's Public Health Dashboard was used to export HSCRC All-Payer Casemix data for CY2019 ED utilization for patients 18+ years old for all Maryland hospitals. Data was then disaggregated by the 'Condition' filter, such that a visit was labeled a MH-crisis if the condition was 'Any Mental Health Condition,' a SUD crisis if the condition was 'Alcohol Overdose,' 'Alcohol Related SUD,' or 'Opioid Overdose,' and a BH crisis if either MH or SUD. These conditions were chosen to align most closely with the eMEDS data provided courtesy of MIEMSS.

##### Medicaid Acute Care Utilization – All cause and BH-crisis related Utilization

Hilltop identified the number of Medicaid beneficiaries with an ED visit (All-Cause and BH) as during calendar year (CY) 2019 using MMIS Claims data (n= 65,109). This analysis was limited to participants 18 years or older as of the date of service and was restricted to EDs located in Maryland. Hilltop identified outpatient ED visits for BH (treated and discharged) as well as ED visits resulting in an inpatient admission (n=53,209, and n=11,900 respectively). Only those visits where the primary diagnosis was for a BH-related need were included in the analysis.

ICD-10 codes in Appendix A, B and C were used to classify an ED visit as a BH, which were further broken down into visits with the chief complaint a of Mental Health Disorder crisis (MHD) or Substance Use Disorder crisis (SUD) (n=41,612, and n=23,497 respectively). Individuals visiting an ED with chief complaint related to an MHD-crisis were identified by having a diagnosis that began with any of the ICD-10 diagnosis codes found in Appendix A or a claim where provider type is "55". Individuals seeking ED care with a chief complaint of an SUD-related crisis were identified by having a diagnosis that began with any of the ICD-10 diagnosis codes found in Appendix B or C, or a claim where provider type is "55".

Some ED visits were classified as both an MHD and SUD-related visit, consistent with the experience of beneficiaries. For each of these measures the results were broken down by county where the participant resides, county of hospital, and individual hospital.

## **Outpatient Mental Health Clinic Visits**

Medicaid claims data were used to identify the number of Medicaid beneficiaries aged 18 and older who received a service from an OMHC located in Maryland as well as the total volume of utilization of OMHC services in CY2019 (n= 121,614 persons receiving care). Utilization data was stratified by beneficiary county of Residence, and provider county (OMHC), as well as by Provider.

### ***Mapping***

Hilltop performed GIS mapping using ArcMap 10.8. Addresses of providers including: OMHCs, OTPs, EDs, and Hospitals (those with and without inpatient psychiatric facilities) were geocoded using the free geocoder on the United States Census Bureau's website. If a facility's address was not matched in the Census Bureau's geocoder, then the latitude and longitude for that facility were found manually using Google Maps. Facility addresses were obtained from the following sources:

- OMHC addresses were provided by the Maryland Department of Health's Behavioral Health Administration (BHA), (n=266).
- OTP addresses were provided by MATOD (n=95).
- ED and Hospital addresses were found on the websites of the Maryland Hospital Association (MHA) and the Maryland Health Care Commission (MHCC) (n=53 hospitals).
- A list of hospitals with inpatient psychiatric beds and specialty psychiatric hospitals was obtained from the MDH's Office of Health Care Quality (OHCQ) (n=37). The addresses of specialty psychiatric hospitals that were not on the websites of the MHA or the MHCC were found using Google.

### ***Transportation to BH Alternative Destination: Creation of the eMEDS Algorithm***

Medicaid, Hilltop and MIEMSS reviewed the MIEMSS-approved checklist for transportation to an alternative destination (other than the ED) for persons in BH crisis (All-payer). MIEMSS provided Hilltop with eMEDS data for all 9-1-1 calls for BH in Maryland between July 1st, 2018, to June 30th, 2020 (n=70,999). Calls were identified as BH using primary and secondary impression fields in the eMEDS data base. Only calls that occurred in CY2019 were used for this analysis, and persons under 18 were excluded (n= 28,350). Data was collapsed into one record per person and included times, dates, primary and secondary impression, vital signs, medications administered, and use of oxygen. An algorithm using the data was created with inclusion and exclusion criteria based on the MIEMSS-approved checklist (see Figure 1 for additional detail). A person was deemed eligible for transportation to an alternative destination (e.g., a crisis stabilization center) if they met all inclusion criteria, those who did not meet all inclusion criteria under this model would have been transported to the ED.

Figure 1. MIEMSS Approved Crisis Stabilization Center Transport Protocol.

Variable	eMEDS data field(s)	YES (transport to CCSC)	NO (transport to ED/exclude)	NOTES
Without Acute Medical or Trauma*	Secondary Impression Medications Administered	<p><b>Secondary Impression:</b></p> <ul style="list-style-type: none"> <li>- Behavioral/Psychiatric Disorder</li> <li>- ETOH Abuse w/ Intoxication</li> <li>- ETOH Use (Alcohol)</li> <li>- General Malaise/Sick</li> <li>- Illness, unspecified</li> <li>- No apparent Illness/Injury [Unknown]</li> <li>- Not Applicable</li> <li>- Poisoning/Overdose/Drug Abuse</li> <li>- Suspected Opioid Overdose</li> <li>- Withdrawal ETOH</li> <li>- Blank/Missing</li> </ul> <p style="text-align: center;"><b>AND</b></p> <p style="text-align: center;">No Medications Administered</p> <p style="text-align: center;"><b>OR</b></p> <p><b>If medications are administered, they are only either:</b></p> <ul style="list-style-type: none"> <li>- Oxygen**</li> <li>- Naloxone</li> </ul>	<p><b>Secondary Impression</b> Anyone with any other impressions</p> <p style="text-align: center;"><b>OR</b></p> <p><b>Medications Administered</b> Anyone with any other medication or combinations of medications other than Oxygen** and/or Naloxone</p>	<p>*Persons with acute medical or trauma cannot be transported to a crisis center.</p> <p>To be transported there must not be:</p> <ul style="list-style-type: none"> <li>- Significant head trauma</li> <li>- Thoracic trauma</li> <li>- Uncontrolled bleeding</li> <li>- New head trauma (ecchymosis, hematomas)</li> </ul> <p>**For Oxygen parameters see below specifications for allowable O2 administration: <i>“Pulse Oximetry and use of supplemental O2”</i></p>

Figure 1. MIEMSS Approved Crisis Stabilization Center Transport Protocol (continued).

Variable	eMEDS data field(s)	YES (transport to CCSC)	NO (transport to ED/exclude)	NOTES
Pulse Oximetry and use of supplemental O2	Vitals Pulse Oximetry Medications Administered	<p>Pulse oximetry greater than or equal to 93% and no supplemental oxygen administered</p> <p style="text-align: center;"><b>OR</b></p> <p><b>If Oxygen Administered:</b> For patients who received supplemental O2:</p> <ul style="list-style-type: none"> <li>- Received through Nasal cannula O2 only.</li> <li>- Last encounter available, SPO2 equal to or greater than 98%</li> </ul>	<p>Pulse oximetry less than 93% and no supplemental oxygen administered</p> <p style="text-align: center;"><b>OR</b></p> <p><b>If Oxygen Administered:</b></p> <ul style="list-style-type: none"> <li>- Any other O2 admin system (bagging, re-breather) during patient encounter</li> </ul> <p style="text-align: center;"><b>AND/OR</b></p> <ul style="list-style-type: none"> <li>- Below 98% SPO2</li> </ul>	<p>Exclude if no pulse oximetry</p> <p>Use last record available.</p>

Figure 1. MIEMSS Approved Crisis Stabilization Center Transport Protocol (continued).

Variable	eMEDS data field(s)	YES (transport to CCSC)	NO (transport to ED/exclude)	NOTES
Consent & Cooperate with Exam	Patient Disposition Glasgow Coma Scale	15 <b>total</b> points on Glasgow Coma Scale	14 or fewer <b>total</b> points on Glasgow Coma Scale	<b>If missing data, assume normal.</b> Impute 15.
Systolic BP	Vitals Systolic Blood Pressure (SBP)	Greater than or equal to 80 <b>AND</b> Less than or equal to 220 mmHg	Less than 80 <b>OR</b> Greater than 220 mmHg	No SBP measurements <b>AND</b> normal heart rate <b>and</b> Pulse Ox, input dummy normal value of 120 mm Hg.
Diastolic BP	Vitals Diastolic Blood Pressure (DBP)	Greater than or equal to 50 <b>AND</b> Less than or equal to 120 mmHg	Less than 50 <b>OR</b> Greater than 120 mmHg	No DBP measurements <b>AND</b> has normal heart rate <b>and</b> Pulse Ox, input dummy normal value of 80 mm Hg.
Pulse	Vitals Pulse	Pulse greater than or equal to 50 <b>AND</b> Less than or equal to 120	Pulse less than 50 <b>OR</b> Greater than 120	<b>Exclude patient if no pulse ever recorded.</b>
Respiratory Rate (RR)	Vitals Respiratory Rate	RR greater than or equal to 10 <b>AND</b> Less than or equal to 22	RR less than 10 <b>OR</b> Greater than 22	If no RR and SPO2 normal, <b>impute a value of 15.</b>
Blood Glucose (BG)	Vitals Blood Glucose Level	BG greater than or equal to 70 <b>AND</b> Less than or equal to 300 mg/dl	Blood glucose less than 70 <b>OR</b> Greater than 300 mg/dl	If no <b>blood glucose</b> , assume normal, <b>impute 100 mg/dl.</b>

**Regional Analysis**

The Department used the regions found in the annual HealthChoice evaluation<sup>5</sup> to group counties. Using this method increases the external validity of results. See Table 1 below for a list of how Maryland’s counties are grouped into regions.

Table 1. Maryland’s Regions and Counties

<b>Baltimore City Region</b>	<b>Baltimore Metro Region</b>	<b>Washington Metro Region</b>	<b>Eastern Shore Region</b>	<b>Southern Region</b>	<b>Western Region</b>
<b>Baltimore City</b>	Harford Baltimore Carrol Howard Anne Arundel	Prince George’s Montgomery	Somerset Worcester Dorchester Queen Anne’s Wicomico Talbot Cecil Kent	Charles St. Mary’s Calvert	Allegany Frederick Garrett Washington

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<sup>5</sup> [HealthChoice Evaluations](#)

## Section 3: Results

Results are presented in order of the specific aims and research questions used to guide this analysis. As this work is descriptive in nature and used a cross-sectional approach, it is important to remember that no conclusions regarding cause and effect can be drawn from this work; instead, this work can be used by policy makers and providers to plan next steps as Maryland works to form a comprehensive network of crisis services.

### Primary Aim 1

#### Research Question 1.A: Are there areas of the state with more burden than others with regard to ED utilization for BH crisis?

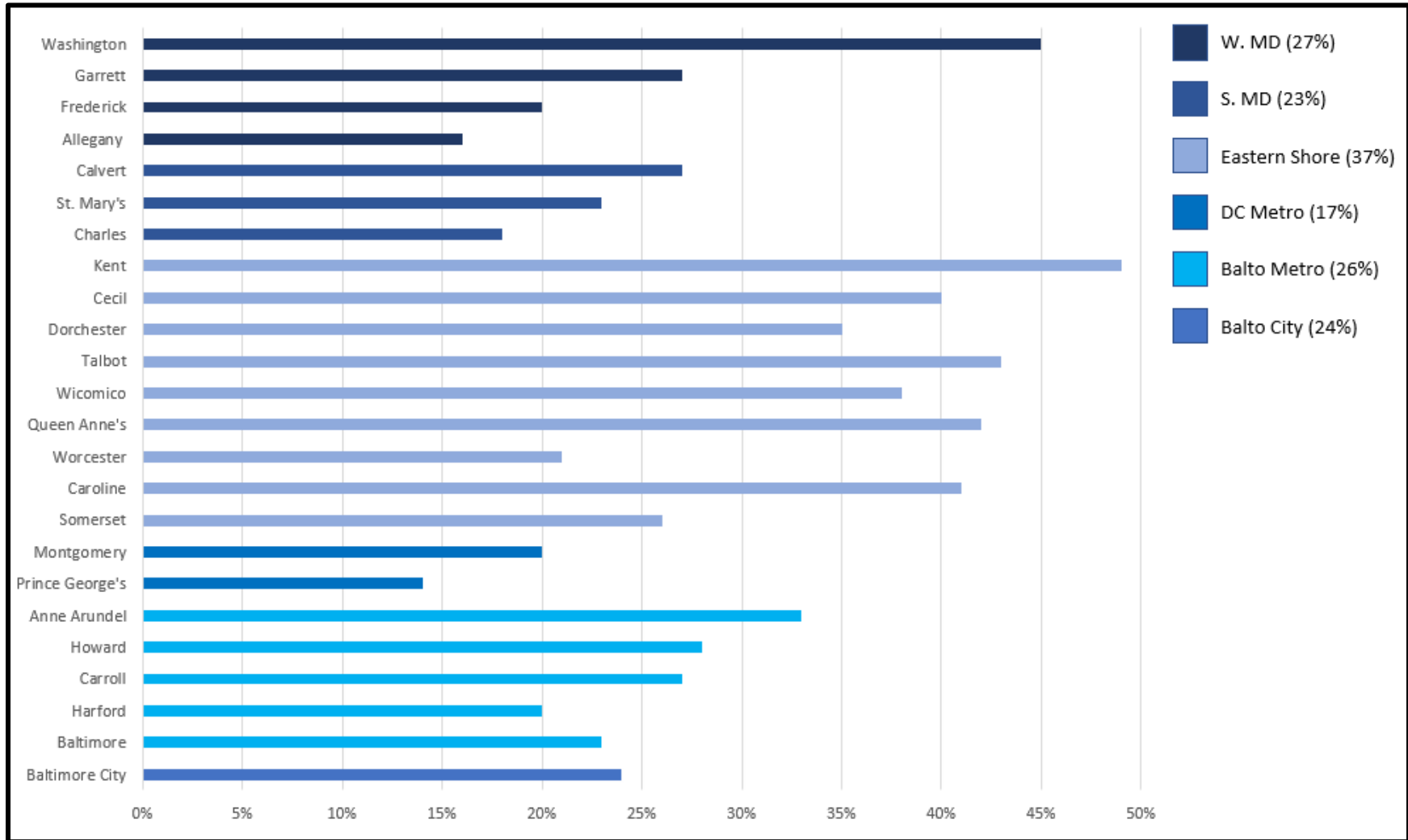
Some areas of the state have a higher burden of ED utilization for BH-crises than others. The Eastern Shore Region of Maryland had the overall highest percentage of ED visits for BH-crisis as compared to those who were seeking care for somatic needs. Two of the three counties statewide with the highest proportion of ED visits (BH/Somatic) were located in the Eastern Shore including: Kent and Talbot counties (49% and 43% respectively). Washington County in the Western Region had the second-highest proportion of BH/Somatic ED visits statewide (45%). Figure 1.A.1 on the following page provides additional information on a county and regional level.

When ED visits for BH-crisis were broken out by SUD and MHD, and the proportion of ED visits for each type of BH-crisis were compared, the majority of counties had an almost equal proportion of utilization for SUD and MHD related crisis (see Figure 1.A.2 below). In at least nine counties, MHD accounted for the majority of ED visits for BH-crisis (60-67%), only two counties, Somerset County and Prince George's County had a higher proportion of SUD-related crisis as compared to MHD-crisis (77% and 60% respectively). Figure 1.A.2 below provides additional details.



