Portland State
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Mental Health Involvement in Police and Fire Calls for Service: Gresham Oregon (2016 to 2017)

Jointly Prepared by the
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and
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Executive Summary

Persons with mental illness (Pw/MI) are disproportionately represented in the criminal justice (CJ) system and may be at increased risk for experiencing a range of adverse events, including police use of force, criminal victimization, arrest and incarceration (Reuland, M., Schwarzefeld, M., Draper, L., 2009; Teller, J., Munetz, M. R., Gil, K. M., Ritter, C., 2006). This is particularly important in Oregon, where the community mental health system has been increasingly strained following de-institutionalization in the 1970s and 1980s (see Multnomah County 2004; Bloom, 2005; Zarhkin, 2019). Efforts to address this at a policing level include crisis intervention training, co-responder programs, and pre-arrest diversion. Effective administration of these and similar initiatives requires that municipalities have accurate data documenting the frequency of calls for service (CFS) involving Pw/MI, the distribution of calls in space and time, and the current resources devoted to such incidents. Prior attempts to obtain this information have typically relied upon distinct mental health codes in computer-aided dispatch (CAD) systems (see for examples, Lodestar, 2002; Teller, et al. 2006). This approach may grossly underestimate the true prevalence and impact of mental illness on emergency response providers.

Recognizing this limitation, the City of Gresham, Oregon collaborated with researchers from Portland State University's (PSU) Center for Public Service (CPS) and the Criminal Justice Policy and Research Institute (CJPRI) to develop alternative methodologies for identifying Pw/MI in the city's police and fire/emergency services (ES) CFS, and estimating the impact of such calls on these agency resources. The City provided the research team with 148,169 police CFS and 33,523 fire/ES CFS covering the years 2016 and 2017. The team developed four distinct strategies for analyzing these data and estimating mental health involvement including: 1) Stratified Random Sample, 2) CAD codes, 3) Mental Health keywords (MH Words), and a 4) Combined Approach (see appendices for detail on each method).

As might be expected, the methodology used when analyzing CFS data influenced the findings. Provided below is a summary of the results with the range in estimates given from lowest to highest.

Gresham Police Department

- Calls involving a Pw/MI account for 2.2% to 4.9% of the agency's call load.
- Incidents involving a Pw/MI or a person with possible mental illness (Poss/MI) account for 7.3% to 11.8% of police service calls.
- Calls involving a possible mental health connection (i.e., Pw/MI or Poss/MI) take significantly longer for officers to clear.
- On average, more officers and units respond to CFS with a possible mental health connection.
- Calls involving a Pw/MI or a Poss/MI account for 10.2% to 23.4% of the agency's total patrol resources.

Gresham Fire & Emergency Services

- Calls involving a Pw/MI account for 1.2% to 3.5% of the agency's call load.
- Incidents involving a Pw/MI or a person with Poss/MI account for 5.7% to 10.0% of service calls.
- Differences between mental health related and non-mental health CFS were limited when it comes to how long it takes to clear the call, the number of personnel responding, and the number of units involved.

- Mental health related CFS account for 6.0% to 10.5% of the agency's total time spent responding to calls for service.

Two additional strategies for estimating mental health involvement in police CFS were based on a survey with 51 GPD officers. Officers reported that 58.3% to 69.2% of their recent CFS involved at least one person with mental illness or possible mental illness. Consistent with the analyses reported above, CFS with a mental health connection had more officers respond and they took significantly longer to clear than calls without a mental health nexus.

The variability seen in our estimates of mental health involvement in emergency response CFS highlights the value of using multiple estimation techniques to triangulate in on the "truth". Taken as a whole, the findings suggest that mental illness plays a much larger role in police, and fire/ES than has been previously documented in the academic literature.

Background

The City of Gresham covers nearly 23.5 square miles and has an estimated population of 110,000 residents. The city is served by a police force with over 160 employees (including police officers and support staff) and a fire/ES department of over 100 employees, including fire fighters and support staff (City of Gresham, 2018). Police and fire/ES budgets make up a large share (37%) of Gresham's "all funds" operating costs. The 2017/2018 combined budget for police was $37 million, with another $24 million allotted to fire/ES.

These agencies address some of the most important aspects of the day-to-day lives of Gresham's citizens. In fiscal year 2018, Gresham's emergency service agencies responded to 90,504 CFS. This includes 74,147 calls handled by the police, and 16,357 calls for fire/ES (City of Gresham, 2018). While police and fire/ES have a variety of responsibilities, responding to emergency calls is the core function of both departments. With this in mind, CFS can be an appropriate resource to gauge how mental illness in the community is affecting the management of local public safety resources.

Anecdotally, police and fire/ES professionals in Gresham believe that call response related to mental health represents a substantial portion of their workload. Police leaders in Gresham have listed mental health as one of the agency's top four priorities (Benedict, May 3, 2019). Police estimate that around 50% of their calls have a mental health nexus, and have created a taskforce to address the issue (Benedict, May 3, 2019). The Fire/ES department has also recognized the impact mental health CFS have on their service delivery. Issues related to mental health are clearly perceived to be a major issue within the police and fire/ES departments.

This report uses police and fire/ES data from the City of Gresham to estimate the workload attributable to emergency CFS involving persons with mental illness or possible mental illness. The findings are supplemented by a survey with 51 Gresham police officers.

Literature Review

At a national level, the United States has seen a dramatic shift from inpatient care of persons with serious mental illness, towards community-based care. This transition has resulted in increased contact between persons with a mental illness (Pw/MI) and the criminal justice system (Lamb, 1998; Lamb, Weinberger & Gross, 2004; Sigurdson, 2000). Pw/MI are disproportionately represented at all levels of the criminal justice system, including an increased risk of arrest and incarceration (Reuland, M., Schwarzefeld, M., & Draper, L., 2009; Teller, J., Munetz, M. R., Gil, K. M., & Ritter, C., 2006). While there has been less research on the frequency of police contacts with Pw/MI, Teplin (1984) found that police contact with Pw/MI were higher than the prevalence of mental illness within the population would suggest.

Given their disproportionate representation in the criminal justice system, it is likely that police and Pw/MI interact frequently. Estimates regarding the percentage of CFS involving Pw/MI and police vary widely depending on the methodology employed to create the analysis. These estimates range from 1% of dispatched calls in a recent meta-analysis (Livingston, 2016), to 4% for non-traffic stop suspects determined via observations in the field (Engel & Silver, 2001), to 10% of contacts as reported by police representatives (Janik, 1992). Nationally, 7% is frequently cited as the proportion of police contacts

involving Pw/MI (Deane, M., Steadman, H., Borum, R., Vesey, B. & Morrissey, J. 1999; Ruiz & Miller, 2004).

Many studies have used police CFS data to estimate contact involving Pw/MI, relying on unique classification codes affixed to the incidents in the records management systems (RMS). The Akron, Ohio Police Department reported that 7% of their calls between 1998 and 2004 were related to a mental disturbance (Teller, et al., 2006), and the Los Angeles Police Department reported that 2% of their calls in 2002 were coded as mental disturbance calls (Lodestar, 2002). Estimates based on discrete call classifications likely under-estimate the full impact of mental health on the system, as they do not consider other call types that have a concurrent mental health nexus.

Livingston (2016) conducted a meta-analysis[1] on contact between police and persons with a mental disorder. Using 13 studies, the analysis estimated that approximately 1% of police-dispatched calls involve people with a mental disorder. The individual studies, which varied in size and quality, produced estimates ranging from under 1%, to over 20% of calls involving persons with a mental disorder. However, the majority of the studies which found higher rates (classified as over 5% of calls involving persons with a mental disorder) were small in scale. As Livingston points out, a significant problem with research in this area is establishing a valid method for identifying the when a mental disorder plays a role in a call. Rigorous observation in the field is resource-intensive, while larger-scale studies often involve the use of classification systems that rely on the reports of dispatchers and police. These studies, often using secondary data that was not collected for this purpose, likely underestimate the impact of mental health issues on police resources.

In addition to existing studies on the subject, there is anecdotal evidence that contacts between police and Pw/MI form a greater percentage of overall police calls than previously reported, and that these calls are growing in number. This is evidenced by the increased police interest in programs such as Crisis Intervention Teams (CIT) and CIT training. These teams and training have disseminated throughout law enforcement at a rapid rate (Watson, A. C., Morabito, M. S., Draine, J., & Ottati, V. 2008).

While a growing body of both literature and policy consider the overlap between police CFS and mental health, there is a shortage of research considering the volume of fire and medical 911 calls involving Pw/MI. However, there is reason to believe that there may be higher proportions of calls involving Pw/MI within such calls for service as well. A considerable volume of research has emphasized the negative physical health impacts associated with a diagnosis of a serious mental illness (SMI), such as schizophrenia or bipolar disorder. Research indicates that between 50% and 80% of those with a SMI have comorbid medical conditions which may contribute to premature death (Kilbourne, Cornelius, Han, Shad, Salloum, Conigliaro, & Haas, 2004; Kupfer, 2005). These health issues are exacerbated by a lack of access to routine health care (Weber, Cowan, Milikan & Niebur, 2009). In addition to increased morbidity, individuals with mental and/or behavioral health problems (i.e. including conditions such as addiction) account for a disproportionate volume of those classified as frequent emergency medical resource users. An analysis of 911 calls to the Baltimore City Fire Department found that mental and behavioral health issues were associated with being a frequent user of these services (defined as having used the services more than six times during the study period). Nearly one quarter (23.4%) of the frequent users suffered from behavior health issues (Knowlton, Weir, Hughes, Southerland, Schultz, Sarpatwari, et al., 2013).

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[1] Meta-analysis involves a systematic review of similar studies which allows for a quantitative estimation of their combined findings.