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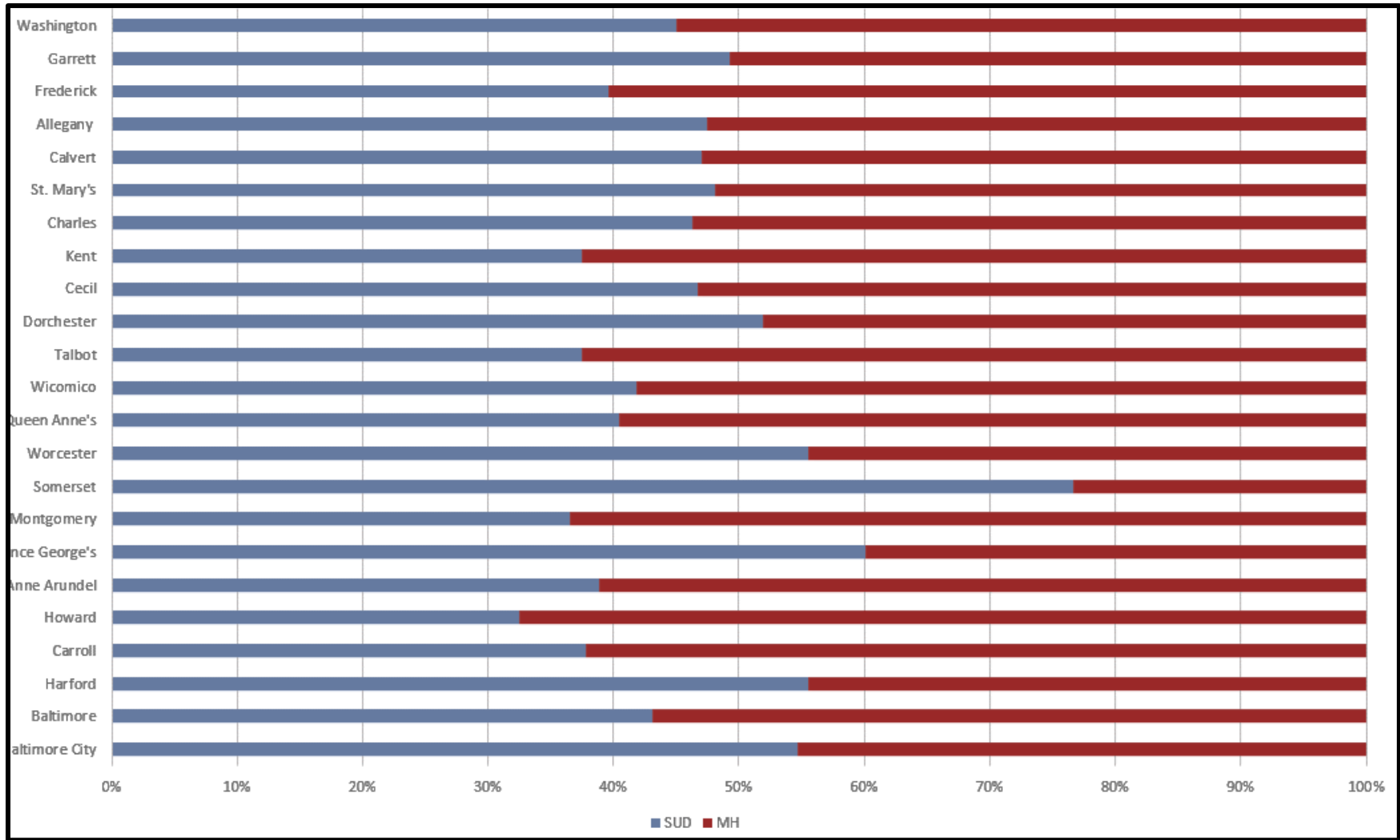
Figure 1.A.1 Percentage of all ED visits for BH crisis, by county, CY2019 (HSCRC All-Payer Casemix data).



Notes: Counties are organized by region in Figure 1.A.1

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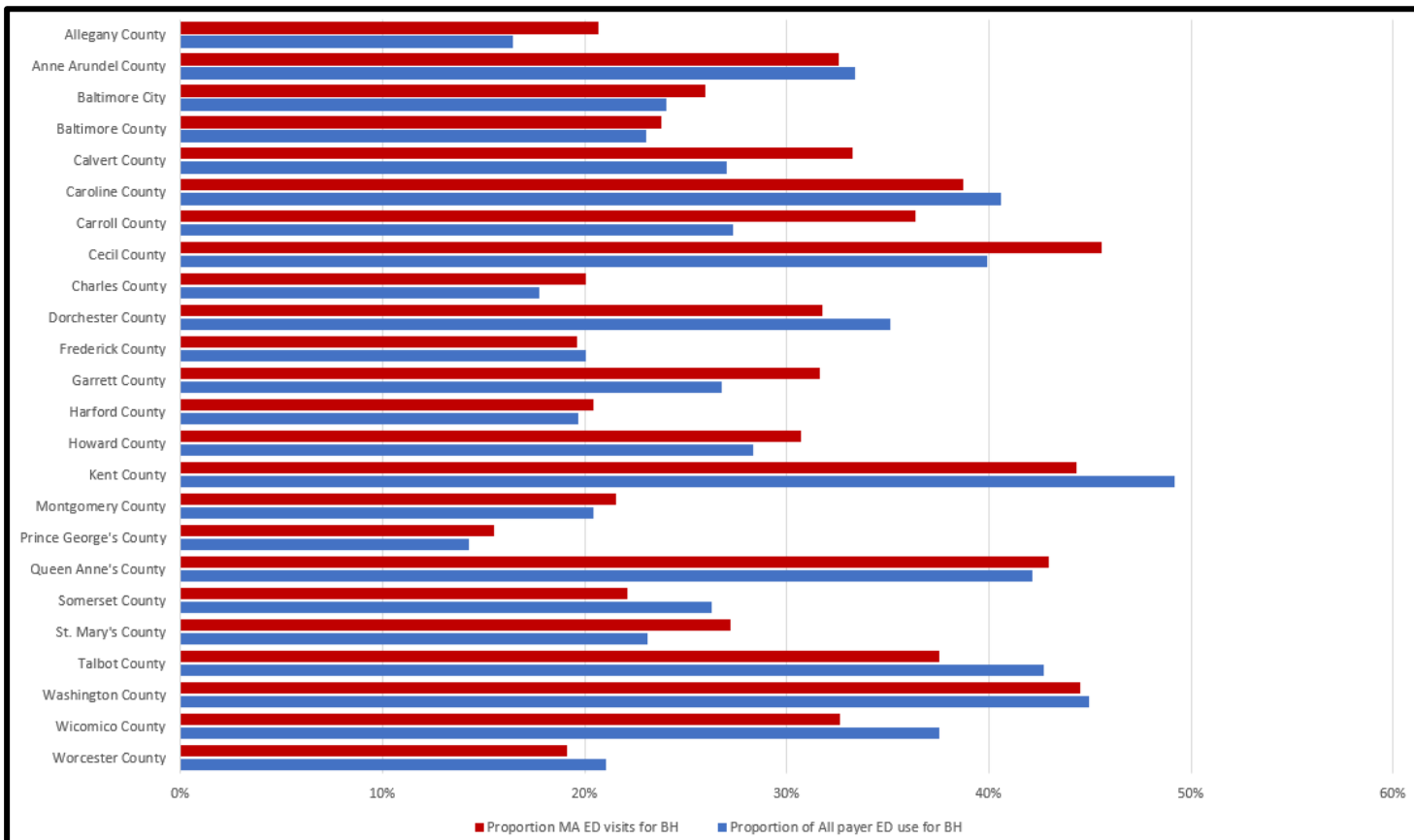
Figure 1.A.2 Comparison of the proportions of all ED visits for BH-crisis by proportion classified as SUD-crisis vs. MHD-crisis, by county, CY2019 (HSCRC All-Payer Casemix data).



**Research Question 1.B: Does Medicaid ED utilization data serve as a good proxy for overall utilization of ED for BH Crisis?**

Across the state, Medicaid beneficiaries ages 18 years and older appear to use the ED for BH-crisis in ways that mirror All-payer populations, supporting the long-standing supposition that when All-payer data is not available, Medicaid data can be used as a proxy for the wider population’s experience. This allows the Department to use Medicaid data to model the impact that implementation of additional community-based crisis services might have on inpatient admissions for both the Medicaid population, as well as to reasonably estimate these impacts on All-payer admissions.

*Figure 1.B.1 Comparison of the proportions of ED utilization for BH-crisis: All-payers vs. Medicaid beneficiaries, by county, CY2019 (HSCRC All-Payer Casemix, MMIS Claims data).*



**Research Question 1.C: Are there differences in the distribution of high-utilizers of EDs for BH-crisis in Maryland? Are there differences by MHD vs SUD?**

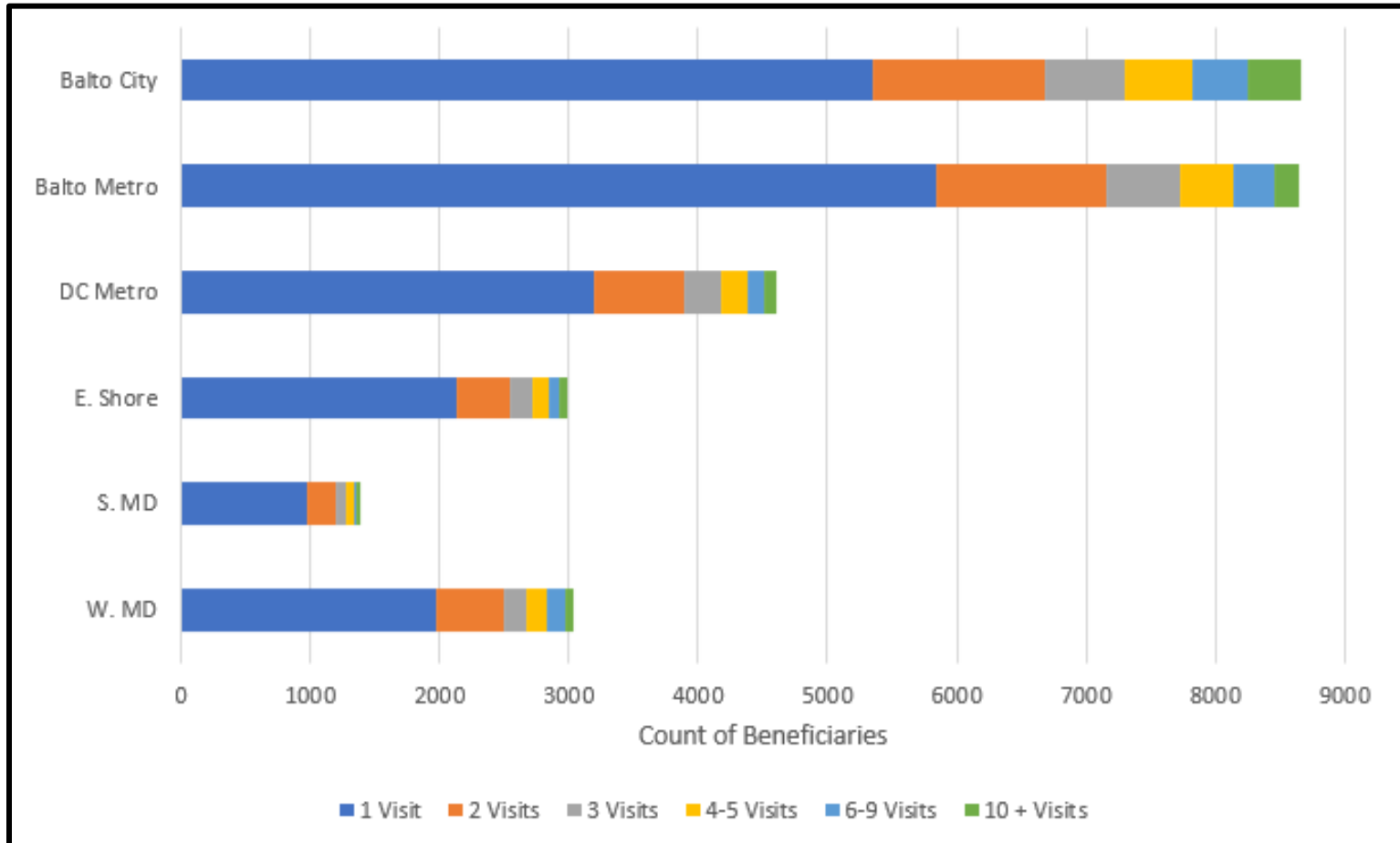
Some Marylanders with SUD or MHD utilize the ED for BH-crisis more than others; these people are termed “high utilizers.” Efforts across the state focus on assisting high utilizers to link with care in ways that allow them to access care in community settings as opposed to acute care settings. Statewide, at least 30% of patients sought care in EDs for BH-crisis multiple times in a calendar year. In some areas of the state this proportion was substantially higher, with nearly 40% of persons seeking care multiple times a year in the ED for BH-crisis (Baltimore city and Western Maryland). Taken together, this evidence suggests the need for more appropriate crisis response resources that are targeted on a regional level.

The Baltimore Metro region is home to a population nearly 3.5 times that of Baltimore City, however; Baltimore City and Baltimore Metro hospitals saw virtually the same number persons seeking care in their EDs for BH-crisis in CY2019 suggesting that there is either a substantially higher need in the City, or that persons from the Metro Region travel to receive care in the City (see Figure 1.C.1 for additional detail). It is important to note that EDs in Baltimore City saw the highest proportion of persons multiple times a year for BH-crisis, with nearly 40% of the persons seeking care at an ED for BH-crisis in Baltimore having two or more ED visits in one year for BH. This pattern was especially evident for those Medicaid beneficiaries who sought ED care for a BH-crisis 3 or more times in a year (see Figure 1.C.2 for additional information). Baltimore City also had the highest number “super utilizers” (persons with 10+ ED visits a year for BH-crisis) with nearly 5% of persons seeking care in an ED for BH-crisis having 10+ ED visits in a year as compared to other regions of the state with only 2-3% of persons seeking care for BH-crisis having 10+ visits a year. The Western Maryland Region had the second highest number of high utilizers of EDs for BH-crisis, in alignment with results under 1.A.1.

The Department analyzed whether there were differences in the number, or distribution of high utilizers by SUD-need or MHD-need. There were no differences observed, indicating that as the state moves towards planning for crisis services equal emphasis should be placed on SUD and MHD needs among the high-utilizer populations.

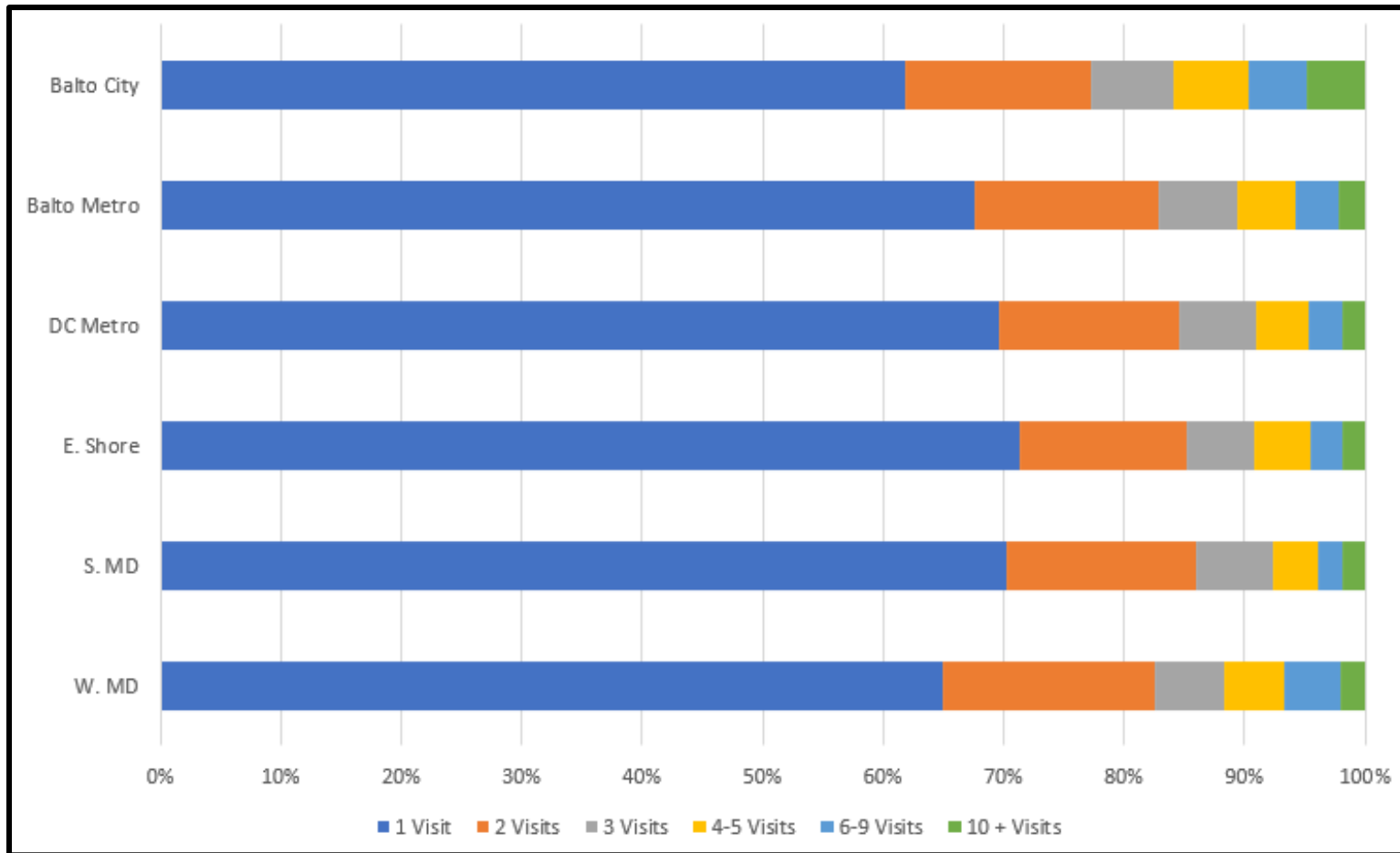
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Figure 1.C.1 Count of beneficiaries with a certain number of BH ED visits, by region CY2019 (MMIS Claims data).



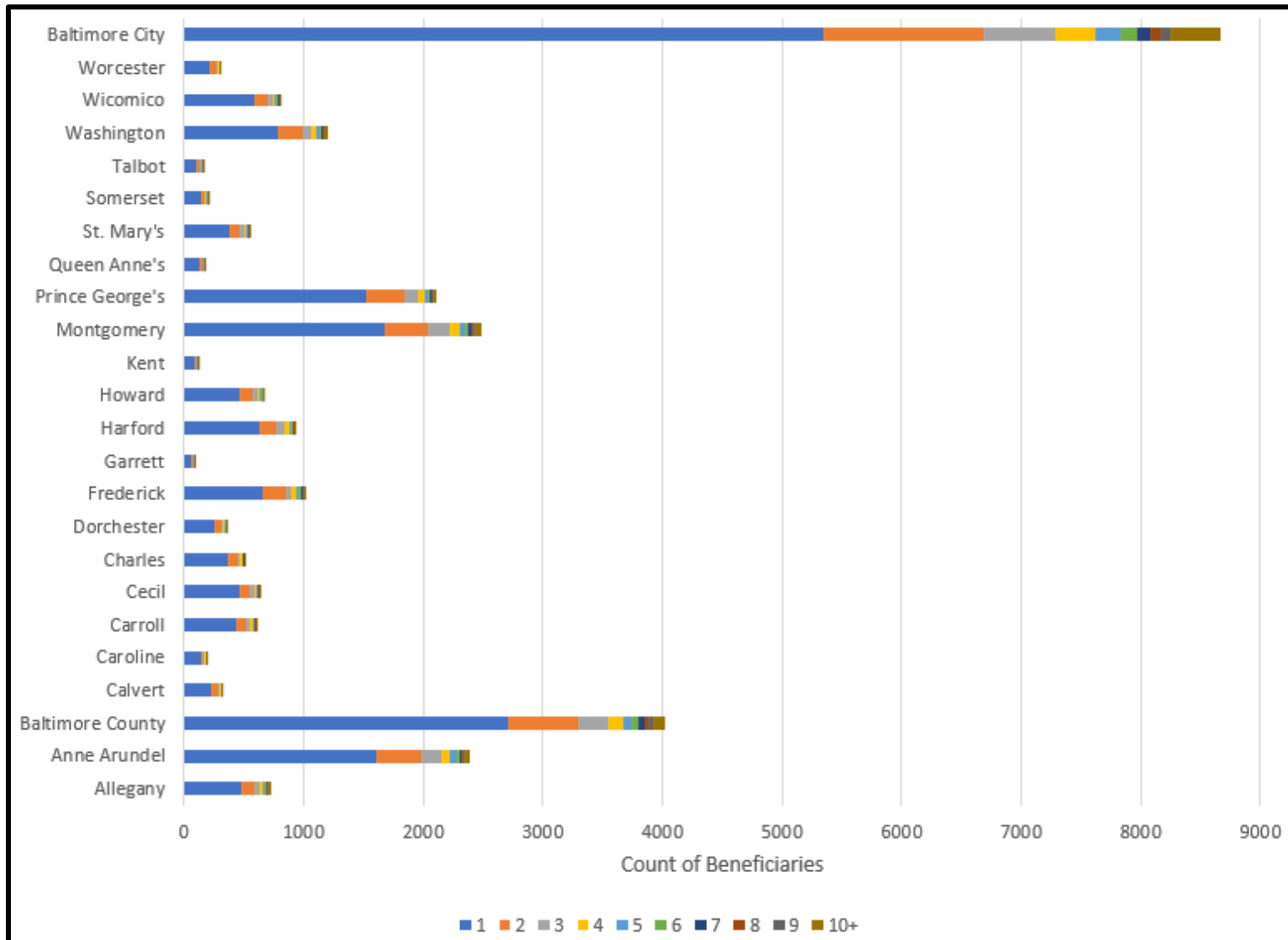
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Figure 1.C.2 Number of times beneficiaries used EDs for BH-crisis in one year, proportion of total ED use, by region, CY2019 (MMIS Claims data).



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Figure 1.C.3 Count of beneficiaries with a certain number of BH ED visits, by county CY2019 (MMIS Claims data).



**Research Question 1.D. Are there differences in how 9-1-1 EMS services are used for BH-crisis across the state? Are there regional differences in overall calls or by MH / SUD?**

Analysis of the geographic distribution of 9-1-1 calls for BH-crisis demonstrates that there are substantial geographic differences in the use of EMS for BH-crisis. Zip codes with the highest number of incidents in CY2019 - tier 5 (342 – 788 calls) and tier 6 (789 – 1530 calls) - were predominantly located in the high-population areas of the state (see Figure 1.D.1). These areas include Baltimore City and the surrounding metropolitan area, Montgomery County and Prince George’s Counties. The majority of zip codes in Allegany and Washington Counties (Western Maryland) as well as Cecil County in the northeast corner of the state had fewer EMS calls for BH-crisis than other areas of the state, however, several zip codes in these counties diverged from this pattern and demonstrated incident counts that are disproportionately high relative to their populations (see Figure 1.D.1 for additional detail). As the state moves forward with expanding the provision of crisis services statewide, the unique needs and challenges of providing crisis services in rural areas will need to be taken into consideration.

***Comparison of MHD vs. SUD***

The Department mapped the distribution of 9-1-1 calls for MHD and SUD crisis and compared the frequency distributions by zip code. In general, MDH were more evenly distributed across zip codes than SUD calls (see Figure 1.D.2 and 1.D.3 for additional information). These differences may reflect a number of factors including but not limited to access to community-based care, attitudes towards care, access to personal transportation, or prevalence of disease.



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Figure 1.D.1 GIS map of the frequency distribution of all 9-1-1 EMS calls for BH-crisis, by zip code, CY2019 (All-Payers, eMEDs data courtesy of MIEMSS).

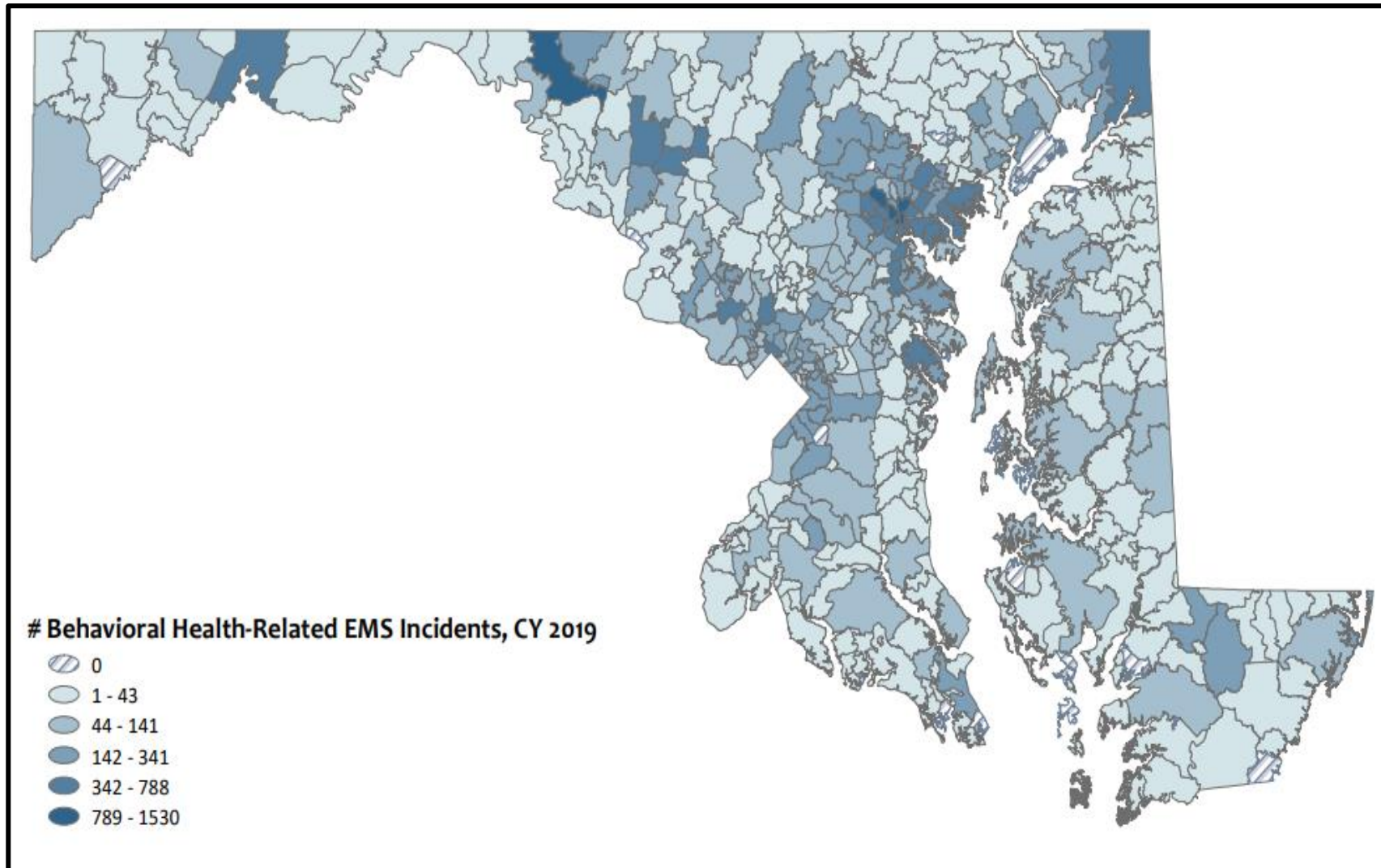


Figure 1.D.2 GIS map of the frequency distribution of all 9-1-1 EMS calls for MHD-crisis, by zip code, CY2019 (All-Payers, eMEDs data courtesy of MIEMSS).

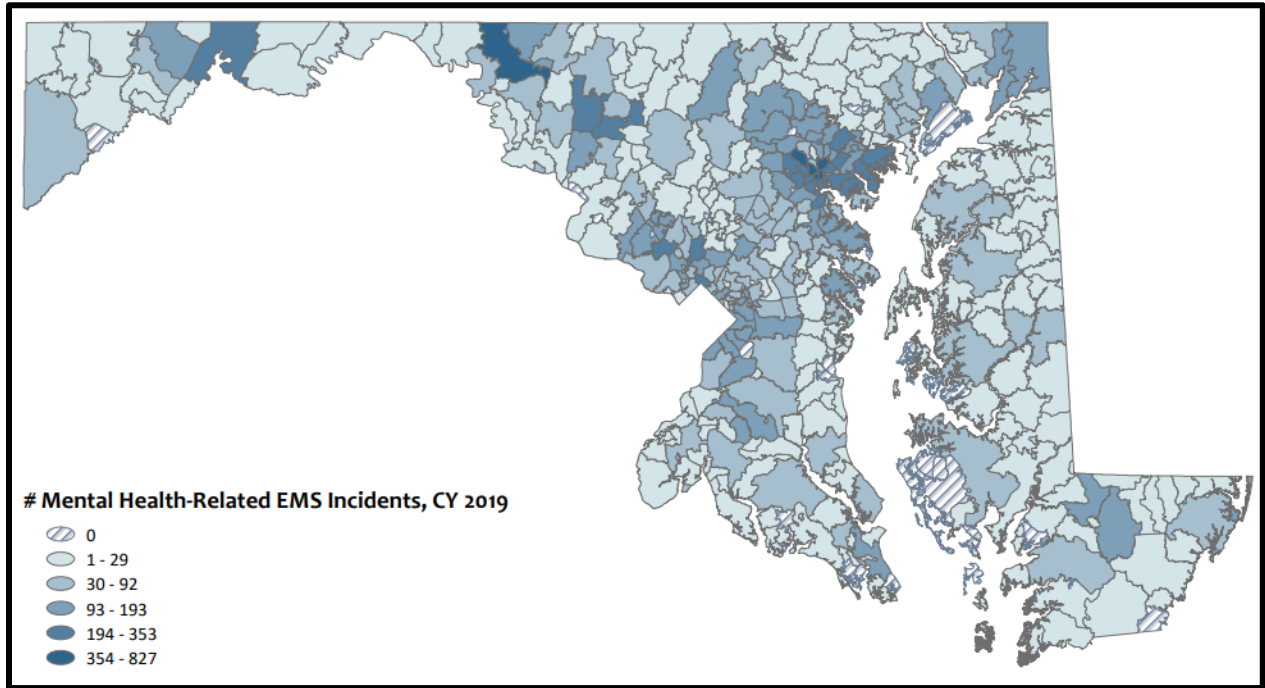
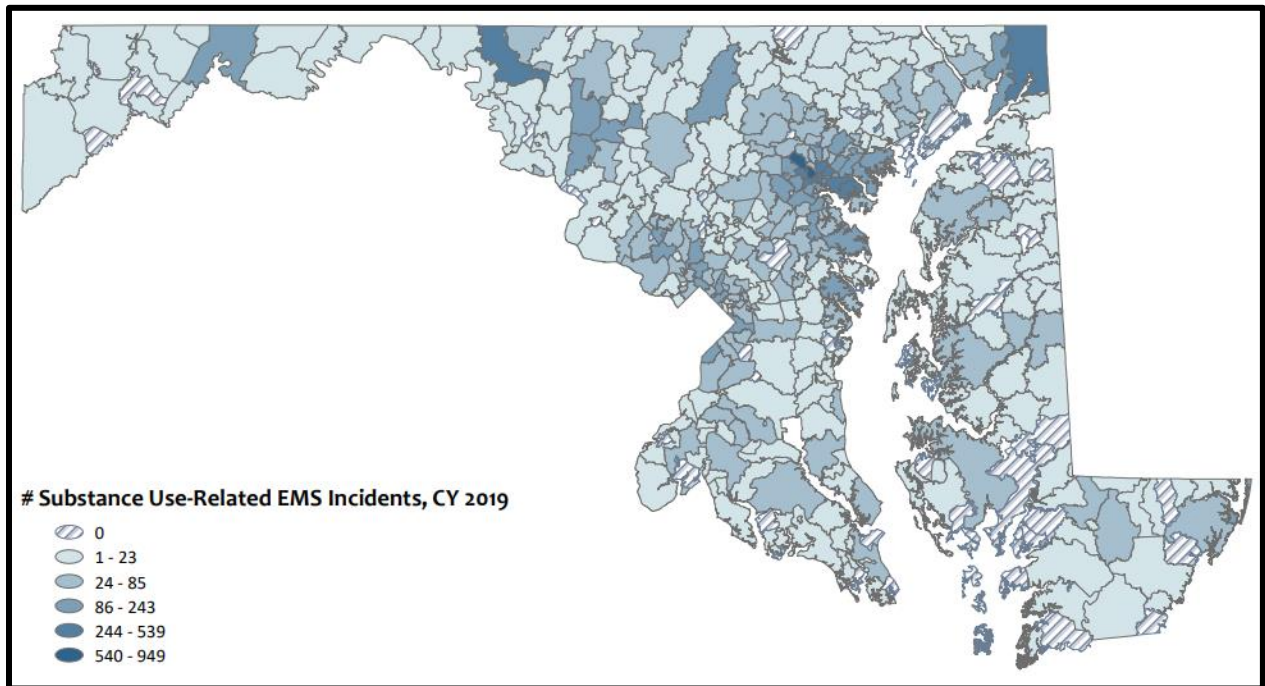


Figure 1.D.3 GIS map of the frequency distribution of all 9-1-1 EMS calls for SUD-crisis, by zip code, CY2019 (All-Payers, eMEDs data courtesy of MIEMSS).



**Research Question 1.E: When people access the ED for BH crisis, are they equally likely to be transported by EMS or to walk in? Are there differences by hospital / region?**

While EMS plays a pivotal role in the crisis response system, individuals also are transported to the ED by other means. Overall, EMS transports represent a low proportion of total ED volume. The Department analyzed the proportion of persons who sought care in Maryland ED's for BH-crisis in CY2019 by their mode of transportation to the ED (see Figure 1.E.1 for additional details). The Baltimore Metro region – one of the most populous in the state – had the highest total number of ED visits for BH-crisis followed by Baltimore City and the Eastern Shore. However, the proportion of persons brought to the ED by EMS as opposed to having their own mode of transportation was substantially higher in Baltimore City as compared with other areas of the state, with the D.C. Metro Region having the second highest proportion of EMS/walk-in transports for BH-crisis (see Figure 1.E.1 for additional regional differences). The rural areas tend to have the lowest proportion of EMS transports overall, perhaps reflecting the increased access to personal transportation and longer wait times for EMS services than more urban areas.

***Differences between MHD and SUD***

When the Department evaluated differences in transportation mode between persons seeking care for MDH and SUD in EDs, a distinct pattern emerged. Specifically, in each region across the state, persons who were seen in the ED for SUD crises were substantially more likely to have been transported there via EMS as opposed to another form of transportation. When disaggregated by county, Allegany County (19% MH/20% SUD) in Western Maryland is an outlier, having a higher proportion of MH ED visits that originate with an EMS transport. (see Table 2.)