There are several reasons to believe that contact between Pw/MI and emergency responders is more prevalent and growing in Oregon. Between 1955 and 2005, Oregon reduced the number of public psychiatric hospital beds from nearly 300 per 100,000 residents to under 20 beds per 100,000 residents. This resulted in a high number of Pw/MI moving from institutions into the community. Oregon has one of the highest (and rising) rates of homelessness in the country (Kristina Smock Consulting, 2011), and many of the people living outside or partially sheltered are affected by mental illness. The physical and social disorder sometimes associated with homelessness has become a leading cause for complaints reported to 911 (Willamette Week, Feb 6th, 2019). Finally, Oregon's complex civil commitment process (Bloom, 2005; see also Portland Mercury, March 14th, 2019) has made it more difficult to hold and involuntarily treat people experiencing a mental health crisis.

Adding to the issues noted above, Oregon's system of community mental health care has recently come under scrutiny from the United States Department of Justice (DOJ), Civil Rights Division, resulting in an agreement (2012) to fully comply with Title II of the Americans with Disabilities Act and Olmstead v. L.C., 527 U.S. 581 (1999). As of 2014, however, the DOJ reported that, "Oregon is far behind where it needs to be in providing the high-intensity community services that are most necessary for serving people with serious mental illness in the most appropriate integrated settings."

In a subsequent update (2015) the DOJ advised Oregon to, "Work collaboratively with local agencies to develop strategies to address services for individuals experiencing mental health crises and to prevent their unnecessary hospitalization and incarceration." A first step in this direction is to accurately quantify and track contacts between Pw/MI and the criminal justice system, including contact with police officers in community settings. These data are necessary to effectively manage public safety resources (both police and fire) and improve response to mental illness. Gresham, like most other cities in Oregon, currently lacks access to this information.

The primary goal of this report is to help address this data gap by providing Gresham's policy makers with estimates on police/fire contacts involving a mental health connection. Along the way we address some of the major limitations observed in the extant research literature for this area. This includes the following:

1) There is a lack of research considering the impact of Pw/MI on fire/ES responders. While there is some research considering the proportion of calls involving Pw/MI within the emergency medical system as a whole, research specific to fire/ES responders is lacking when compared with policing research.
2) Current studies typically rely on a single methodology, resulting in wide variation in estimates for police-Pw/MI contacts. The use of multiple strategies in a single study may result in a more accurate finding.[2]
3) Studies in this area are often lacking when it comes to providing an operation definition for mental illness. Indeed, many studies never explicitly define mental illness. Instead, they rely on dispatchers and officers to apply their own definitions that may or may not be consistently applied across different coders. Other studies focus exclusively on "major mental illness" like schizophrenia and bi-

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[2] This is often referred to "triangulation" and involves establishing validity though the convergence of different data sources and/or research methodologies.

polar disorder, ignoring conditions that are still of importance to the criminal justice system and officer-citizen interactions.[3]

4) The available research also looks primarily at incidents where a person's mental health condition was the principal factor in the call (i.e., suicide attempt, mental health breakdown). This excludes other ways that mental health might contribute to CFS (i.e., false report by person with mental illness, accident involving person with mental illness).

5) Most of the existing studies focus exclusively on dispatch calls, or CFS generated by the public. Officers' self-initiated activity often exceeds one quarter (and sometimes one-half) of their call load. This could have a significant impact on overall estimations of the proportion of CFS associated with Pw/MI.

6) Most studies focus on a percentage of CFS with Pw/MI, but not on other metrics such as the number of officers needed to respond, the length of the call, or the total time spent per call. These studies make the implicit assumption that calls involving Pw/MI do not take longer or require more resources than other calls. If calls involving mental health take longer or require more resources, simply calculating the percentage of such calls relative to all calls will under-estimate the impact of mental health on public safety resources.

Research Questions (RQ)

The current study sought to answer four broad research questions concerning mental health involvement in police and fire/ES CFS in Gresham. In addition to any immediate policy implications, the findings establish a baseline the City can use for monitoring trends over time. The four questions are detailed below.

RQ1: What Percent of Gresham's CFS Involve Mental Illness?

As mentioned earlier, RQ1 is the most commonly asked question in this field of study. Livingston's (2016) meta-analysis of the literature found that just 1% of police CFS involve people with mental disorders. The wide range seen across studies in this review, from 0% to 20%, raise questions about the accuracy of the findings. Moreover, the generalizability of the results to Gresham are questionable. Most of the studies from Livingston's review are older, with 13 out of 15 published before 2010, and characteristics of the local population and mental health care system are likely to be different. The present study addresses major methodological limitations of the prior research by using several strategies for estimating mental health involvement and by considering different definitions for mental health involvement. Finally, we provide estimates for both police and fire/ES CFS, whereas most of the prior research looks solely at the former.

RQ2: Do CFS Involving Mental Illness Require More Police and Fire/ES Resources than Calls Without a Mental Health Connection?

> **RQ2a:** Do CFS Involving Mental Illness Take Longer to Clear?
> **RQ2b:** Do CFS Involving Mental Illness Require More Personnel?
> **RQ2c:** Do CFS Involving Mental Illness Require More Units?
> **RQ2d:** Do Agencies Spend More Time Overall on CFS Involving Mental Illness?

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[3] We acknowledge here that defining and diagnosing mental illness are difficult tasks. Even in tightly controlled environments, mental health providers have difficulty achieving high inter-rater reliability for some disorders listed in the DSM 5 (Regier et al., 2013).

RQ2e: What Proportion of Police and Fire/ES Resources Are Devoted to CFS Involving Mental Illness?

While most research has focused on the percentage of CFS with a mental health connection (RQ1), we argue that this may not be the best metric when assessing the overall impact of mental illness on an agency's resource allocations. A thought experiment can help explain the importance of using different approaches to studying this issue.

Imagine a police shift with ten officers working in one precinct. During the course of their shift, the ten officers respond to a total of 31 CFS. Each officer independently manages three calls that do not have a mental health connection (i.e., 30 total) and all ten officers respond to a crisis call involving a suicidal person with a firearm (i.e., Pw/MI). Using the typical approach described above, the police agency would report that just 1 of 31 CFS (3.2%) involved a Pw/MI. An alternative methodology might use officer surveys. If each officer was asked to report the percentage of their calls for the day that involved a Pw/MI, they should all answer 25%, or 1 out of 4.

Further complication arises when you consider a third unit of measurement: time. Imagine that the non-mental health calls each took 10 minutes to resolve, for a total of 300 minutes (i.e., 10 minutes per call x 30 calls x one officer per call). By contrast, the suicide call, due the risks involved for the officers and subject, took 60 minutes to clear. That means the total patrol time devoted to this one call was 600 minutes (i.e., 60 minutes x 1 call x 10 officers). In other words, for that shift, 600 out of 900 minutes of officer time (66.6%) was spent dealing with a mental health issue.

The difference between 3.2%, 25.0%, and 66.6% highlights the considerable impact research methodologies and the corresponding unit of analysis can have on the findings generated. If mental health CFS are more complex and require more officers to resolve, using just the first strategy will grossly underestimate their true impact on an agency's resources. Based on this reasoning, we framed our second research question: *Do CFS involving Pw/MI or possible MI require more agency resources than CFS without a mental health connection?*

The dataset we used allowed us to explore this question using several metrics. This includes the time it takes to clear calls (RQ2a), the number of agency personnel responding (RQ2b), the number of vehicles/units responding (RQ2c), the combined personnel time per call (RQ2d), and the overall proportion of police and fire/ES resources devoted to CFS involving Pw/MI or possible MI (RQ2e).

RQ3: Are CFS Involving Mental Illness Distributed Differently than Calls Without a Mental Health Connection?

      RQ3a: Are Certain Types of CFS More Likely to Involve Mental Illness?
      RQ3b: Are CFS Involving Mental Illness Geographically Clustered In the City?
      RQ3c: Do CFS Involving Mental Illness have a Distinct Temporal Pattern?

While the first two research questions focus on work load, our third research questions explores the distribution of calls involving Pw/MI or possible MI across call types, geography and time. Identifying the unique attributes associated with such calls can provide information that can be of operational value to the agencies involved.

Existing research has emphasized that calls for service are not randomly, nor uniformly distributed across time and space, but rather, concentrate in specific locations and at specific times. This concentration varies according to call type. With this in mind, we approach RQ3 in three phases. First, we consider calls involving a Pw/MI or Poss/MI according to the original call type (RQ3a). How are these calls coded by the dispatcher and officers as they come in? Next, we consider the spatial location of the call, both in terms of a density function (think of hot spot or heat maps) and according to neighborhood. We use this analysis to investigate where such events are concentrated within the City of Gresham (RQ3c). Lastly, we explore the date and timing of each call to investigate when such events concentrate according to day of week and time of day. Are calls involving Pw/MI or Poss/MI more common on certain days of the week or times of the day?

RQ4: What do officers think about CFS involving mental illness?

> **RQ4a:** Do officers perceive differences between CFS with and without a mental health component?
> **RQ4b:** Do officers perceive changes in the prevalence of and the community's response to CFS involving mental health?
> **RQ4c:** Can CIT training and/or the GPD's response to CFS involving mental health be improved?

Officers' observations about and experience dealing with Pw/MI and the broader mental health system in Gresham may provide additional context to the quantitative analysis of local CFS data. These three research questions differ from the prior questions in that there is no "hypothesis" to be tested. Instead, we conduct exploratory analyses and focus on how the officers "feel" about the challenges of responding to mental health calls.

Data

The City of Gresham provided the researchers with a dataset consisting of all CFS generated in 2016 and 2017 (N = 181,692)[4]. The majority of the calls were taken by the GPD (n = 148,169; 81.5%) followed by the Fire/ES Department (n = 33,523; 19.5%). These records include CFS that were generated by officers (i.e., officer-initiated) and those initiated by the public or other entities (i.e., dispatched). The computer-aided dispatch (CAD) system used for managing the calls has date and time stamps for the following actions: call received, agency personnel dispatched, personnel arrived on scene, and personnel cleared the call. Geographic locations are recorded using full addresses and latitude/longitude coordinates. CFS are categorized into distinct types at the beginning and ending of each call (e.g., fire, traffic stop, alarm, suspicious person) and agency personnel can document characteristics of the call in open-ended narrative fields. Finally, the Police Department started using "study codes" midway through 2016 to document alcohol, drug, and mental health involvement in their CFS. All of these data were used in the current study (see Appendix A for more details).