***Limitations***

One limitation to this work is that two disparate data sets were used to calculate these measures – the HSCRC All-Payer data was used to provide All ED utilization, whereas EMS transportation data (eMEDS) was provided by MIEMSS. These two systems use different case definitions for categorizing behavioral health crisis services. The HSCRC's inclusion criteria are much wider using all 24-fields of complaints; whereas the eMEDs system categorizes based on two fields. Therefore, the estimates of the difference between the proportions of persons who were transported via, vs. the proportion who procured their own transportation may be overestimated.

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Figure 1.E.1 Frequency distribution comparing transportation methods utilized for BH-crisis, by region, CY2019 (HSCRC All-Payer Casemix, eMEDS data courtesy of MIEMSS).

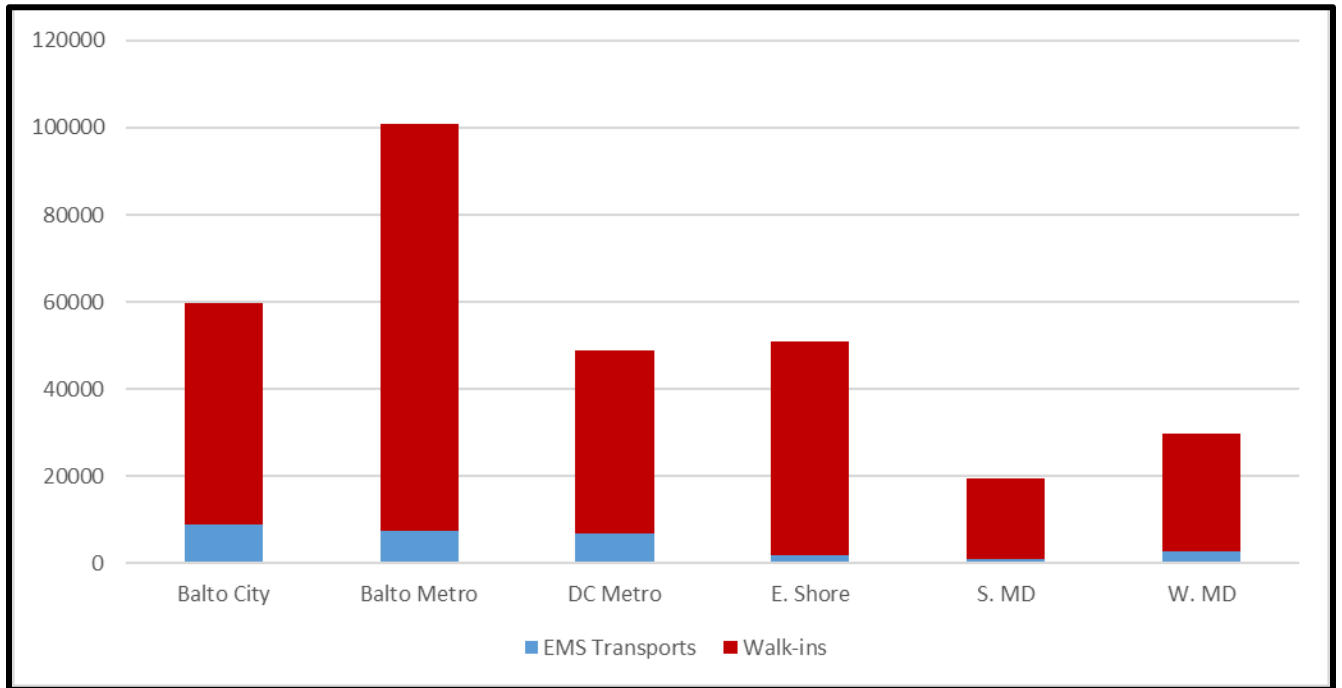


Figure 1.E.2 Comparison of proportion of transportation methods use by persons accessing EDs for MHD vs SUD care, by region, CY2019 (HSCRC All-Payer Casemix, eMEDS data courtesy of MIEMSS).

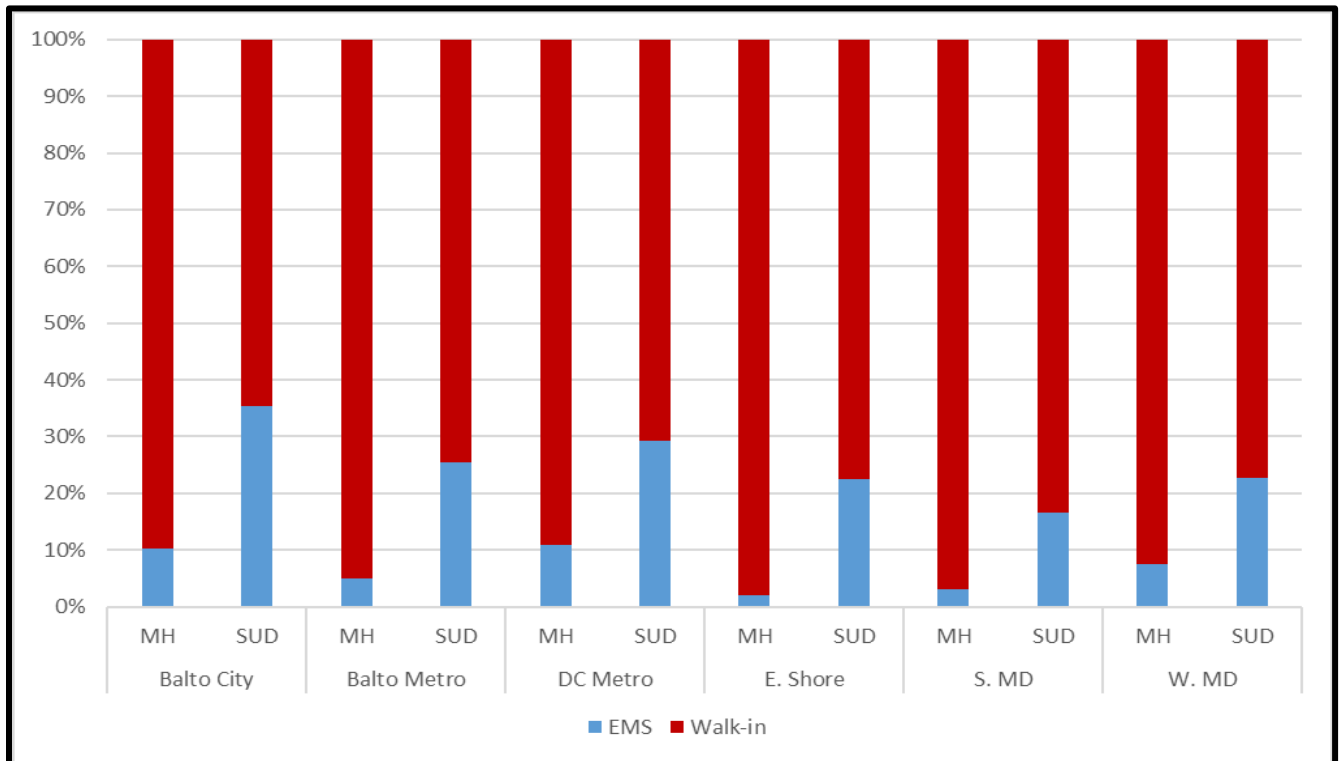


Table 2. *Percentage of MHD and SUD Visits, by county, CY2019 (HSCRC All-Payer Casemix, eMEDS data courtesy of MIEMSS).*

County	Region	% MH Visits From	% SUD Visits From
Baltimore City	Balto City	10%	35%
Baltimore	Balto Metro	7%	31%
Harford	Balto Metro	6%	20%
Carroll	Balto Metro	5%	19%
Howard	Balto Metro	4%	20%
Anne Arundel	Balto Metro	3%	24%
Prince George's	DC Metro	10%	35%
Montgomery	DC Metro	12%	24%
Somerset	Eastern Shore	2%	24%
Caroline	Eastern Shore	2%	27%
Worcester	Eastern Shore	4%	24%
Queen Anne's	Eastern Shore	2%	28%
Wicomico	Eastern Shore	2%	17%
Talbot	Eastern Shore	2%	15%
Dorchester	Eastern Shore	2%	14%
Cecil	Eastern Shore	2%	30%
Kent	Eastern Shore	1%	21%
Charles	Southern	4%	16%
St. Mary's	Southern	3%	17%
Calvert	Southern	1%	16%
Allegany	Western	19%	20%
Frederick	Western	9%	22%
Garrett	Western	5%	14%
Washington	Western	5%	26%

**Research Question 1.F: Patients decline to be transported to the ED by EMS for BH-crisis – are there differences in the proportions of patients who refuse transport across the state? Do refusal rates differ by MHD-crisis or SUD-crisis?**

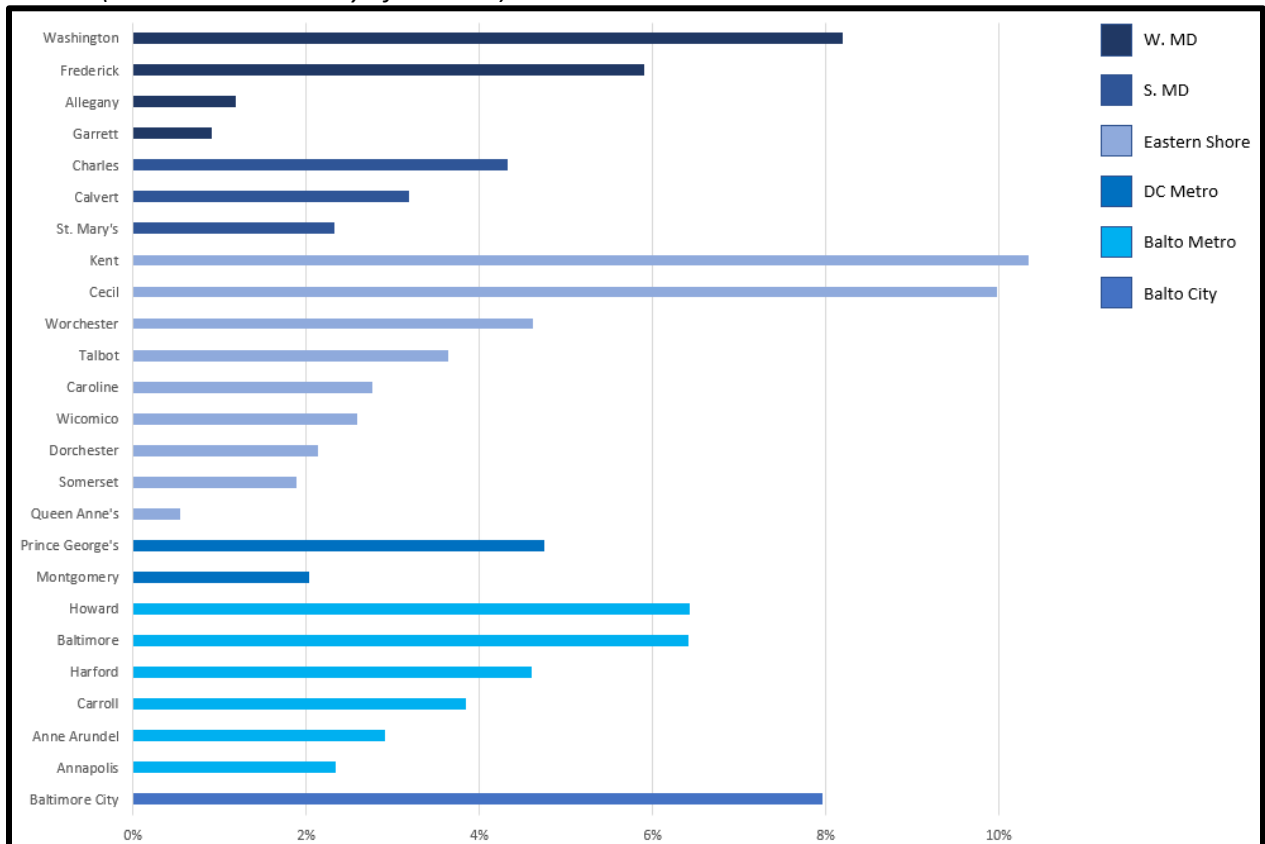
While most EMS incidents result in a transport to an ED, sometimes the patient refuses to be transported, especially when EMS services were requested for them by others – rather than the patient calling EMS for themselves. The two counties with the highest refusal rates were Kent and Cecil Counties, both located in the Eastern Shore Region (10%, n=345, and 10%, n=1,607 respectively). Washington County located in the Western Region had the third highest rate, followed by Baltimore City (8%, n=2,416, and 8%, n=7,395 refusals respectively). It is important to note that these aforementioned more rural areas also have zip codes with some of the highest 9-1-1 utilization for BH-crisis, as well as some of the highest burden of ED utilization for BH-crisis. A number of reasons may account for why the refusal rate appears to be higher in some of the more rural areas including stigma, lack of transportation

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back from hospitals, as well as other factors. Understanding the factors underlying refusal rates will be an essential component to assuring that all of those in crisis receive the care needed.

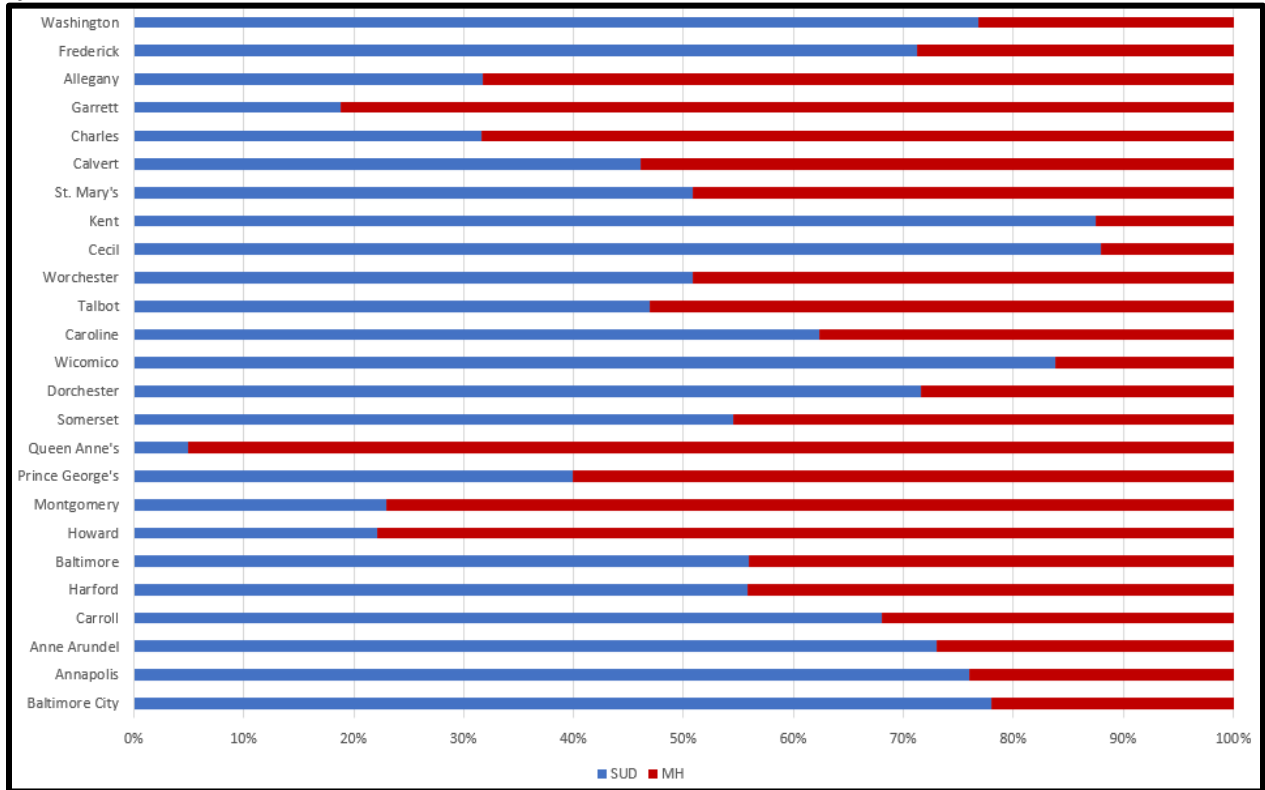
Analysis of difference in refusal rates between SUD and MHD show some unique patterns. Counties with the highest overall rates of refusals (Cecil, Kent, Washington, and Baltimore) had some of the highest ratios of SUD to MHD refusals. Wicomico County is a notable exception to this trend.

Figure 1.F.1 Percentage of all 9-1-1 calls for BH-crisis for which transportation was refused, by county, CY2019 (eMEDS data courtesy of MIEMSS).



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Figure 1.F.2 Proportion of 9-1-1 transports refused: MHD vs SUD, by county, CY2019 (eMEDS data courtesy of MIEMSS).



**Research Question 1.G: Are there differences in the frequency of EMS utilization for BH-crisis by time of day or day of the week? Are there differences in call frequency by MHD or SUD-crisis?**

***Time of Day***

Of all of the data used in this analysis, the EMS dataset was the only one with information related to the time of day an event occurred. The Department used this information to analyze whether there were differences in the demand for crisis services over the course of the day, or by day of the week. The vast majority of calls for BH-crisis occur between 9 am and 2 am (80%) with call frequency peaking between the hours of 2-10 pm (see Figure 1.G.1 for additional information. While there is some slight difference in the timing of EMS calls throughout the day by urban versus rural regions, it is not substantial.

When calls were broken out by SUD-crisis and MHD-crisis, two distinct patterns emerged (see Figure 1.G.2.) Calls for MHD-crisis transportation begin increasing much earlier in the day than SUD-crisis calls, beginning to markedly increase at 8am, plateauing around noon and then beginning to taper off starting around 10 pm. Whereas calls for SUD-crisis being increasing much later in the day with a marked increase around 11 am, peaking between 6 pm and 10 pm and then tapering off throughout the rest of the day. This information can be used to inform staffing needs as the state moves to expand crisis services.

***Day of Week***

There are slight differences in the frequency of EMS calls for BH-crisis transports by day of the week (see Figure 1.G.3). When frequency of calls for SUD-crisis and MHD-crisis were compared by day of the week, a distinctive pattern emerged. MH transports are higher at the beginning of the week (Monday, and Tuesday) whereas transportation requests for SUD-crisis increased later in the week starting on Thursday and peaking on Saturday. (see Figure 1.G.4) There was no significant difference when looking at time of week by urban versus rural regions of the state.

As the state seeks to expand to provide crisis services a number of options are available for phased in approaches including 16/7 models, 24/7 models as well as schedules that exclude weekends. Patterns in this data should be used in the planning of crisis expansion. This analysis is limited to a lack of information regarding time of arrival at EDs by persons who access the ED by modes of transportation other than EMS for BH-crisis. Additional information gathered from EDs regarding these patterns in use could be valuable for the purpose of planning.



Figure 1.G.1 Frequency distribution of EMS-calls for BH-crisis, by time of day, CY2019 (eMEDS data courtesy of MIEMSS).

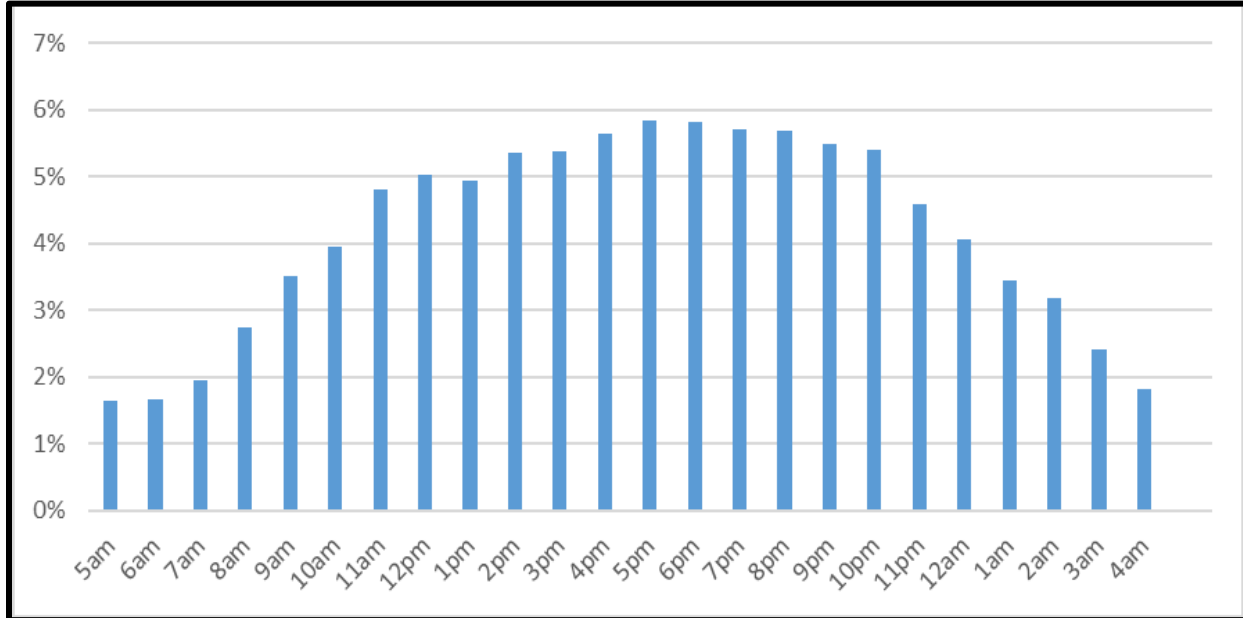


Figure 1.G.2 Comparison of the frequency distributions of EMS-calls for MHD vs. SUD crisis, by hour of the day, CY2019 (eMEDS data courtesy of MIEMSS).

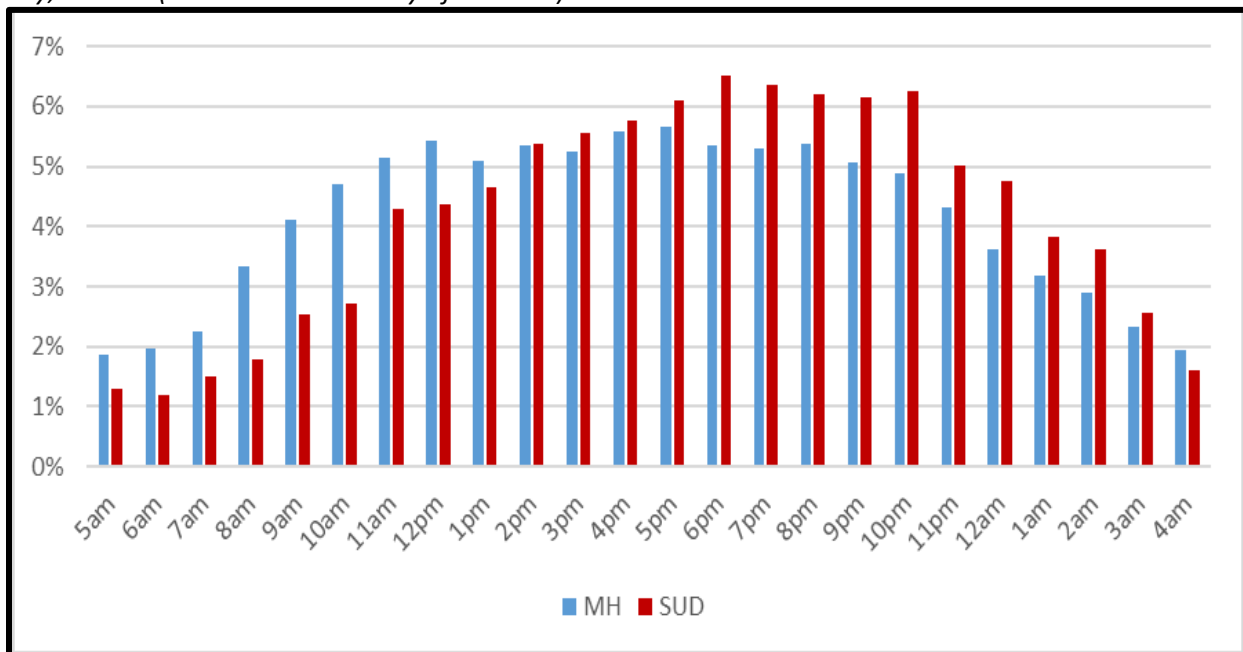


Figure 1.G.3 Frequency distribution of EMS calls for BH-crisis, by day of the week, CY2019 (eMEDS data courtesy of MIEMSS).

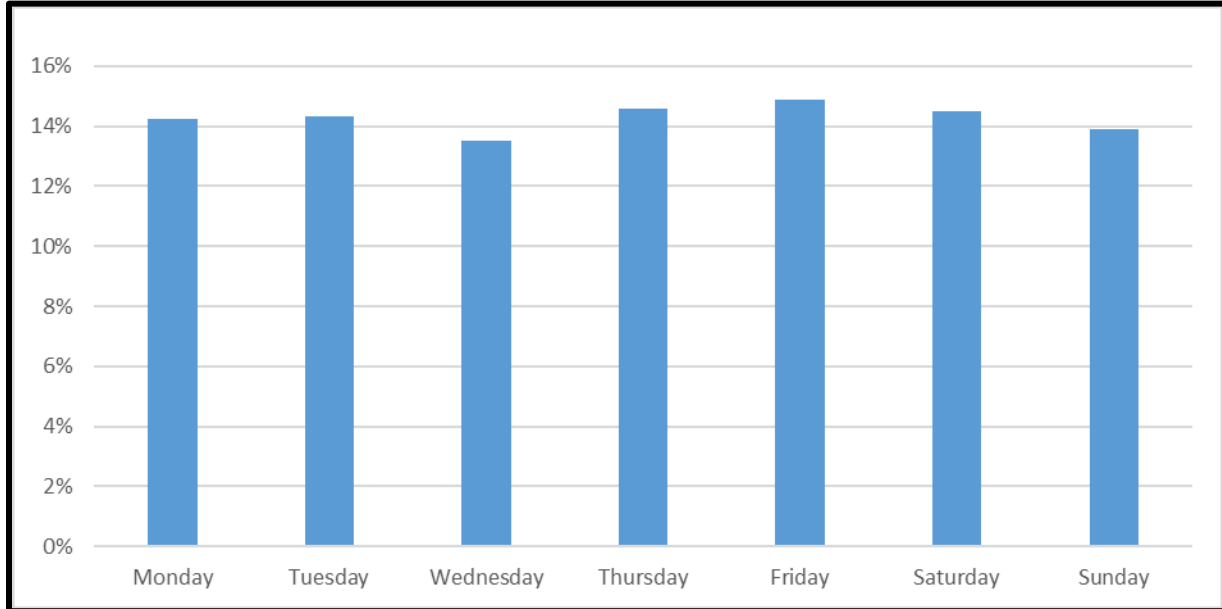
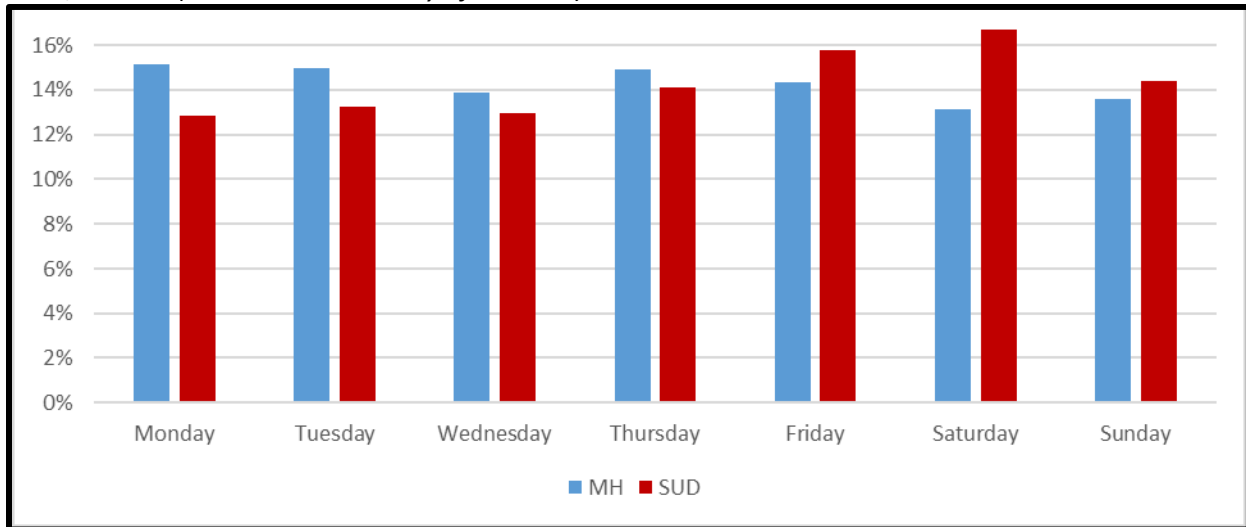


Figure 1.G.4 Comparison of the frequency distributions of EMS calls for MHD and SUD-crisis by day of week, CY2019 (eMEDS data courtesy of MIEMSS).



## Primary Aim 2

### Research Question 2.A: What proportion of Medicaid beneficiaries seen in the ED for BH crisis are subsequently admitted for inpatient care – are there differences across the state in admission rates?

The proportion of adult Medicaid beneficiaries seen in the ED for BH-crisis, who were subsequently admitted for inpatient care, varied by region. The D.C. Metro and Western Maryland regions had the highest admission rates (27% and 23% respectively). The two regions with the lowest admission rates included Baltimore City and the Eastern Shore (see Figure 2.A.1 for additional information).

Disaggregating by county shows substantial differences by county with Montgomery and Prince George's county having the highest admission rates from the ED for BH-crisis (28% and 27% respectively) and counties located in the Eastern Shore (including Talbot, Queen Anne's, and Caroline) with some of the lowest admission rates (see Figure 2.A.2 for additional information). Baltimore City had one of the lower admission rates as well.

Not all counties have a hospital, and even those counties with hospitals may not have hospitals licensed to provide inpatient psychiatric care; therefore, variability in admission rates should be interpreted carefully. There may also be other factors influencing admission rates including the availability of programs offering partial hospitalization, day programs, supportive housing, and other resources such as residential crisis beds.

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Figure 2.A.1 Percentage of Medicaid beneficiaries who were seen in the ED for BH-crisis and subsequently admitted, by region, CY2019 (MMIS Claims data, licensing information courtesy of OHCQ).

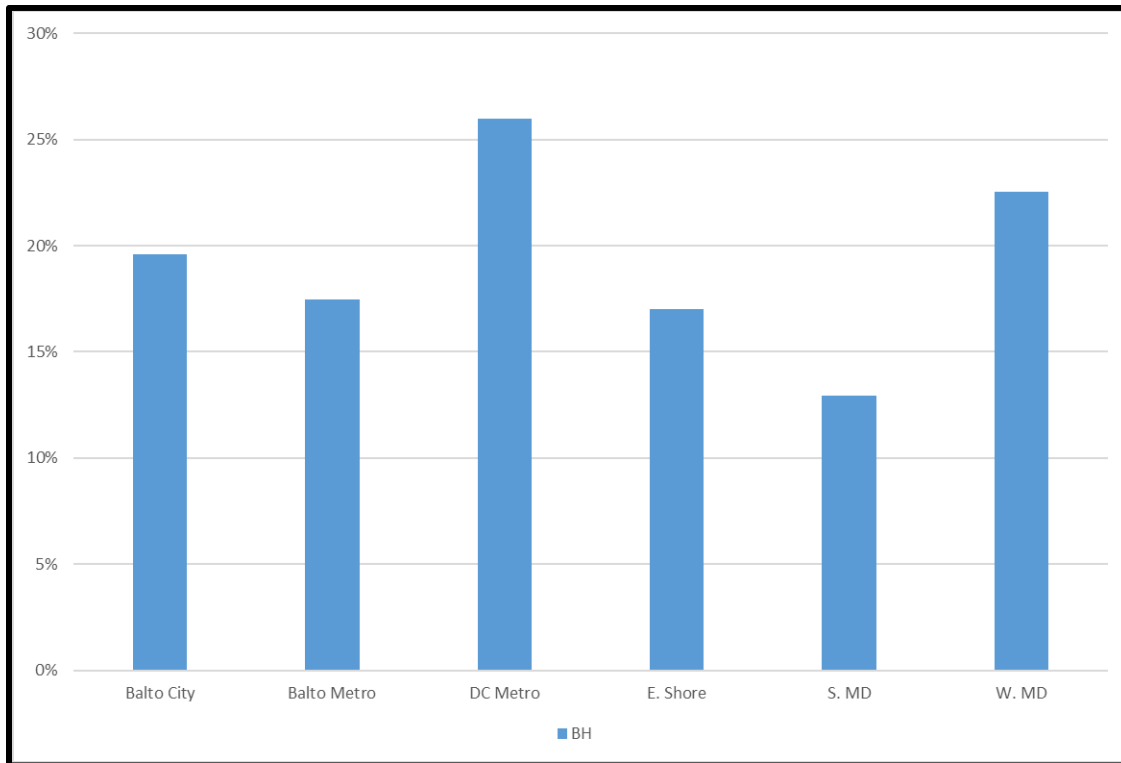
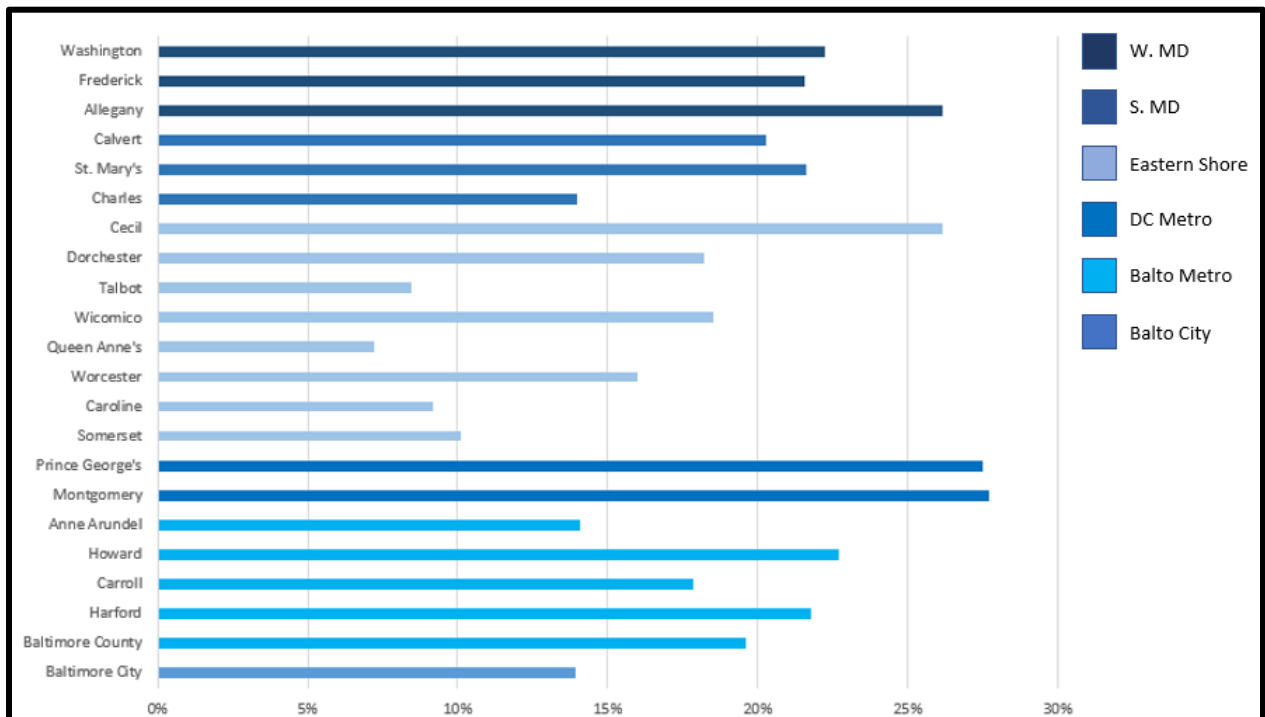