Additional data for the study was obtained through an online survey with 51 Gresham police officers. Details on the survey methodology are provided below (see also Appendix F).

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[4] Gresham's CAD system is managed by the City of Portland's Bureau of Emergency Communications (BOEC) following GPD and GF&ES policy.

Abbreviated Methodology

The current study sought to improve upon prior research by developing and evaluating several strategies for quantifying mental health involvement in Gresham's CFS. This includes the use of a more inclusive definition of mental illness. Specifically, we sought to categorize all of Gresham's CFS into three mutually exclusive groups:

- **Person with Mental Illness (Pw/MI)** – Calls for service that involved one or more people with a mental disorder or chronic mental health condition (e.g., PTSD, Anxiety, Depression, Dementia, Autism, Schizophrenia, Substance Use Disorder).
- **Person with Possible Mental Illness (Poss/MI)** – Call for service that involved one or more people who <u>might</u> have a mental disorder -or- are currently experiencing an emotional, mental, or behavioral crisis.[5]
- **Unrelated to Mental Health (Unrelated)** – Calls for service that do not appear to have any mental health involvement.

The five approaches used for classifying the CFS are briefly described below. Full details on each strategy are provided in the respective appendices.

Strategy #1 – Stratified Random Sample

We reviewed the narratives from roughly 2,500 CFS and identified 314 words that were associated with mental health. This included shorthand used by dispatchers (e.g., "1234", "55"), distinct mental illnesses (e.g., "ADHD", "Bi-polar", "Schizophrenic"), symptoms of mental illness (e.g., "paranoid", "withdrawal", "hallucinating"), references to alcohol and drugs (e.g., "beer", "marijuana", "meth"), behaviors of concern (e.g., "crying", "cutting", "overdosing"), and other terms suggesting a possible mental health connection (e.g., "psychiatric", "crazy", "disoriented"). We then counted how many of these words were present in each narrative from the 148,169 police and 33,523 fire/ES CFS. The word count was used to stratify the entire sample into calls with 0, 1, 2, 3, 4, or 5+ words. We then randomly sampled cases from each stratum resulting in a combined sample size of 11,316 police and 4,453 fire/ES calls. These CFS were then manually reviewed and classified as either Pw/MI, Poss/MI, or Unrelated. The findings from the stratified random sample were then extrapolated to the full dataset (see Appendix B for full detail).

Strategy #2 – CAD Codes

Dispatchers and emergency responders classify Gresham's CFS using a final case type. Some of the codes used suggest a mental health connection (e.g., DUII, Suicide, Overdose, Behavioral). Likewise, in September of 2016 the Police Department created three mental health "study codes" that could be attached to a CFS after it cleared. This includes "drug involved", "alcohol involved", and "mental health involved." We used these final case type and study codes to categorize all of the police and fire/ES CFS from September 1, 2016 through 2017 into three groups: Pw/MI, Poss/MI, and Unrelated (see Appendix C).

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[5] The officer survey conducted as part of this research combined Pw/MI and Poss/MI to simplify the reporting process.

Strategy #3 – Mental Health Keywords (MH Words)

The stratified random sample procedure detailed above involved reading the narratives from 15,769 CFS and categorizing each call into one of three groups (e.g., Pw/MI, Poss/MI, Unrelated). We used these data to identify a list of 419 individual words that did a good job discriminating between cases with (i.e., Pw/MI, Poss/MI) and without (Unrelated) a mental health connection. For example, the words "schizophrenia", "PTSD", and "suicide" were rarely found in cases assigned to the Unrelated group. The 419 mental health words were grouped into 10 categories, and the categories were themselves incorporated into a simple logic model. The model was used to review the narratives from each CFS received between September 1, 2016 and the end of 2017. The CFS were then classified as either Pw/MI, Poss/MI, or Unrelated (see Appendix D).

Strategy #4 – CAD & MH Word (Combined Approach)

Direct comparisons between strategies 2 and 3 above highlighted a problem with classification consistency. In other words, most of the cases assigned to the mental health related category by the CAD approach (i.e., Pw/MI or Poss/MI) were not categorized as such by the Mental Health Keyword strategy and vice-versa. Further review of the data suggests that both strategies suffer from a high number of false negatives, where cases that actually involve a mental health issue are incorrectly classified as Unrelated. The combination of strategies 2 and 3 represent a possible solution to this problem. Specifically, if either the CAD or MH Word approach coded the CFS as Pw/MI, then it was coded as such for the Combined strategy. Failing that test, the CFS was coded as Poss/MI if either the CAD or Mental Health Word strategy applied the same code. All other CFS were assigned to the Unrelated group (see Appendix E).

Strategy #5 – Officer Survey

A different approach to estimating Pw/MI in police CFS relied upon surveys with sworn officers. The link to our online survey was emailed to the agency's entire officer pool on June 16th, 2019. Follow-up reminders and roll call announcements were issued over the next two weeks to maximize the response rate. As of July 1st, 51 officers had completed the survey and these data were subject to analysis for the current report. This represents approximately 1/3rd of the total number of officers working for the Gresham PD.

The survey form (see Appendix F) provided two methods for estimating police contacts with Pw/MI or Poss/MI. First, officers were asked to recall what proportion of their CFS over the last 90 days involved someone with a mental illness or possible mental illness. Second, officers were asked to report details on their five most recent CFS. One of the questions asked whether anyone involved in the given incident had a possible mental illness. Other questions on the survey form addressed officer's opinions about CFS involving mental illness, their observations about the trends, and their experience with crisis intervention training (CIT).

Findings

RQ1: What Percent of Gresham's CFS Involve Mental Illness?

Our first research question sought to estimate the proportion of Gresham's police and fire/ES CFS that involve a person with mental illness or possible mental illness. The first three numerical columns in the table below present the total number of CFS we examined, the number categorized as involving a person with mental illness (Pw/MI), and the proportion of calls falling into this category. The rows provide the estimates from our agency (i.e., police, fire), methodology (i.e., method 1,2,3,4; CFS in last 90 days; five most recent CFS) and data source (i.e., CAD, survey) combination. The two data columns on the right provide these same estimates for calls involving Pw/MI or Poss/MI (combined) as defined earlier in this report and the applicable appendices.

Estimate of Gresham's CFS that Involve a Person with Mental Illness (Pw/MI) or Possible Mental Illness (Poss/MI)

Agency & Estimation Method (Data Source)	Total # CFS Examined	CFS Involving Pw/MI		CFS Involving Pw/MI or Poss/MI	
		Est. #	% of Total	Est. #	% of Total
Police CFS (CAD data)					
Method 1 - Stratified Sample	148,169	3,245	2.2%	14,250	9.6%
Method 2 - CAD Codes	98,489	2,848	2.9%	7,199	7.3%
Method 3 - MH Words	98,489	2,813	2.9%	7,211	7.3%
Method 4 - CAD & MH Words	98,489	4,788	4.9%	11,657	11.8%
Police CFS (survey data)					
CFS in last 90 days	n/a	-	-	-	58.3%
Five most recent CFS	221	68	30.8%	153	69.2%
Fire/ES CFS (CAD data)					
Method 1 - Stratified Sample	33,523	471	1.4%	2,340	7.0%
Method 2 - CAD Codes	22,690	280	1.2%	1,296	5.7%
Method 3 - MH Words	22,690	564	2.5%	1,676	7.4%
Method 4 - CAD & MH Words	22,690	803	3.5%	2,275	10.0%

Note: Method 1 is based on two full years of data (2016 & 2017), while methods 2-4 are based on data from 9/1/2016 to 12/31/2017.

Starting with the GPD and the four methods that relied on CAD data, we estimate that between 2.2% (Method 1) and 4.9% (Method 4) of the city's CFS in 2016 and 2017 involved a person with mental illness. When we use a broader definition of mental health involvement (i.e., Pw/MI or Poss/MI), the estimate increases considerably to 7.3% (methods 2 & 3) on the low-end to 11.8% on the high-end. Estimates based on the officer survey are substantially higher, ranging from 58.3% to 69.2%.

The prevalence of mental illness was lower in fire/ES CFS, ranging from 1.2% of CFS (method 3) to 3.5% (method 4). Consistent with the police findings, the application of a broader definition for mental health involvement (i.e., Pw/MI or Poss/MI) led to, at minimum, a three-fold increase in the prevalence rates. On the low end, we estimate that 5.7% of fire/ES CFS involve a person with mental illness or possible mental illness. The high-end figure is 10.0%.

RQ2: Do CFS Involving Mental Illness Require More Police/Fire Resources than Calls Without a Mental Health Connection?

In this section of the report, we address five questions about the quantity of police and fire/ES resources used in clearing CFS that involve one or more people with mental illness or possible mental illness. More specifically, the proportion of calls involving mental illness (i.e., RQ1) is only a good proxy for agency workload if, compared to non-mental health calls, these calls do not take longer to clear, do not involve more officers, and they do not involve more units responding.

RQ2a: Do CFS Involving Mental Illness Take Longer to Clear?

This analysis assesses whether mental health related CFS take longer to complete than calls that are unrelated to mental health. We explore this question using the same combination of agencies, data

Length of CFS by Mental Health Involvement
(minutes from dispatch to cleared)

Agency & Estimation Method (Data Source)	CFS Unrelated to Mental Health			CFS Involving Pw/MI or Poss/MI			ANOVA F*
	#	Avg.	SD	#	Avg.	SD	
Police CFS (CAD data)							
Method 2 - CAD Codes	91,290	26.7	47.0	7,199	58.6	68.1	2,847.7
Method 3 - MH Words	91,278	28.5	49.9	7,211	35.2	45.0	124.3
Method 4 - CAD & MH Words	86,832	26.4	47.2	11,657	48.0	61.1	1,974.4
Police CFS (Survey data)							
CFS in last 90 days	-	27.9	18.5	-	45.3	33.4	n/a
Five most recent CFS	68	24.8	28.1	153	52.8	44.9	22.4
Fire/ES CFS (CAD data)							
Method 2 - CAD Codes	21,394	47.0	35.6	1,296	47.6	31.9	.3
Method 3 - MH Words	21,014	46.9	35.9	1,676	48.1	28.0	1.6
Method 4 - CAD & MH Words	20,415	46.9	35.9	2,275	47.9	30.6	1.4

*Analysis of Variance (ANOVA) F-tests in red text indicate a statistically significant difference ($p < .001$) between CFS with and without mental health involvement.