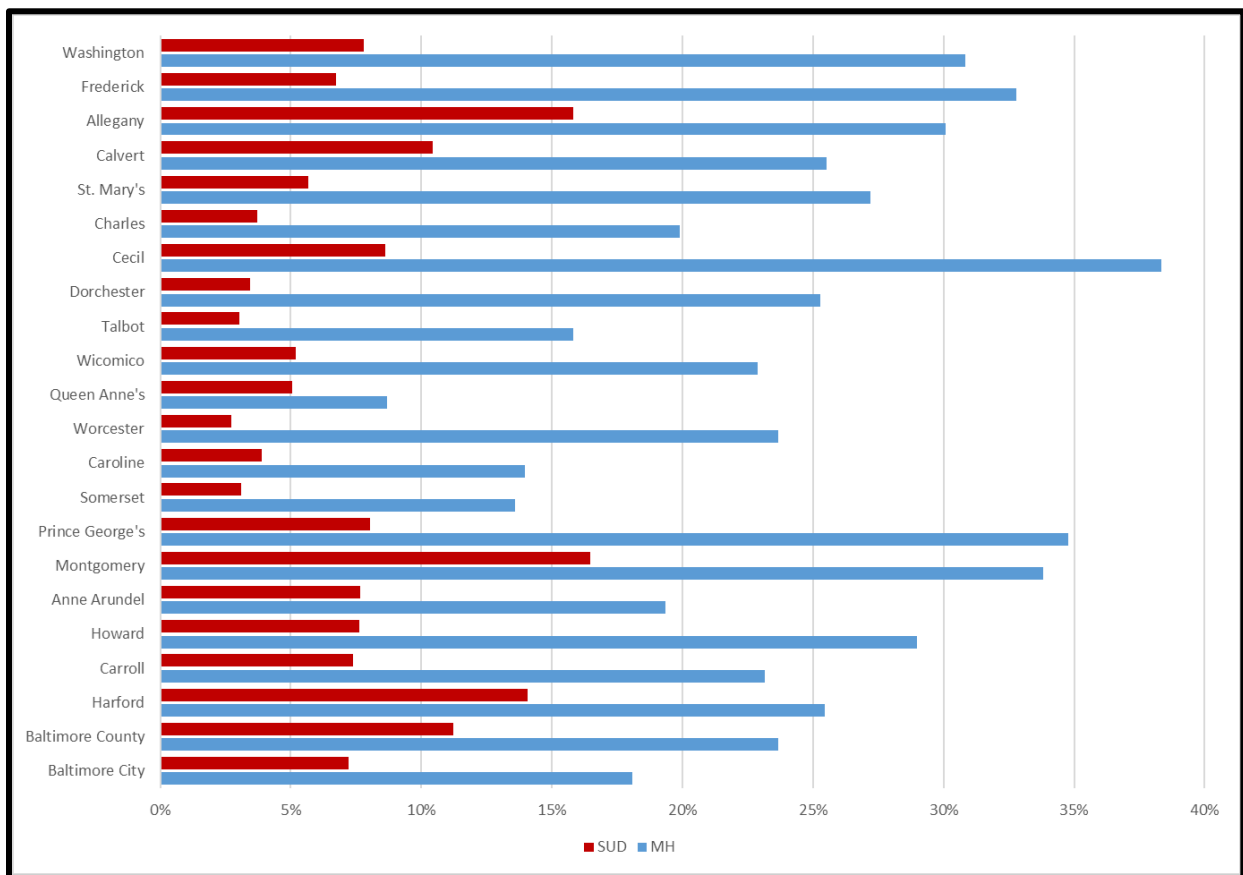
Figure 2.A.2 Percentage of Medicaid beneficiaries who were seen in the ED for BH-crisis and subsequently admitted, by county, CY2019 (MMIS Claims data, licensing information courtesy of OHCQ).



**Research Question 2.B: Are there differences in admission rates from the ED for Medicaid beneficiaries with SUD or MHD-crisis?**

Medicaid beneficiaries who were seen in the ED for an MHD-crisis were twice as likely to be admitted for inpatient care as those seen for SUD-crisis. Cecil County had the highest admission rates from the ED for MDH-crisis followed by Prince George’s and Montgomery Counties (38%, 35%, and 34% respectively). (see Figure 2.B.1) Counties with the highest admission rates for persons seen in the ED for SUD-crisis included Allegany, Montgomery, and Harford Counties, whereas the lowest admission rates for SUD-crisis were observed in the smaller rural counties. Differences in admission rates by SUD or MHD-crisis are based in many factors including the needs of the population using the ED, local the presence of local resources that allow persons to remain in the community, as well as other factors. Admission rates should be considered in the planning and evaluation of any expanded crisis models the state pursues.

*Figure 2.B.1 Comparison of rates of admission for Medicaid beneficiaries seen in ED for MHD vs. SUD-crisis, by county, CY2019 (MMIS Claims data, licensing information courtesy of OHCQ).*

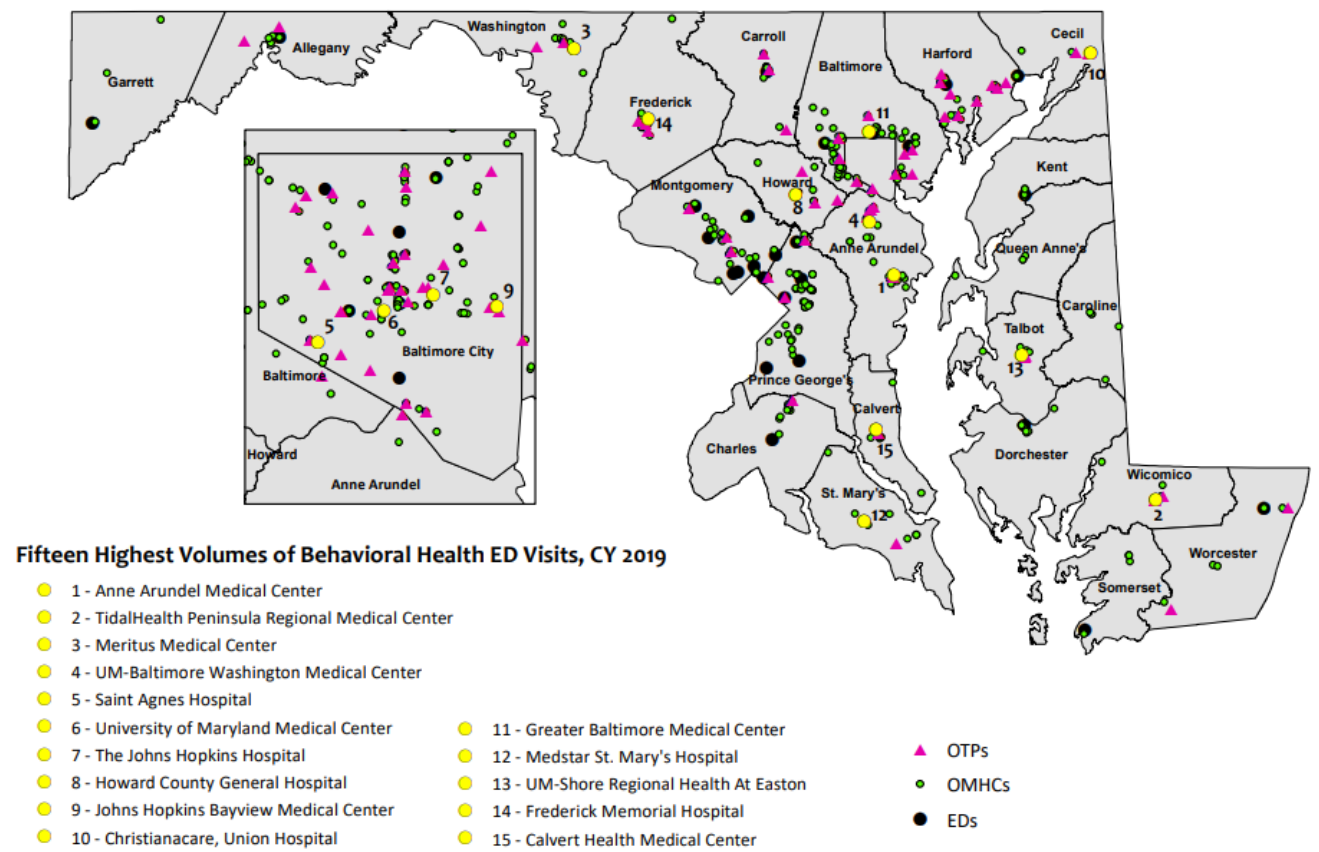


### Primary Aim 3

**Research Question 3.A:** How is the distribution of OMHCs aligned with the distribution of hospitals with high volume ED utilization for BH-crisis? Are there differences in alignment by utilization of EDs for MHD or SUD-crisis?

OMHCs are well distributed throughout the state and concentrated in the parts of the state with the highest populations. These providers tend to also be co-located with major lines of transportation (see Figure 3.A.1 for additional details). OTPs are also well distributed and overlap substantially with OMHCs, however, there are fewer OTPs in the state, with multiple counties lacking an OTP. Hospitals are as less equally distributed throughout the state, with higher concentrations near urban areas. It is interesting to note that in Montgomery and Prince George’s county there are a large number of hospitals, but none of them is in the top fifteen in the state for ED volume for BH-crisis. This may be related to additional community-based infrastructure in the local area. When ED use for BH-crisis was broken out into ED use for SUD and MDH-crisis, there were no substantial differences observed in provider alignment patterns.

Figure 3.A.1 Location of OMHCs, OTPs, by Hospitals with the highest volumes of utilization for persons experiencing BH crisis (HSCRC All-Payer Casemix data, BHA and MATOD licensing data).



**Research Question 3.B: How is the distribution of OMHCs aligned with the distribution of 9-1-1 calls for BH crisis – are there differences by MHD or SUD?**

The areas of Maryland with the highest number of 9-1-1 calls for BH-crisis in CY 2019 were for the most part well aligned with areas with the highest concentrations of OMHCs, OTPs, and EDs. There are some notable exceptions in rural areas where the concentration of outpatient providers does not match the need demonstrated by 9-1-1 call volume for BH-crisis. Figures 3.B.1, B.2 and B3 provide additional information regarding these distributions.

Figure 3.B.1 GIS map of the distribution of OMHCs, OTPs and Hospitals, by frequency of 9-1-1 calls for BH-crisis at the zip code level, CY2019 (HSCRC All-Payer Casemix data, BHA and MATOD licensing data, eMEDs data courtesy of MIEMSS).

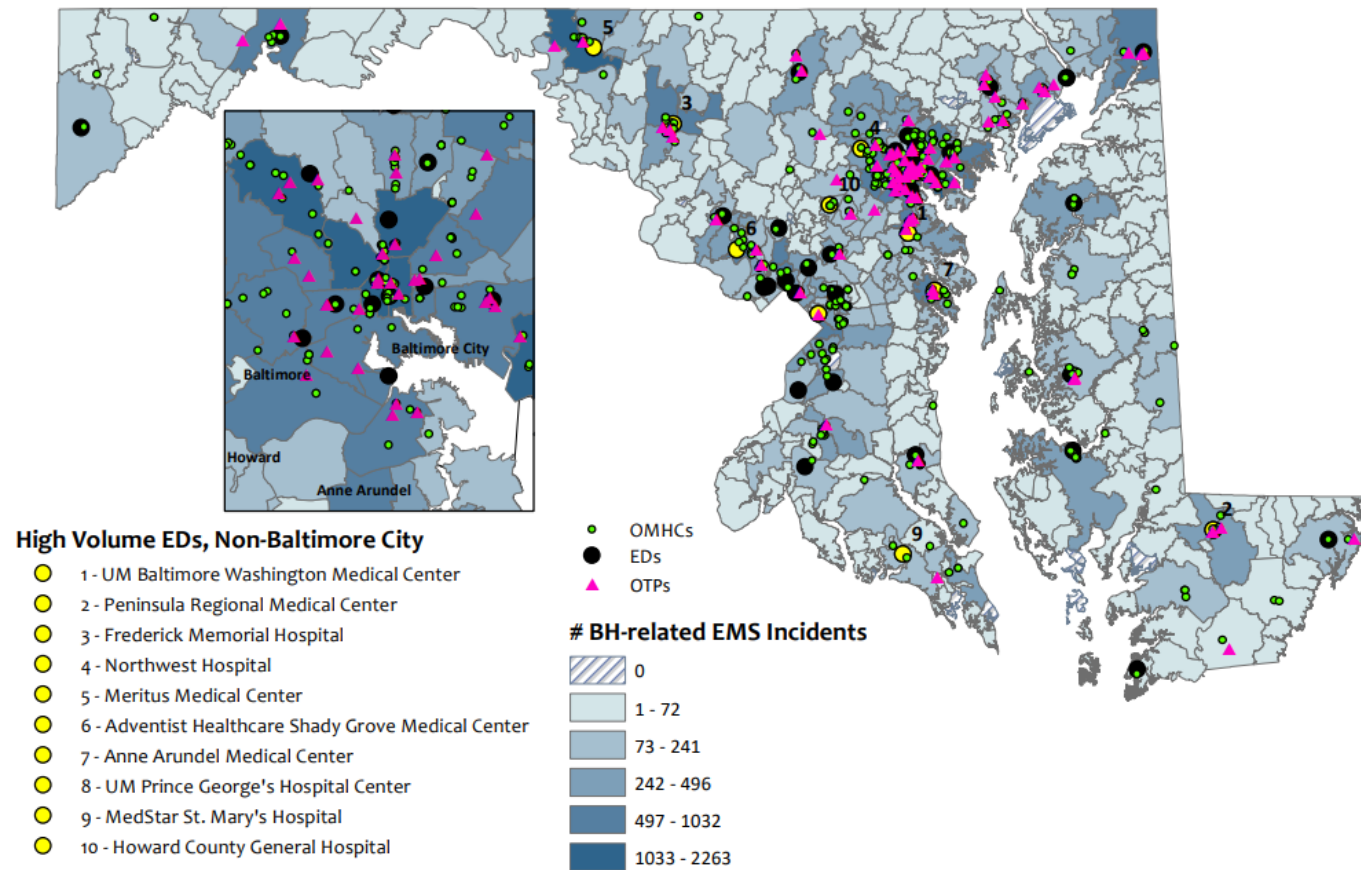


Figure 3.B.2 GIS map of the distribution of OMHCs, OTPs and Hospitals, by frequency of 9-1-1 calls for MHD-crisis at the zip code level, CY2019 (HSCRC All-Payer Casemix data, BHA and MATOD licensing data, eMEDs data courtesy of MIEMSS).