Note: SD = standard deviation or the typical variation from the average.

sources, and estimation methods used for the prior analyses. The one exception is that we drop Method 1 (stratified sample) from the next four analyses (RQ2a to RQ2d) because the sampling process used would potentially bias the results. For these analyses we also combined calls involving Pw/MI with Poss/MI to simplify the tables.

The right hand column in the table above presents the results from an Analysis of Variance (ANOVA). We use this test to determine whether the difference between the two call types (i.e., CFS unrelated to mental health vs. CFS involving Pw/MI or Poss/MI) is statistically significant. In other words, was the difference between the two call types large enough that it is unlikely to be due to random variability in the data.

Starting with police CFS and CAD data, we found that all three estimation methods led to the same basic finding. Specifically, CFS involving a mental health connection (i.e., Pw/MI or Poss/MI) took significantly longer to clear than calls that were unrelated to mental health. This ranged from 23.7% longer using Method 3 (MH Words) to 119.8% longer using Method 2 (CAD Codes). Similar findings were obtained using officer surveys, with the discrepancy ranging from 62.4% (CFS in last 90 days) to 112.9% higher (Five most recent CFS). By contrast, CFS involving possible mental illness do not appear to have a meaningful impact on the time needed to clear fire/emergency service incidents.

RQ2b: Do CFS Involving Mental Illness Require More Personnel?

In addition to taking more time, it is also possible that calls involving mental illness require more emergency personnel. The next table provides the results from this analysis.

Based on CAD data and surveys, we found that mental health related police calls involve significantly more officers on average than calls without a mental health connection. With CAD data, for example, an average of 1.6 officers responded to non-mental health calls while mental health related CFS involved an average of 2.2 to 2.4 officers. The difference between the two types of calls was even larger for survey data, with mental health related calls involving 57.1% to 63.2% more officers (on average). These results were reversed for fire/emergency service calls. Calls with a mental health connection involved slightly fewer responders on average than calls unrelated to mental health. One explanation for the police-fire difference is that fire/ES teams usually respond to calls as a whole, whereas police officers operate largely as independent units (i.e., one per vehicle).

Number of Personnel Responding Per CFS by Mental Health Involvement

Agency & Estimation Method (Data Source)	CFS Unrelated to Mental Health			CFS Involving Pw/MI or Poss/MI			ANOVA F*
	#	Avg.	SD	#	Avg.	SD	
Police CFS (CAD data)							
Method 2 - CAD Codes	91,290	1.6	1.0	7,199	2.4	1.0	4,395.5
Method 3 - MH Words	91,278	1.6	1.0	7,211	2.2	1.1	2,034.2
Method 4 - CAD & MH Words	86,832	1.6	1.0	11,657	2.2	1.0	4,911.0
Police CFS (Survey data)							
CFS in last 90 days	-	1.9	.7	-	3.1	1.2	n/a
Five most recent CFS	68	2.1	1.3	153	3.3	1.6	32.8
Fire/ES CFS (CAD data)							
Method 2 - CAD Codes	21,394	4.6	1.6	1,296	4.8	1.5	34.3
Method 3 - MH Words	21,014	4.6	1.6	1,676	4.7	1.4	7.6
Method 4 - CAD & MH Words	20,415	4.5	1.6	2,275	4.8	1.5	34.7

*Analysis of Variance (ANOVA) F-tests in red text indicate a statistically significant difference ($p < .001$) between CFS with and without mental health involvement.

RQ2c: Do CFS Involving Mental Illness Require More Units?

Another approach to assessing resource utilization is to consider the number of service units or vehicles that respond to a call. The next table compares mental health related and non-mental health related CFS on this metric. Our officer survey did not ask about responding units so these rows have been eliminated from the table.

Consistent with the prior findings, police CFS that have a mental health connection involve significantly more units on average than CFS with no mental health involvement. This was true for police calls and fire/emergency service calls, although the former evidenced a larger difference.

Number of Units Responding Per CFS by Mental Health Involvement

Data Source & Estimation Method	CFS Unrelated to Mental Health			CFS Involving Pw/MI or Poss/MI			ANOVA F*
	#	Avg.	SD	#	Avg.	SD	
Police CFS							
Method 2 - CAD Codes	91,290	1.4	0.8	7,199	2.1	0.8	5,196.2
Method 3 - MH Words	91,278	1.4	0.8	7,211	2.0	0.9	2,682.4
Method 4 - CAD & MH Words	86,832	1.4	0.8	11,657	2.0	0.9	6,073.4
Fire/ES CFS							
Method 2 - CAD Codes	21,394	1.9	0.6	1,296	2.2	0.5	144.4
Method 3 - MH Words	21,014	1.9	0.6	1,676	2.1	0.4	125.9
Method 4 - CAD & MH Words	20,415	1.9	0.6	2,275	2.1	0.5	194.2

*Analysis of Variance (ANOVA) F-tests in red text indicate a statistically significant difference ($p < .001$) between CFS with and without mental health involvement.

RQ2d: Do Agencies Spend More Time Overall on CFS Involving Mental Illness?

Two of the earlier analyses examined clearance times and the number of agency personnel responding. The combination of these two factors might be the best way to assess differences in resource utilization between mental health and non-mental health CFS. For each call in the dataset, this study multiplied the length of the call in minutes (i.e., dispatch to clearance) by the number of responding officers/firefighters. The same process was used with our officer survey data. The results from this analysis are provided in the next table.

Starting with police CAD data, CFS that are unrelated to mental health take an estimated combined time ranging from 55.3 minutes (Method 4) to 61.7 minutes (Method 3). Calls involving Pw/MI or Poss/MI take between 88.8 minutes (Method 3) and 158.4 minutes (Method 2). Depending on methodology, this means that mental health related CFS use between 43.9% and 181.8% more officer time. This finding was supported by the survey data, where officers reported that mental health related CFS took from 149.1% to 211.0% more time to clear (combined).

Fire calls unrelated to mental health take between 218.0 minutes (Method 4) and 218.6 minutes to clear (Method 3) while those related to mental health take between 226.1 minutes (Method 3) and 231.7 minutes (Method 2). These differences were not statistically significant using a threshold of $p < .001$ (i.e., the difference may be due to random sampling error).

Combined Time Per CFS by Mental Health Involvement
(minutes from dispatch to cleared multiplied by number of personnel)

Agency & Estimation Method (Data Source)	CFS Unrelated to Mental Health			CFS Involving Pw/MI or Poss/MI			ANOVA F*
	#	Avg.	SD	#	Avg.	SD	
Police CFS (CAD data)							
Method 2 - CAD Codes	91,290	56.2	131.5	7,199	158.4	218.7	3,567.2
Method 3 - MH Words	91,278	61.7	142.2	7,211	88.8	140.6	243.2
Method 4 - CAD & MH Words	86,832	55.3	131.6	11,657	126.1	193.7	2,617.5
Police CFS (Survey data)							
CFS in last 90 days	-	58.4	67.6	-	145.5	118.9	n/a
Five most recent CFS	68	62.6	98.7	153	194.7	231.0	20.6
Fire/ES CFS (CAD data)							
Method 2 - CAD Codes	21,394	218.4	188.7	1,296	231.7	188.7	6.1
Method 3 - MH Words	21,014	218.6	191.3	1,676	226.1	153.8	2.4
Method 4 - CAD & MH Words	20,415	218.0	190.1	2,275	229.8	176.1	8.0

*Analysis of Variance (ANOVA) F-tests in red text indicate a statistically significant difference ($p < .001$) between CFS with and without mental health involvement.

RQ2e: What Proportion of Police/Fire Resources Are Devoted to CFS Involving Mental Illness?

Having estimated the proportion of Gresham's police and fire/ES CFS that involve possible mental illness and the combined time devoted to clearing these calls, we can now estimate the total proportion of agency emergency response resources that are used in clearing these calls. For these analyses we combine mental illness (Pw/MI) and possible mental illness (Poss/MI).[6]

As displayed in the next table, using Method 1 we estimate that GPD officers handled 14,250 CFS involving a person with possible mental illness during the years 2016 and 2017. This represents 9.6% of all police calls during this period. Clearing these calls took an estimated 20,966 hours (i.e., the number of minutes to clear call multiplied by the number of officers responding, and the number of calls). This accounts for 13.8% of the agency's total time responding to calls for service over the two year period.

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[6] Our methodology for estimating total agency resources could not be applied to the survey data because we had access to only a small sample of calls. With the CAD data we had all calls for the given time periods.

Estimate of Agency Resources Devoted to CFS Involving Mental Health (i.e., Person with Mental Illness or Possible Mental Illness)

Data Source & Estimation Method	# Mental Health CFS	% of Agency's Total CFS	# Hours Spent on Mental Health CFS	% of Agency's Total Hours
Police CFS				
Method 1 - Stratified Sample	14,250	9.6%	20,966	13.8%
Method 2 - CAD Codes	7,199	7.3%	19,000	18.2%
Method 3 - MH Words	7,211	7.3%	10,669	10.2%
Method 4 - CAD & MH Words	11,657	11.8%	24,501	23.4%
Fire/ES CFS				
Method 1 - Stratified Sample	2,340	7.0%	7,731	6.5%
Method 2 - CAD Codes	1,296	5.7%	5,004	6.0%
Method 3 - MH Words	1,676	7.4%	6,315	7.6%
Method 4 - CAD & MH Words	2,275	10.0%	8,711	10.5%

Note: Method 1 is based on two full years of data (2016 & 2017), while methods 2-4 are based on data from 9/1/2016 to 12/31/2017.

Methods 2 through 4 were based on CFS from 9/1/2016 through the end of 2017. Here, we estimated that officers responded to between 7,199 (Method 2) and 11,657 (Method 4) mental health related calls, ranging from 7.3% to 11.8% of all calls during the given period. This amounted to between 10.2% (Method 3) and 23.4% (Method 4) of the agency's total emergency response time for the given period.

Turning to fire/ES CFS, we estimated that the department handled 2,340 calls during 2016 and 2017 that involved a person with mental illness or possible mental illness, accounting for 7,731 person hours, or 6.5% of the agency's total response time (Method 1). Alternative estimates using the other three methods and a reduced timeframe (i.e., partial year for 2016) resulted in 1,296 calls involving possible mental health (5.7%; Method 3) to 2,275 calls (10.0%; Method 4), accounting for 5,004 to 8,711 person hours. This amounted to 6.0% to 10.5% of the agency's total emergency response time from September 2016 through to the end of 2017.

RQ3: Are CFS Involving Mental Illness Distributed Differently than Calls Without a Mental Health Connection?

RQ3 looks for patterns in the distribution of mental health related CFS (i.e., call type, geography, time) that may benefit operational or strategic planning. For all of these analyses we combined Pw/MI and Poss/MI and refer to this as possible mental illness or a mental health related CFS. We also based the analyses on the classification of calls using the CAD and Mental Health Keyword combined approach

(Method 4). This also means that all of the following analyses are based on calls generated from 9/2016, through the end of 2017.[7]

RQ3a: Are Certain Types of CFS More Likely to Involve Mental Illness?

Our first analysis considers whether certain types of calls are more likely to involve a person with a possible mental illness. Dispatchers, in some cases officers, apply a "final case type" code to document the nature of the incident as each CFS is cleared. There were 309 different codes used by for this purpose during the study period. Some are specific to police incidents; others pertain solely to fire/ES calls. We grouped these codes into 21 categories to simplify the analysis of these data.

Police CFS by Final Case Type and Mental Health Involvement

Final Case Type (most frequent codes used)	Total # CFS	CFS Involving Pw/MI or Poss/MI	
		#	% of Total
Suicidal (suicd, mccl, suicdw, jump)	733	733	100.0%
Assist (assist, miss, park, medical)	5,335	1,506	28.2%
Trimet (tmet, tmep, tmepw)	701	191	27.2%
Area Check (welck, welckp, premck, areack)	9,039	2,382	26.4%
Disturbance (distp, unwnt, harass, noise)	13,858	2,806	20.2%
Person Crime (thret, asslt, assltp, sex)	4,862	981	20.2%
Suspicous (susp, suspp, vice, suspw)	7,194	753	10.5%
Other (civil, stndby, detail, death)	2,087	168	8.0%
Unknown (911h, flag, miscp)	1,940	149	7.7%
Fire (ilburn, grass, vfire, misck)	54	4	7.4%
Info (info, infof, fwb, fwn)	3,437	188	5.5%
Property Crime (theft, vehst, theftp, vand)	11,175	501	4.5%
Crash (accnon, acchr, ta1, accinj)	3,573	158	4.4%
Admin (follow, acase, acan, prop)	9,197	332	3.6%
Stop (trastp, substp, rstln, 77)	21,379	746	3.5%
Hazard (hazard, animl, power, smokea)	1,460	38	2.6%
Community Policing (compol, compop, commtg)	500	10	2.0%
Alarm (afalse, almcom, axempt, almres)	1,965	11	0.6%

Note: Classification of calls based on combined CAD and Mental Health Word strategies. Case types listed with red text are more likely to involve a mental health component as compared to the 11.8% baserate.

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[7] The limited timeframe prevented us from assessing whether there are seasonal patterns in these data.

The first column in the prior table documents the final case types applied to police CFS. The second column lists the total count for each type of call. The third and fourth columns give the estimated count and proportion of calls that involved a person with possible mental illness based on Method 4. Across all CFS, we estimated that 11.8% involved a person with possible mental illness. Any final case type that exceeds this figure is highlighted in red text.

As seen in the table, all 733 CFS involving suicidal subjects were categorized as mental health involved (i.e., person with possible mental illness). This reflects the use of these case types in our coding scheme for Method 4. Among the other case types, over one quarter of Assist (28.2%), Trimet (27.2%) and Area Check (26.4%) calls involved a person with possible mental illness. Disturbance calls (20.2%) and Person Crime calls (20.2%) also exceeded the base rate for mental health involvement. By contrast, Alarm (0.6%), Community Policing (2.0%), Hazard (2.6%) and Stop calls (3.5%) were among the least likely to have a mental health nexus.

Fire CFS by Final Case Type and Mental Health Involvement

Final Case Type (most frequent codes used)	Total # CFS	CFS Involving Pw/MI or Poss/MI	
		#	% of Total
Behavioral (be3, be8, be9)	156	156	100.0%
Overdose (od3, od1, od9)	703	703	100.0%
Person Crime (as3, as9, as1)	738	211	28.6%
Other	10	1	10.0%
Unknown (uk9, uk3, uk8)	623	48	7.7%
Medical (tr3, br1, ch1)	14,664	1,013	6.9%
Admin (polreq, invest, drill)	112	7	6.3%
Crash (ta1, mvaunk, ta1ped)	1,257	66	5.3%
Assist (lift, pubast, water)	1,274	29	2.3%
Hazard (power, smokea, gasinv)	719	15	2.1%
Fire (ilburn, grass, miscf)	829	12	1.4%
Alarm (almcom, almres, almaud)	1,483	13	0.9%
Info	122	1	0.8%

Note: Classification of calls based on combined CAD and Mental Health Word strategies. Case types listed with red text are more likely to involve a mental health component as compared to the 10.0% baserate.

The table above provides the same analysis for fire/ES calls. The base rate for mental health involvement in these CFS was 10.0% (i.e., Pw/MI or Poss/MI). All Behavioral and Overdose fire/ES calls were classified as being related to mental health. This was a product of the estimation methodology used (Method 4). Among the remaining case types, only Person Crimes (28.6%) was disproportionately related to mental

health. Information (0.8%), Alarm (0.9%) and Fire (1.4%) calls were the least likely to involve a person with mental illness or possible mental illness.

One additional analysis was available for the police.[8] The CAD system records whether the call was generated by dispatchers, the officer(s) involved (i.e., self-initiated), an alarm, or some other means. We identified the proportion of calls within each type that were mental health related. As shown in the table below, self-initiated CFS were much less likely to involve a mental health connection (3.7% versus the 11.8% base rate). Calls classified as "other" in the CAD system had the highest level of mental health involvement (23.7%), followed by dispatch calls (13.8%).

Police CFS by How Call Received and Mental Health Involvement

How Call was Received	Total # CFS	CFS Involving Pw/MI or Poss/MI #	%
Self-Initiated (onview)	37,218	1,376	3.7%
Dispatch (typed)	37,023	5,110	13.8%
Alarm	2,481	13	0.5%
Other (e.g., other, CAD to CAD)	21,767	5,158	23.7%

Note: Classification of calls using combined CAD and Mental Health Word strategies.

This basic pattern was confirmed using data from the officer survey. Officers were asked to report on their five most recent CFS. For each call they documented whether it was self-initiated or dispatched and whether any of the people involved had a possible mental illness. Self-initiated CFS were less likely to involve mental health issues as compared to calls generated by dispatch (48.4% vs. 77.7%).

RQ3b: Are CFS Involving Mental Illness Geographically Clustered In the City?

Research on policing in general finds that calls for service are spatially concentrated in specific locations. Whether this holds true for mental health related CFS was addressed in the next set of analyses. The figure provided below is a density or "heat map" showing the locations for mental health related police calls. Areas with a higher density of calls are displayed in red. As the color scale shifts into orange, yellow, green and blue, the density of these calls for service decrease. The location of events themselves are displayed as black points. Major roadways are depicted as bold black lines on the map.

The most notable concentrations of police calls for service involving possible mental illness are centered in Rockwood neighborhood, located in Gresham's North West. These locations generally fall along NW Burnside Road and NW 181st Avenue, continuing north along NW 181st towards the Wilkes East and North Gresham neighborhoods. A second series of high-density concentrations fall within Gresham's Central City neighborhood, which is located further to the South East along Burnside. Within this

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[8] Fire/ES calls are almost always generated by dispatchers so this analysis was not applicable.

downtown area, the most considerable hotspots of incidents occur along NE Division St. Several additional locations display higher-density concentrations of calls for service, typically falling along major routes or at major intersections.[9]

The next figure is a choropleth map, which aggregates mental health related police CFS according to the neighborhood in which the event occurred. The total number of CFS for each area is provided in the