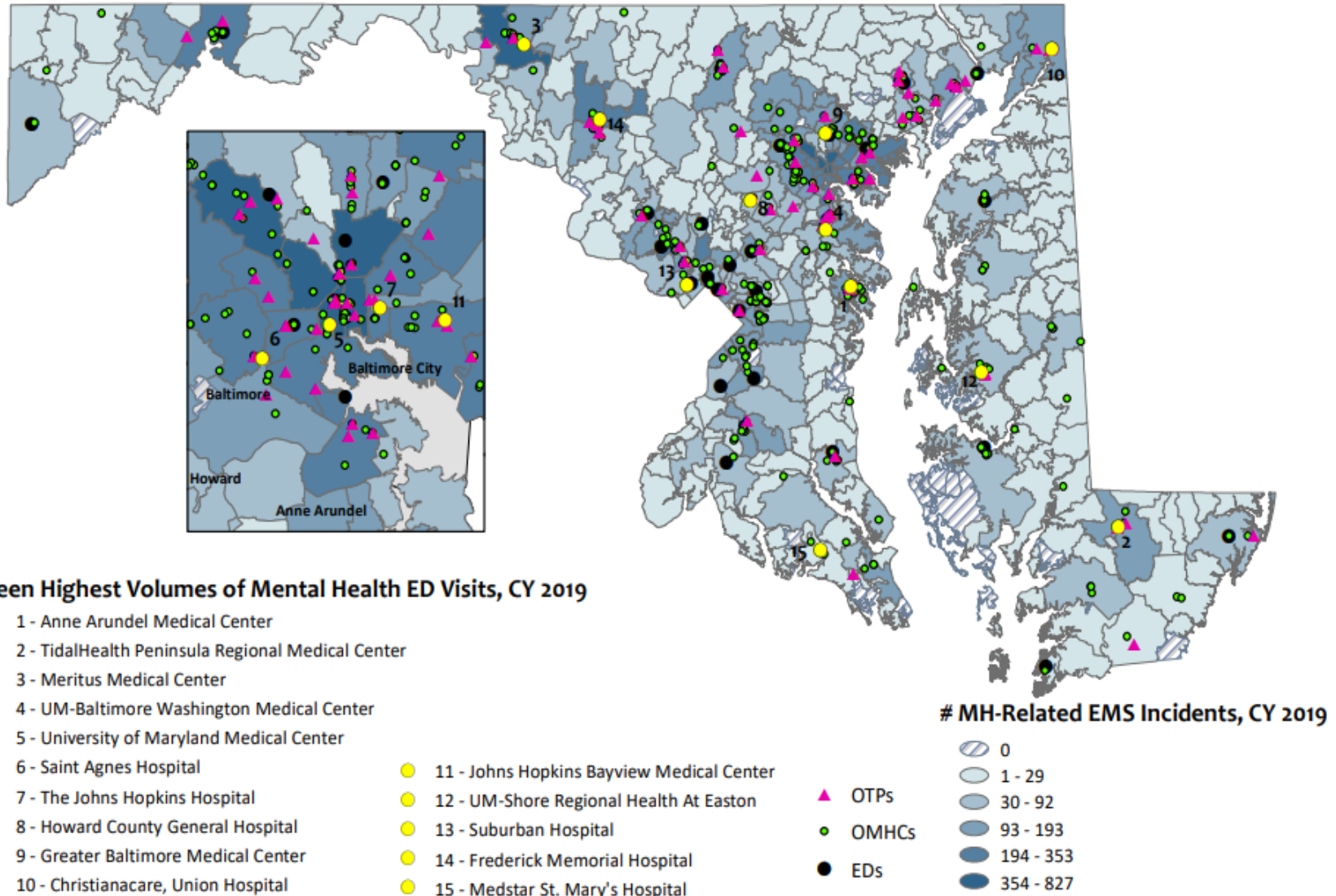
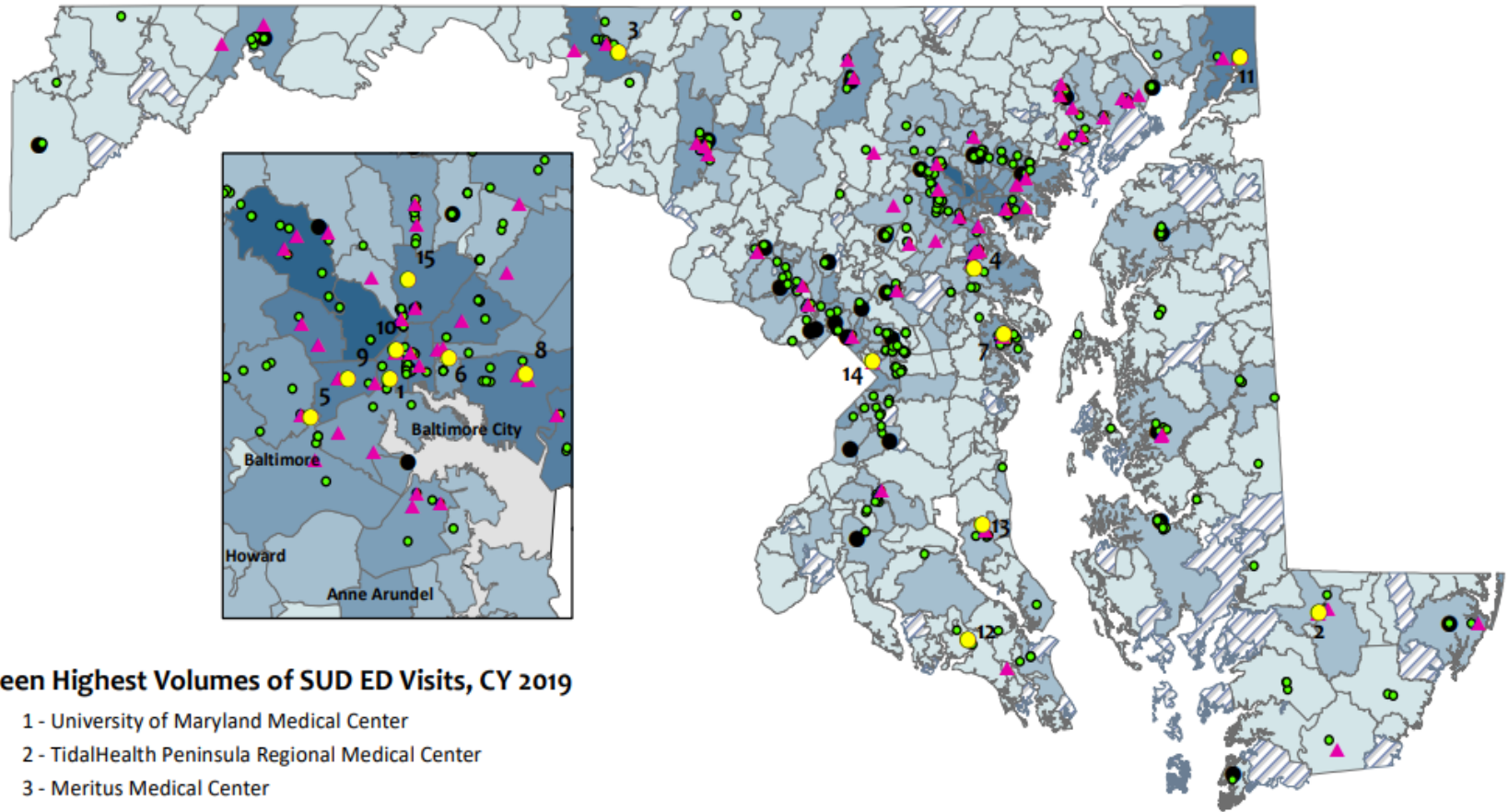




Figure 3.B.3 GIS map of the distribution of OMHCs, OTPs and Hospitals, by frequency of 9-1-1 calls for SUD-crisis at the zip code level, CY2019 (HSCRC All-Payer Casemix data, BHA and MATOD licensing data, eMEDs data courtesy of MIEMSS).



**Fifteen Highest Volumes of SUD ED Visits, CY 2019**

- 1 - University of Maryland Medical Center
- 2 - TidalHealth Peninsula Regional Medical Center
- 3 - Meritus Medical Center
- 4 - UM-Baltimore Washington Medical Center
- 5 - Saint Agnes Hospital
- 6 - The Johns Hopkins Hospital
- 7 - Anne Arundel Medical Center
- 8 - Johns Hopkins Bayview Medical Center
- 9 - Grace Medical Center
- 10 - UMMC Midtown Campus
- 11 - Christianacare, Union Hospital
- 12 - Medstar St. Mary's Hospital
- 13 - Calvert Health Medical Center
- 14 - UM-Prince George's Hospital Center
- 15 - Medstar Union Memorial Hospital

**# SUD-Related EMS Incidents, CY 2019**

- ◌ 0
- ◌ 1 - 23
- ◌ 24 - 85
- ◌ 86 - 243
- ◌ 244 - 539
- ◌ 540 - 949
- ▲ OTPs
- OMHCs
- EDs

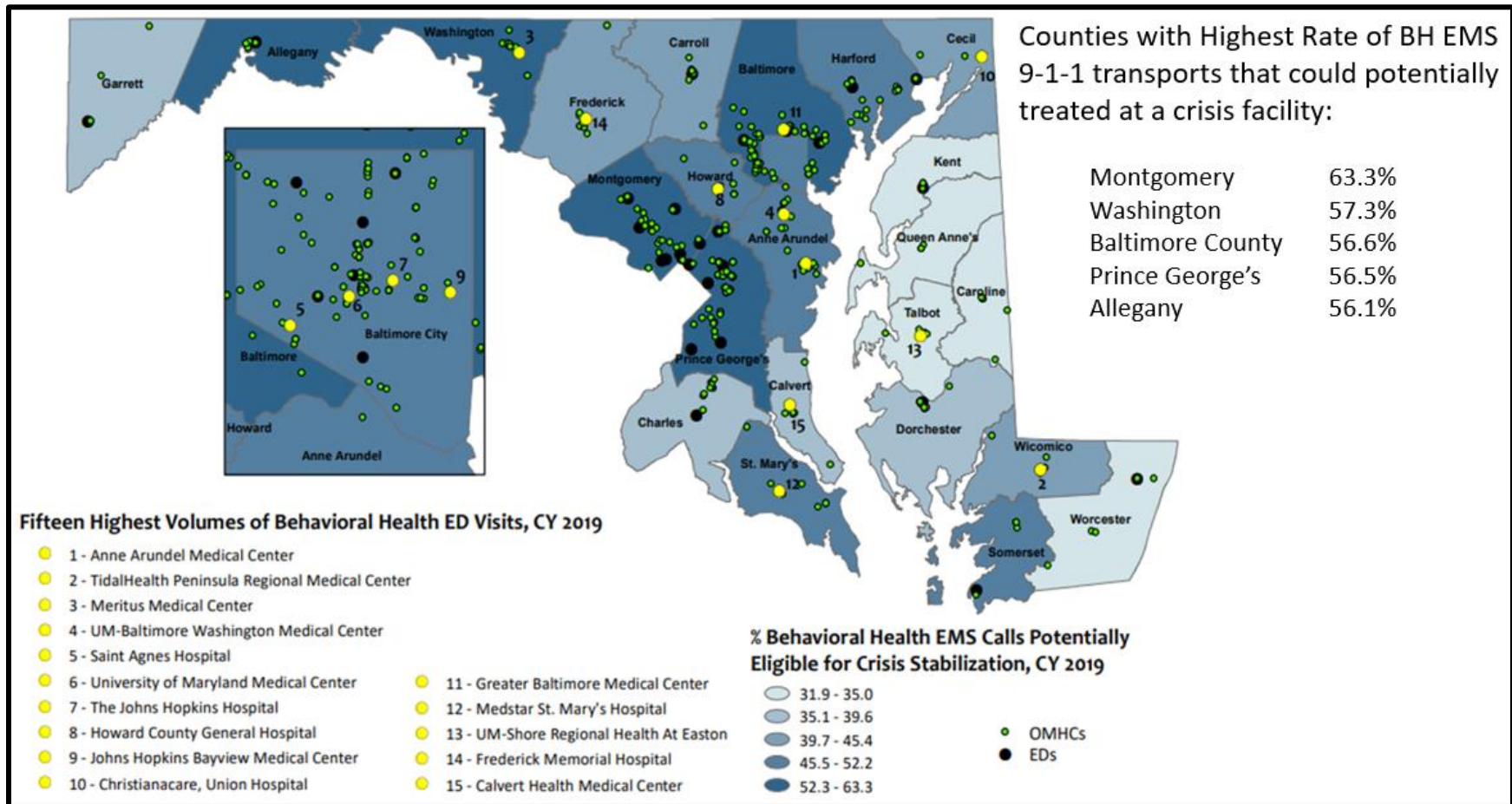
## Primary Aim 4

**Research Question 4.A: What proportion of 9-1-1 for BH-crisis could have been safely treated at an outpatient crisis facility if it were available? Are there differences by region, MHD or SUD-crisis calls?**

Once the algorithm identifying persons who could have been served in a crisis stabilization facility – as opposed to an ED – was applied to the eMEDs data for CY2019, the Department was able to determine the proportion of calls on a per-county basis that would have been eligible for transportation to a crisis service provider if one had been available. Montgomery, Washington, Baltimore County, Prince George’s, and Alleghany County had the highest rates of 9-1-1 calls for BH-crisis that would have qualified for transportation to a crisis stabilization facility (63%, 57%, 57%, 57%, and 56% proportion of calls respectively).

Many of the areas identified as having a high proportion of calls eligible for transportation to a crisis provider overlap with areas of the state with the highest numbers of persons who refused to be transported to the ED for BH-crisis. Information like this can be used to help the state in its planning of how to expand to provide a comprehensive network of crisis providers tailored to meet the needs of Marylanders. Figure 4.A.1 provides additional detail on this topic.

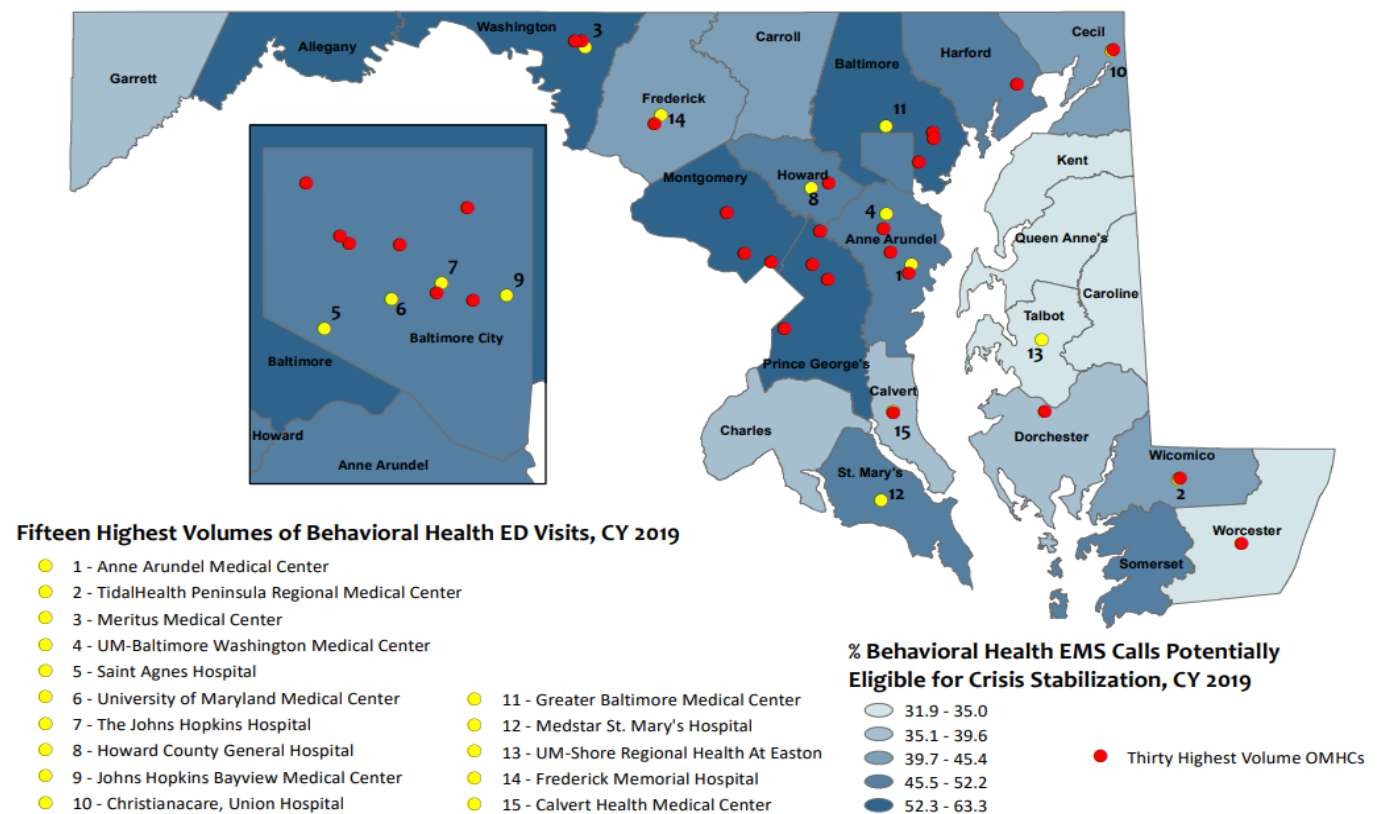
Figure 4.A.1. GIS map of the distribution of high volume OMHCs and Hospitals, by the frequency distribution of 9-1-1 calls for BH-crisis that were potentially eligible for transportation to a crisis service provider as opposed to an ED, CY2019 (HSCRC All-Payer Casemix data, BHA licensing data, eMEDs data courtesy of MIEMSS).