Police Calls for Service Involving a Person with Mental Illness or Possible Mental Illness: Gresham, Or (9/2016 to12/2017)
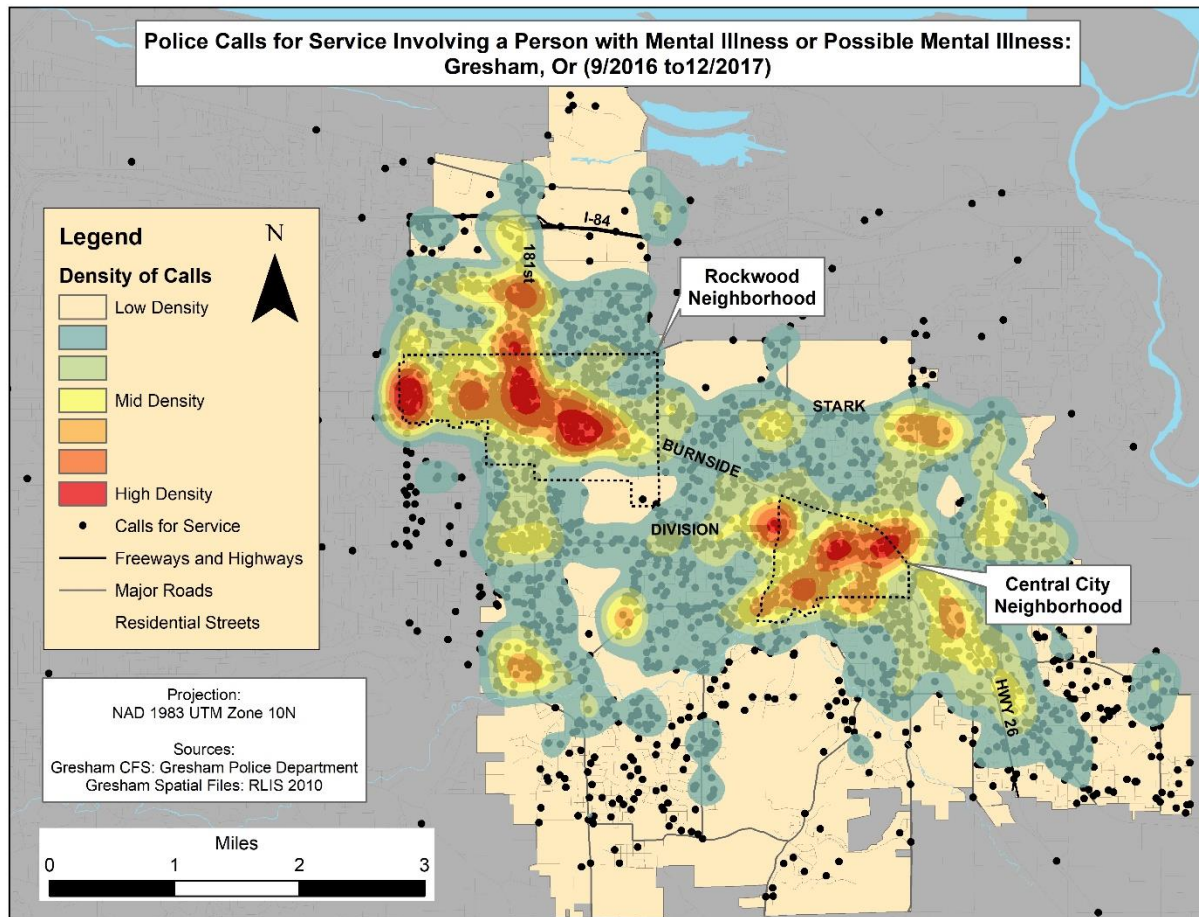
neighborhood's label. In addition, each neighborhood is shaded according to the percentage of CFS involving possible mental illness as a proportion of *all* police calls for service within the neighborhood. Note that when aggregated across neighborhoods, the base rate for possible mental illness using Method 4 was 11.8%.

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[9] It is important to note that the maps in this report do not control for underlying population density. Just because an area has a higher density of mental health related CFS does not mean that a higher proportion of the people in this area have mental illness.

Count of Police Calls for Service Involving a Person with Mental Illness or Possible Mental Illness: Neighborhoods in Gresham, Or (9/2016 to12/2017)

Legend

% of CFS Involving Possible MI
- 10.0% or Less
- 10.1% to 12.0%
- 12.1% to 14.0%
- Greater than 14.0%

Projection:
NAD 1983 UTM Zone 10N

Sources:
Gresham CFS: Gresham Police Department
Gresham Spatial Files: RLIS 2010
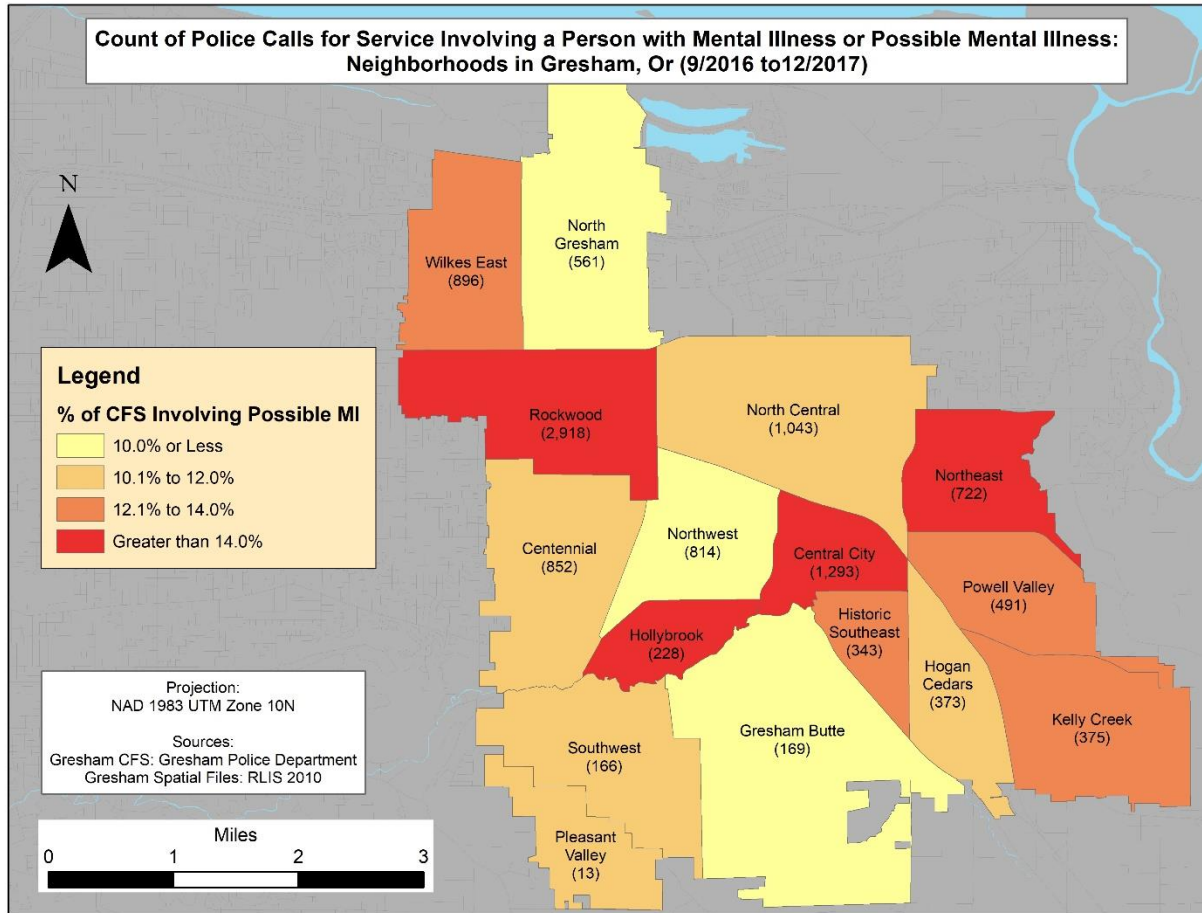
The Rockwood neighborhood again stands out as the location with the highest number of calls involving possible mental illness (2,918). This is followed by Central City (1,293), re-emphasizing with the spatial patterns associated with call density as highlighted in the prior map. These neighborhoods, along with Northeast and Hollybrook, are all shaded in red, indicating that calls involving Pw/MI or possible MI make up over 14.0% of the total calls for service within these neighborhoods. This contrast is interesting, as Northeast and Hollybrook have fewer calls within their neighborhood boundaries, but a higher proportion of these calls involving possible mental illness.

Fire/Emergency service CFS exhibit a similar spatial pattern as police calls (see next map). Specifically, Rockwood contains the highest density of fire/ES calls involving possible mental illness, with the Central City neighborhood containing another notable concentration. One deviation from police CFS was the Centennial neighborhood, where fire/ES calls were also densely concentrated in two areas.

Fire Calls for Service Involving a Person with Mental Illness or Possible Mental Illness: Gresham, Or (9/2016 to12/2017)
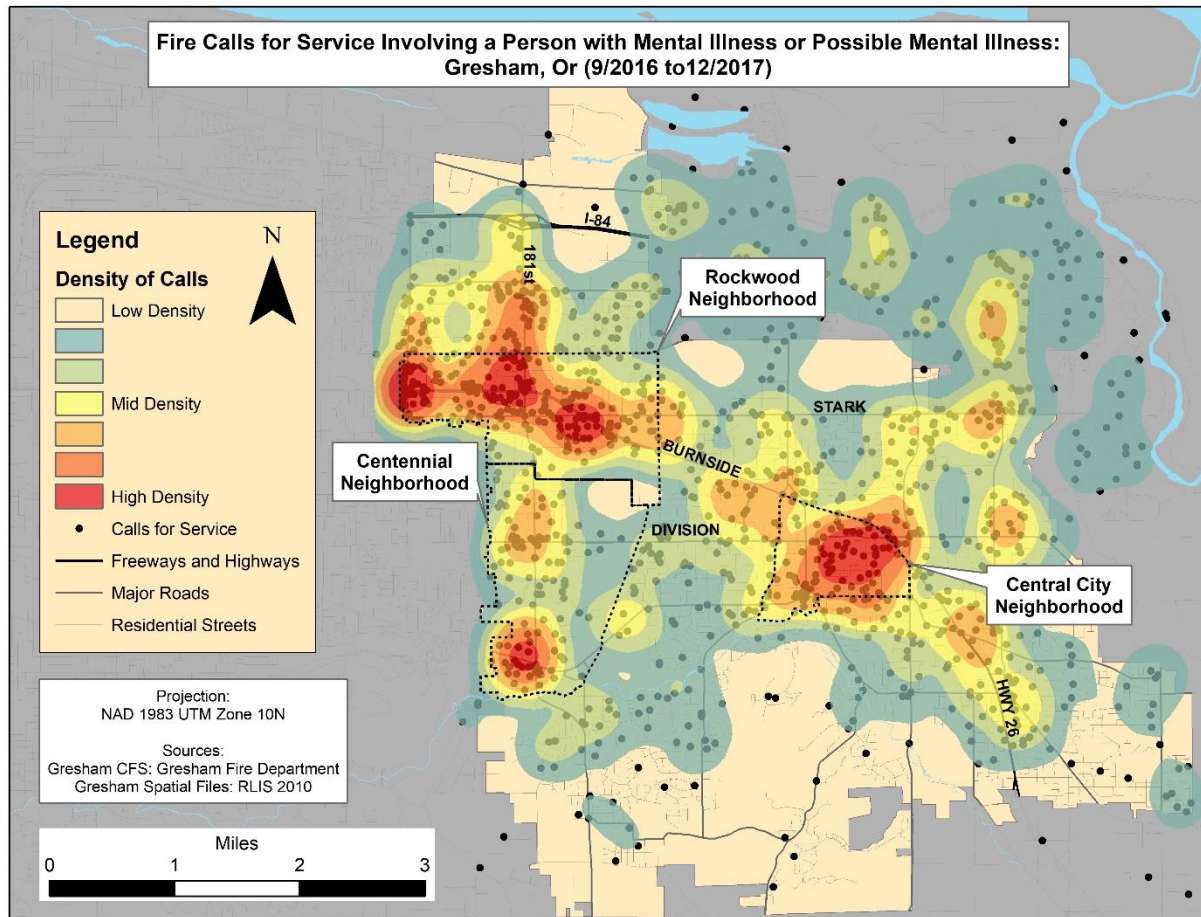
As shown in the next choropleth map, the Rockwood neighborhood continues to stand out with the highest count of fire/ES calls for service involving possible mental illness (434) and a higher proportion of fire/ES calls relating to mental illness as compared to the 10.0% base rate for fire/ES calls overall. Central City, Wilkes East and Historic Southeast are also highlighted as locations with more than 12.5% of fire/ES calls for service categorized as Pw/MI or possible MI.

Count of Fire Calls for Service Involving a Person with Mental Illness or Possible Mental Illness: Neighborhoods in Gresham, Or (9/2016 to12/2017)
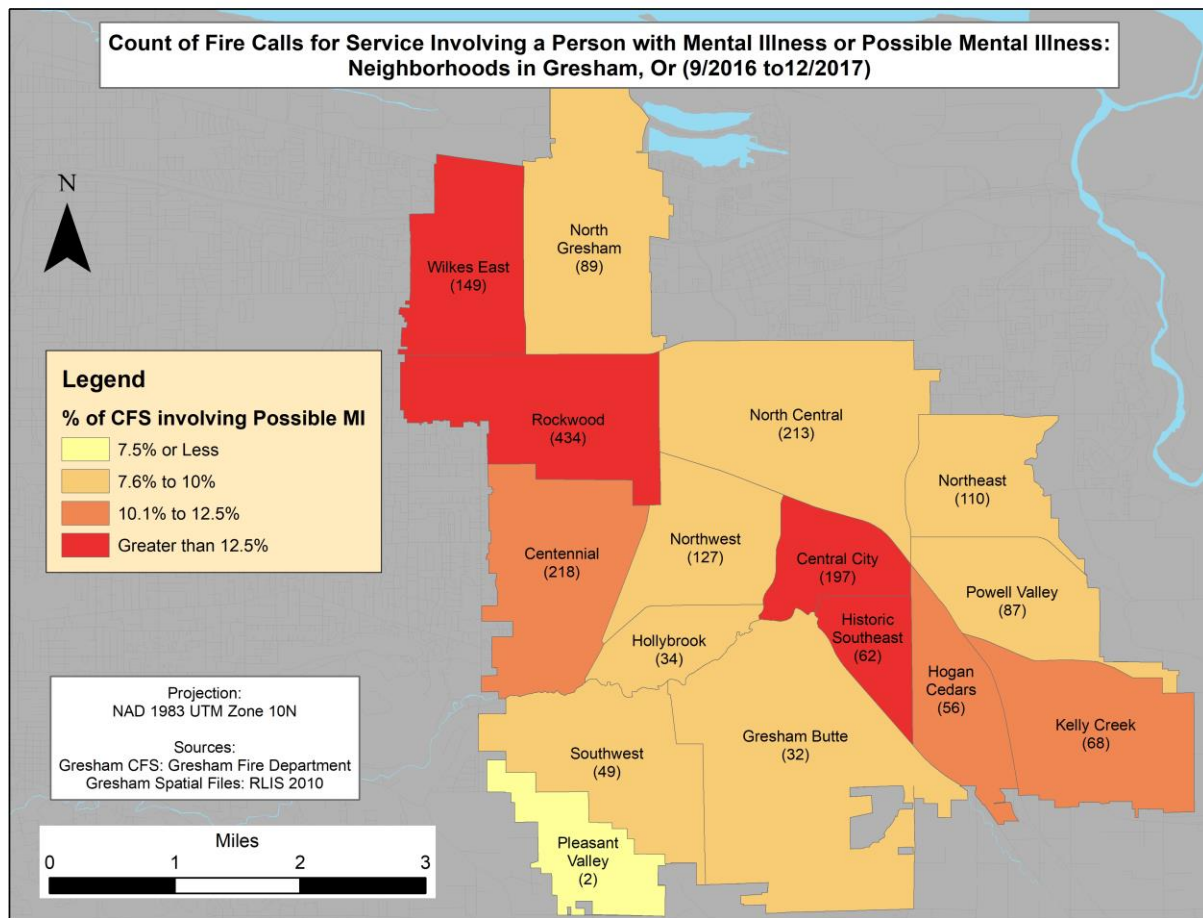
RQ3c: Do CFS Involving Mental Illness have a Distinct Temporal Pattern?

The next set of analyses assessed whether mental health related police and fire/ES CFS have a different temporal pattern than calls that are unrelated to mental health. To conduct these analyses we determined the day of week and hour of day for each CFS using the date/time stamp indicating when the call was received (or initiated by officers). We used these data to create a table for each agency. In the table, we provide the number of CFS for each time of day/day of week combination (referred to as cells). We then colored the cells based on the standard deviation from all time of day/day of week combinations. Cells colored green are one standard deviation or more <u>below</u> the average and cells colored red are one standard deviation or more <u>above</u> the average. The same basic idea was applied to the row totals for day of week and the column totals for time of day.

As shown in the table below, police CFS that are unrelated to mental health were much less frequent in the early morning hours of most days and were highest between 10:00am and 11:00pm with noticeable spikes at 4:00pm and 10:00pm. Sundays accounted for the lowest number of calls, while Thursday had the highest number. The pattern for mental health related calls was somewhat different, with peaks on most days between 4:00pm and 10:00pm. Friday and Saturday had higher call numbers and Monday saw the fewest calls.

Distribution of Police CFS by Day of Week, Time of Day, and Mental Health Involvement

Not Mental Health Related

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	Total
Sun	106	176	256	381	413	454	451	487	466	551	468	521	427	546	541	553	499	444	619	476	388	292	203	125	9,843
Mon	182	286	511	638	678	740	689	590	657	775	711	658	514	596	552	578	540	486	380	288	269	178	144	137	11,777
Tue	202	368	571	703	965	870	778	783	795	851	815	678	509	625	566	522	549	434	357	299	227	209	170	151	12,997
Wed	176	415	540	645	729	741	637	654	746	749	882	681	641	622	607	700	837	747	377	333	258	186	166	121	13,190
Thu	185	422	771	772	874	789	664	642	726	710	868	745	651	633	610	697	793	693	609	397	335	251	191	147	14,175
Fri	202	415	512	546	586	621	541	600	700	679	780	684	657	619	669	869	962	891	572	408	328	261	188	153	13,443
Sat	142	257	330	382	431	434	438	476	502	465	622	610	581	548	576	749	847	746	752	458	402	305	206	148	11,407
Total	1,195	2,339	3,491	4,067	4,676	4,649	4,198	4,232	4,592	4,780	5,146	4,577	3,980	4,189	4,121	4,668	5,027	4,441	3,666	2,659	2,207	1,682	1,268	982	86,832

Mental Health Related (Pw/MI or Poss/MI)

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	Total
Sun	23	25	42	34	52	69	59	67	63	75	75	80	85	62	94	82	95	100	110	106	93	61	41	26	1,619
Mon	31	29	46	68	66	69	57	88	60	78	83	94	92	79	100	83	79	64	76	49	48	34	20	20	1,513
Tue	29	29	50	52	62	80	59	71	87	74	91	86	86	100	90	92	85	87	65	73	76	33	18	19	1,594
Wed	16	30	53	64	63	99	61	75	88	88	116	99	94	82	108	83	89	87	62	42	55	29	27	16	1,626
Thu	19	35	50	68	67	68	79	75	75	98	96	122	106	89	106	81	106	93	71	65	55	44	26	26	1,720
Fri	14	32	45	66	67	67	83	95	80	86	105	108	111	110	95	113	113	114	85	69	41	44	18	19	1,780
Sat	29	34	43	53	65	51	65	64	74	80	117	94	106	109	102	106	127	99	105	92	69	56	36	29	1,805
Total	161	214	329	405	442	503	463	535	527	579	683	683	680	631	695	640	694	644	574	496	437	301	186	155	11,657

Note: Based on classification of calls using combined CAD and Mental Health Word strategies. Number of CFS provided within each cell and cells colored based on deviation from average: Red (+1 SD above mean), Green (-1 SD below mean).

The next table documents the temporal distribution of Gresham's fire/ES calls. Contrasting somewhat with police calls, fire and emergency service calls that are unrelated to mental health tend to cluster in the early to middle part of the day, between 9:00am and 5:00pm. By 11:00pm the frequency of calls has dropped off considerably and they remain low throughout the early morning hours. Calls involving a person with possible mental illness are also lower between 2:00am and 8:00am but appear to be slightly more frequent during the early evening hours from 6:00pm to 10:00pm. The highest frequency of these calls happens on Sundays.