**Research Question 4.B:** How does the distribution of OMHCs align with the proportions of persons in BH crisis using EMS who could be treated in a crisis facility if it were available?

Hilltop identified the thirty highest volume OMHCs and created a GIS map including these providers and frequency BH-crisis calls eligible for transportation to a crisis facility by county of origin. The resulting map in Figure 4.A.1 demonstrates that while these high volume OMHCs are well positioned to expand and provide crisis services to the majority of persons calling 9-1-1 for BH-crisis that would have been eligible for transportation to a crisis provider, the more rural areas of the state may lack sufficient numbers of providers with the capacity to expand to provide these services (see Figure 4.A.1). As the state continues to evaluate models for expansion, these issues surrounding underlying capacity should be considered.

*Figure 4.B.1 High Volume OMHCs, EDs, and the Percentage of BH EMS Calls That Could Potentially Be Diverted to Crisis Stabilization Centers, by county (eMEDS).*



## Section 4: Conclusions

### ***State-Wide Trends***

Across Maryland, ED utilization for BH-crisis varied by county, region and even zip code. However, there are some state-wide trends of note. First, when examining the proportion of ED walk-in patients versus EMS transported patients, the data show a substantially greater number of people use their own form of transportation to access the ED, as opposed to calling 9-1-1 in order to access acute care for BH-crisis. The fact that a significant number of patients find independent means of transportation to EDs will need to be taken into consideration in the planning and engagement of communities as crisis services are expanded state-wide. This analysis also demonstrated that in general, there are more 9-1-1 calls for MHD-crisis than SUD-crisis. Any plans to expand OMHCs to provide crisis services must take these needs into account. Lastly, 9-1-1 utilization for BH-crisis varies in distinct patterns during the day, as well as by day of the week, and these patterns were observed in both urban and rural areas. Stakeholders should consider the most effective hours of operation based on this utilization data in order to service the greatest number of patients. The Department found that 81% 9-1-1 calls for BH-crisis occurred between 8AM and 1AM. If the state chooses to expand in a phased fashion with 16/7 models leading into fully operational 24/7 models, these patterns of utilization can be used to guide hours of operation.

### ***Regional Differences in ED Burden***

ED utilization for BH-crisis care varies by region. EDs located in the Eastern Shore Region have the highest proportion of ED utilization for BH-crisis in Maryland. County-level regarding the types of care (MDH vs. SUD-crisis) sought in EDs provides important insight into the variation in local needs, and thus the types of services should be enhanced in a new or expanding CSC networks. In Somerset County, for example, nearly 80% of the BH ED visits are for SUD, whereas in Howard County, only 33% of BH-crisis were SUD related (HSCRC All-Payer Casemix Data).

EDs are ill equipped to provide care for persons in BH-crisis, leading to long wait times, and poor patient outcomes.<sup>6</sup> However; many patients either do not have access to other types of care – or – are not connected with care they could access; therefore despite not receiving the care they need, they utilize the ED multiple times a year for BH-crisis. In some areas of the state, this issue is more pronounced than others. For example, Baltimore City, a County with a population 3.5 times smaller than the surrounding metro area, sees not only a greater number of patients in their EDs for BH-crisis; but also a higher proportion of persons using the ED for BH-crisis multiple times a year their metro counterpart. This is particularly true for those persons who seek care more than 10-times a year in an ED for BH-crisis. Other than Baltimore City, the Western Region of Maryland has proportionally more patients with two or more visits than all other regions. Expanding OMHCs to provide crisis services could not only meaningfully reduce the burden on EDs, LE, and EMS, but also greatly improve health outcomes among these populations.

### ***Differences in 9-1-1 use for BH-crisis***

EMS calls for any BH condition in CY2019 tended to be concentrated in the high-population areas of the state, however, there were notable exceptions to this trend, with certain rural zip codes demonstrating high need in Allegany, Washington, and Cecil County.

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<sup>6</sup> [Hospitals Are Ill Equipped To Treat Behavioral Health](#)

While most 9-1-1 calls for BH-crisis result in a transport to an ED (90%), sometimes the patient refuses to be transported, especially when EMS was called for the person as opposed by the person. The data shows that Kent and Cecil Counties in the Eastern Shore Region, Washington County in the Western Region, and Baltimore City had the highest number of transport refusals. In addition, in all three counties refusals shared a common pattern in that a substantially higher proportion of the refusal for transportation calls were for SUD as opposed to MHD-crisis. Various factors may influence a person's choice to refuse transport to the ED for a BH-crisis including fear of: being labeled an addict; facing criminal charges; or being forcibly admitted to a care unit. It is possible that once CSFs are in place as alternative destinations to the ED, populations who previously refused transport may be more willing to access care at CSFs.

### ***Admission rates from ED for Medicaid beneficiaries in BH crisis***

There is substantial variation by region in the proportion of persons admitted from the ED to inpatient care for BH-crisis (15% - 30%). Admission rates also differed by type of BH-crisis (MHD vs. SUD) with persons seen for MHD-crisis admitted at more than two times the rate of persons seen for SUD-crisis. When population-adjusted rates of admission were compared, Baltimore City, the Eastern Shore Region, and the Baltimore Metro Region had the lowest admissions rate for MHD and SUD. Given that there is no indication that these populations have a lower burden of BH need, these differences should be considered in the overall planning and scoping of additional crisis care expansion statewide.

### ***Alignment of BH-crisis needs with Acute Care and Outpatient Provider Networks***

GIS mapping indicates that community based behavioral health provider networks are generally co-located with acute care networks and population centers. Some rural regions of the state have a limited number of both outpatient as well as acute care BH providers. When provider networks are compared to zip-code level maps of EMS 9-1-1 calls for BH, it is clear that there is substantial overlap between the need (as measured by 9-1-1 calls and high-volume ED use for BH-crisis) and outpatient BH provider locations. Stakeholders have voiced concerns that if CSFs are located too far away from EDs that it will be difficult for populations to shift utilization patterns, as well as cumbersome for LE and EMS to integrate these spaces into their workflows. The Department's findings that there are many outpatient providers in close proximity to the acute care providers currently caring for persons in BH-crisis lends credence to the feasibility of expanding OMHCs expanding to provide crisis services.

### ***Proportion of persons in crisis currently seeking care in EDs who could be treated in CSFs***

Analysis of the proportion of EMS 9-1-1 calls for BH-crisis that would have been eligible for transportation to a crisis center determined that a substantial proportion – up to 63% in some counties – of persons who called 9-1-1 for a BH-crisis met the clinical criteria for transportation to a CSF had it been available (range: 32 – 63%). The Eastern Shore and Western Regions of Maryland have some of the highest proportions of persons who clinically qualified for transportation to a crisis facility based on the department's analysis; however, these areas of the state also have some of the lowest concentrations of outpatient behavioral health providers. These findings suggest that: substantial proportion persons seeking BH-crisis care from acute care providers (EMS and EDs) could be safely provided care in CSFs were they available; and, in many regions of the state there are robust provider networks in close proximity to current acute care providers that could be leveraged to expand to provide crisis services. However, in some areas of the state with the greatest need for additional community-based crisis care there are a limited number of providers who may have the capacity to expand to meet this need.

## Appendix A: Mental Health Disorder ICD 10 Diagnosis Codes

Behavioral Health Classification	ICD-10 Code	Description
MHD	F200-203	Paranoid schizophrenia; disorganized schizophrenia; Catatonic schizophrenia; undifferentiated schizophrenia
MHD	F205	Residual schizophrenia
MHD	F2081	Schizophreniform disorder
MHD	F2089	Other schizophrenia
MHD	F209	Schizophrenia, unspecified
MHD	F21-24	Schizotypal disorder; Delusional disorders; Brief psychotic disorder; Shared psychotic disorder
MHD	F250	Schizoaffective disorder, bipolar type
MHD	F251	Schizoaffective disorder, depressive type
MHD	F258	Other schizoaffective disorders
MHD	F259	Schizoaffective disorder, unspecified
MHD	F28-29	Other psychotic disorder not due to a substance or known physiological condition; Unspecified psychosis not due to a substance or known physiological condition
MHD	F301-304	Manic episode (varied levels of severity)
MHD	F308-309	Other manic episodes; Manic episode, unspecified
MHD	F310-319	Bipolar disorders
MHD	F320-334	Major depressive disorders
MHD	F338-341	Other recurrent depressive disorders; Major depressive disorder, recurrent, unspecified; Cyclothymic disorder; Dysthymic disorder
MHD	F348-349	Other persistent mood (affective) disorders; Persistent mood (affective) disorder, unspecified
MHD	F39	Unspecified mood (affective) disorder
MHD	F40-45	Phobic anxiety disorders; Other anxiety disorders; Obsessive-compulsive disorder; Reaction to severe stress, and adjustment; Dissociative and conversion disorders; Somatoform disorders;
MHD	F48	Depersonalization-de-realization syndrome
MHD	F50	Eating disorders
MHD	F53-54	Puerperal psychosis; Psychological and behavioral factors associated with disorders or diseases classified elsewhere
MHD	F60	Specific personality disorders
MHD	F63-66	Impulse disorders; Gender identity disorders; Paraphilias; Other sexual disorders
MHD	F68-69	Other disorders of adult personality and behavior; Unspecified disorder of adult personality and behavior
MHD	F843	Other childhood disintegrative disorder
MHD	F900-902	Attention-deficit hyperactivity disorder, predominantly inattentive type; Attention-deficit hyperactivity disorder, predominantly hyperactive type; Attention-deficit hyperactivity disorder, combined type
MHD	F908-913	Attention-deficit hyperactivity disorder, other type; Conduct disorder; Oppositional defiant disorder
MHD	F918-919	Other conduct disorders; Conduct disorder, unspecified
MHD	F930	Separation anxiety disorder of childhood
MHD	F938-942	Other childhood emotional disorders; Childhood emotional disorder, unspecified; Selective mutism; Reactive attachment disorder of childhood; Disinhibited attachment disorder of childhood

## Appendix B: Substance Use Disorder ICD 10 Diagnosis Codes

Behavioral Health Classification	ICD-10 Code	Description
SUD	F10	Alcohol abuse
SUD	F11	Opioid abuse
SUD	F12	Cannabis abuse
SUD	F13	Sedative, hypnotic or anxiolytic abuse
SUD	F14	Cocaine abuse
SUD	F15	Other stimulant abuse
SUD	F16	Hallucinogen abuse
SUD	F17	Nicotine dependence
SUD	F18	Inhalant abuse
SUD	F19	Other psychoactive substance abuse
SUD	099310	Alcohol use complicating pregnancy, unspecified trimester
SUD	099311	Alcohol use complicating pregnancy, first trimester
SUD	099312	Alcohol use complicating pregnancy, second trimester
SUD	099313	Alcohol use complicating pregnancy, third trimester
SUD	099314	Alcohol use complicating childbirth
SUD	099315	Alcohol use complicating the puerperium
SUD	099320	Drug use complicating pregnancy, unspecified trimester
SUD	099321	Drug use complicating pregnancy, first trimester
SUD	099322	Drug use complicating pregnancy, second trimester
SUD	099323	Drug use complicating pregnancy, third trimester
SUD	099324	Drug use complicating childbirth
SUD	099325	Drug use complicating the puerperium
SUD	R780	Finding of alcohol in blood
SUD	R781	Finding of opiate drug in blood
SUD	R782	Finding of cocaine in blood
SUD	R783	Finding of hallucinogen in blood
SUD	R784	Finding of other drugs of addictive potential in blood
SUD	R785	Finding of other psychotropic drug in blood



## Appendix C: New Self-Poisoning Diagnosis Codes for Addition to Behavioral Health Definition

Behavioral Health Classification	ICD-10 -CM	Description
SUD	T400X2A -T405X2A	Poisoning by narcotics, intentional self-harm
SUD	T40602A	Poisoning by unspecified narcotics, intentional self-harm
SUD	T40692A	Poisoning by other narcotics, intentional self-harm
SUD	T407X2A -T40992A	Poisoning by psychedelics, intentional self-harm
SUD	T410X2A -T415X2A	Poisoning by inhaled anesthetics, intentional self-harm
SUD	T423X2A -T4272XA	Poisoning by sedative- hypnotic, intentional self-harm
SUD	T43622A -T4392XA	Poisoning by psychotropic drugs, not elsewhere classified, intentional self-harm
SUD	T472X2A -T474X2A	Poisoning by agents primarily affecting the gastrointestinal system, intentional self-harm
SUD	T360X2A -T369X2A	Poisoning by systemic antibiotics, intentional self-harm
SUD	T370X2A - T3792XA	Poisoning by other systemic anti-infectives and antiparasitics, intentional self-harm
SUD	T380X2A - T387X2A	Poisoning by hormones and their synthetic substitutes and antagonists, intentional self-harm
SUD	T38802A - T38992A	Poisoning by hormones and their synthetic substitutes and antagonists, intentional self-harm
SUD	T39012A	Poisoning by aspirin, intentional self-harm
SUD	T39092A	Poisoning by salicylates, intentional self-harm
SUD	T391X2A - T3992XA	Poisoning by nonopioid analgesics, antipyretics and antirheumaticss, intentional self-harm
SUD	T420X2A - T428X2A	Poisoning by hydantoin derivatives; iminostilbenes; succinimides and oxazolinediones; antiparkinsonism drugs and other central muscle-tone depressants, intentional self-harm
SUD	T43012A	Poisoning by tricyclic antidepressants, intentional self-harm
SUD	T43022A	Poisoning by tetracyclic antidepressants, intentional self-harm
SUD	T431X2A - T434X2A	Poisoning by monoamine-oxidase-inhibitor antidepressants, unspecified antidepressant, intentional self-harm, SSRIs, other antidepressants, phenothiazine antipsychotics and neuroleptics, butyrophenone and thiothixene neuroleptics, intentional self-harm
SUD	T43502A - T43612A	Poisoning by unspecified antipsychotics and neuroleptics, other antipsychotics and neuroleptics, and caffeine, intentional self-harm
SUD	T440X2A - T448X2A	Poisoning by drugs primarily affecting the autonomic nervous system, intentional self-harm
SUD	T44902A	Poisoning by unspecified drugs primarily affecting the autonomic nervous system, intentional self-harm
SUD	T44992A	Poisoning by other drug primarily affecting the autonomic nervous system, intentional self-harm
SUD	T450X2A -T4592XA	Poisoning by primarily systemic and hematological agents, not elsewhere classified, intentional self-harm

## Appendix D: MIEMSS Approved Eligibility Criteria for Transport to a Crisis Center

### Jurisdictional Pilot Protocol: Stabilization Center

#### 1. Initiate General Patient Care

#### 2. Presentation

Patients eligible for entry into the Stabilization Center must be without an acute medical or traumatic complaint. If the patient is not requesting evaluation for an emergency medical condition and substance use is suspected, including suspected opioid patients who have improved with naloxone, patient must consent to be evaluated and transported to the Stabilization Center. Then, the EMS clinician must complete the Stabilization Inclusion Checklist.

#### 3. Treatment

Initiate patient screening. All answers must be “YES” for the referral protocol to continue. For any “NO” answers, consultation with an adult Base Station is required.

Patient without acute medical or traumatic complaint	YES	NO
Patient is age 18 or older	YES	NO
Patient is willing and able to cooperate with examination	YES	NO
Systolic BP greater than 80 mmHg and less than 220 mmHg	YES	NO
Diastolic BP greater than 50 mmHg and less than 120 mmHg	YES	NO
Pulse less than 120	YES	NO
Pulse greater than 50	YES	NO
Respiratory rate less than 22	YES	NO
Respiratory rate greater than 10	YES	NO
Blood glucose less than 300 mg/dl	YES	NO
Blood glucose greater than 70 mg/dl	YES	NO
Pulse oximetry greater than 92% and no supplemental oxygen required	YES	NO
Patient accepts transport to the Stabilization center	YES	NO
NO Evidence of significant head or truncal trauma	YES	NO
NO Evidence of new head trauma (ecchymoses, hematomas)	YES	NO
NO Evidence of uncontrolled bleeding	YES	NO
Patient can walk with no more than minimal assistance →No Assistive devices (cane, walker permitted) →No Assistance/stabilization of more than one limb required	YES	NO

#### 4. Medical consultation is required for any “NO” response.

#### 5. If all answers are “YES” or medical consultation approves if a “NO” occurs, the patient shall be transported to the Stabilization Center.