Distribution of Fire CFS by Day of Week, Time of Day, and Mental Health Involvement

Not Mental Health Related

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	Total
Sun	80	91	107	133	127	128	152	149	141	156	144	144	145	159	160	118	112	92	102	100	82	70	72	80	2,844
Mon	90	115	153	143	146	176	185	157	161	163	166	160	139	142	130	121	109	108	81	72	71	61	58	64	2,971
Tue	96	96	136	160	139	139	153	163	153	145	158	164	146	143	139	115	115	81	82	75	66	64	45	61	2,834
Wed	92	109	115	135	169	145	177	171	132	134	157	134	148	139	140	117	90	97	87	66	80	50	55	57	2,796
Thu	90	112	133	163	158	145	151	156	166	152	159	171	148	135	147	139	101	111	76	78	65	63	55	82	2,956
Fri	80	96	133	166	165	160	156	168	154	173	180	186	166	131	124	180	144	99	80	92	62	58	60	75	3,088
Sat	82	91	117	130	146	162	146	147	146	143	164	157	156	136	119	147	116	118	93	83	92	89	72	74	2,926
Total	610	710	894	1,030	1,050	1,055	1,120	1,111	1,053	1,066	1,128	1,116	1,048	985	959	937	787	706	601	566	518	455	417	493	20,415

Mental Health Related (Pw/MI or Poss/MI)

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	Total
Sun	9	10	12	4	14	6	20	13	17	16	14	22	25	17	23	25	18	18	17	18	24	13	9	8	372
Mon	4	6	10	16	13	13	20	23	19	16	18	17	20	15	23	13	21	16	8	13	9	7	3	4	327
Tue	3	12	7	10	14	15	20	14	9	11	17	13	19	12	17	15	16	16	11	20	8	6	2	7	294
Wed	4	8	15	11	18	16	13	8	21	15	16	15	22	17	14	15	18	9	13	9	15	3	5	7	307
Thu	6	6	7	9	15	16	15	12	16	16	22	16	16	14	18	17	15	17	10	12	7	8	2	18	310
Fri	6	6	12	17	16	9	18	17	24	27	17	13	23	19	9	20	18	15	16	7	10	4	6	6	335
Sat	2	7	6	16	7	9	16	15	11	16	16	21	20	17	29	14	22	11	18	14	15	6	11	11	330
Total	34	55	69	83	97	86	122	102	117	117	120	117	145	111	133	119	129	100	100	91	93	46	44	45	2,275

Note: Based on classification of calls using combined CAD and Mental Health Word strategies. Number of CFS provided within each cell and cells colored based on deviation from average: Red (+1 SD above mean), Green (-1 SD below mean).

RQ4: What do officers think about CFS involving mental illness?

The survey conducted with GPD officers covered several additional topics that provide additional context for the topics covered earlier in this report. These topics are addressed below.

RQ4a: Do officers perceive differences between CFS with and without a mental health component?

The prior analyses found that GPD officers believe more than one-half of their CFS involve someone with a mental illness or possible mental illness. Here we ask officers how they feel about these calls. Specifically, are mental health related CFS more difficult to clear, do they take more police resources, and do they present a greater risk for those involved?

As the next table above indicates, a large majority (84.3%) of officers reported that it is easier to clear CFS that do not involve mental health. None of the respondents indicated that mental health calls were easier to clear, however, 15.7% reported there was no difference. This survey did not explore why most officers found mental health related calls more challenging. Interviews and/or focus groups with officers should be considered as an important follow-up to this research.

GPD Officers' Perceptions About Mental Health (MH) Related CFS

Which Type of CFS…..	CFS with No MH Connection	CFS Involving Possible Mental Illness	No Difference Between the Two
Is the easiest to clear?	84.3%	0.0%	15.7%
Takes more police resources?	2.0%	88.2%	9.8%
Has the highest risk for use of force by officers?	6.0%	58.0%	36.0%
Has the highest risk for officer injury?	5.9%	62.7%	31.4%

Note: Based on surveys completed by 51 officers.

A large majority of respondents (88.2%) also reported that CFS with a mental health component take more police resources. This is consistent with our earlier findings that calls involving a person with mental illness or possible mental illness require more officers, more units, and more time overall to clear.

Smaller majorities reported that CFS involving possible mental illness are at higher risk for use of force by police (58.0%) and at higher risk of resulting in injury to officers (62.7%). The latter finding is interesting in that it potentially conflicts with a study of police use of force in Portland, Oregon (Morabito & Socia, 2015). In this analysis of Portland Police data from 2008 to 2011, researchers found that when force was used, mental health status (as reported by police) was not predictive of officer injury. Given that Gresham and Portland share a boundary and have similar training, these differences warrant further investigation.

While Morabito and Socia's findings seem to contradict the perceptions of GPD officers, there is an important distinction between the two. The Morablito and Socia study was limited to incidents where force was used (i.e. the unit of analysis was uses of force incidents), while in this study the unit of analysis was the call for service. It is possible that the increased likelihood of injury is driven by the increased probability of use of force. This is consistent with what the GPD officers report. Unfortunately, drawing firm conclusions is difficult as the factors influencing police use of force on mental health calls are complex (see Morabito, Kerr, Watson, Draine, Ottati, & Angell, 2012). Additional research in this area would be valuable.

RQ4b: Do officer perceive changes in the prevalence of and the community's response to CFS involving mental health?

Here we focus on officer perceptions regarding the prevalence of mental health related CFS and their opinions about the response to mental illness in the local community. Specifically, we are interested in knowing whether officers have seen changes in these areas during the course of their career with GPD.

Our first question asked whether officers see more, fewer, or about the same number of persons with mental illness in their recent CFS (compared to when they started at GPD). Nearly nine out of ten officers (88.0%) reported that CFS involving a Pw/MI had increased compared to when they started their career at the GPD (see below).

Officer's Perceptions About Local Community and Mental Health Resources

Do you see more, fewer, or about the same number of Pw/MI in your recent CFS?

More 88%
Fewer 4%
About the same 8%

Do officers have more, fewer, or about the same resources available for dealing with Pw/MI?

More 53%
Fewer 16%
About the same 31%

Has the local criminal CJ system's response to Pw/MI gotten better, worse, or stayed about the same?

Worse 50%
Better 12%
About the same 38%

Has the local MH community's response to Pw/MI gotten better, worse, or stayed about the same?

Worse 32%
Better 30%
About the same 38%

Officers were then asked whether they have more, fewer, or about the same resources available for dealing with people with mental illness. Interestingly, more than one-half (53.1%) of the officers felt they had more resources than when they stated at GPD. Only 16.3% felt they had fewer resources. This finding contrasts somewhat with the next two items exploring how the criminal justice system and local mental health community are responding to mental illness. Only 12.0% of officers felt that the local criminal justice system's response to mental illness had improved. Similarly, only 30.0% of the officers perceived an improvement in the local mental health community's response to Pw/MI. Additional research is needed to delve into the reasons for officers' opinions on these topics.

RQ4c: Can CIT training and/or the GPD's response to CFS involving mental health be improved?

One of the most common policing strategies to improve the handling of CFS involving mental illness or significant emotional distress is crisis intervention training or CIT. All but one of the GPD officers surveyed reported that they had some exposure to CIT or similar programs. Most (54.0%) reported having completed 50 or more hours of such training over the course of their career. All but two of 49 officers said this training was at least "a little helpful" (36.7% "a little helpful"; 34.7% "moderately

helpful"; 24.5% "very helpful"). Finally, most of the officers surveyed (70.6%) said they were equally qualified to handle mental health and non-mental health related CFS.

In short, this group of officers appears to have extensive experience responding to CFS involving mental illness. This provides an important context for the last two questions asked in our survey. We asked officers to two open-ended questions and then looked for themes in their text responses:

- How could mental health trainings like CIT be improved? (19 responses)
- What could the GPD do to improve their response to mental health calls? (10 responses)

Some of the comments about CIT were explicit in pointing out the need for more practical training experiences that lead to the development of applied skills:

- *"More practical application instead of death by PowerPoint. I forget everything unless it's practical."*
- *"Less abstract ideas and more concrete solutions for dealing with people in mental health crisis."*
- *"…Many trainings discuss de-escalation without actually describing de-escalation techniques."*
- *"Have officers do sit-alongs with crisis line phone operators (phone) and answer calls. Makes them learn / practice their verbal skills. Real good way to get experience."*

Other comments suggested a need for additional information on community resources, the procedures for mental health holds, and responding to dangerous situations:

- *"Go into detail of process of evaluation at Hospital when subjects are placed on Police Officer Hold. Would help to understand that process better."*
- *"Training specific to local resources and how to access them. Training that lets people know who to contact when there is a system failure or a person in need of services 'after hours', etc..."*
- *"I want the training to inform me on specific resources that are available in my jurisdiction."*
- *"Training around when to walk away sooner if there is any threat of violence, as the governmental interest has been proven over and over again (especially within the 9th circuit court)."*

Other responses pointed out that training was not issue; instead, they focused on the difficult nature of interactions involving some Pw/MI, how some members of the mental health community fail to appreciate this difficulty, and a lack of resources.

- *"I would like people in the mental health field to recognize that we see people in extreme crisis and a lot of the time no amount of talking will make them stop doing what they are doing to get the police called on them. There is no magic phrase that some social worker can teach me to make a bipolar guy, high on meth put down a bat."*
- *"I could have all the training in the world but without metal heath beds at hospitals, we are putting Band-Aids on gunshot wounds."*

With regard to GPD specific changes, we identified two basic themes including a need for more resources, and the need for broader systems change.

Police Resources

- *"I would increase the size of the GPD Mental Health Team and I would increase the size of patrol. On some shifts, there are only seven patrol officers available to take calls for service. With lower numbers of officers come a lower level of service."*
- *"Get more officers on the road. Assign more officers to the MHT"*
- *"We need a full blown mental health team that responds to calls involving people with MH problems. When I worked for my last large agency, they had a team with an officer and nurse that would respond to those calls, take them from patrol, and deal with them. Freed up patrol and saved a bunch of time for us."*

Broader Systems Change

- *"This is much bigger than GPD, this is a state issue and until we as a state make this a priority (large state run mental health facilities) there is not much we can do as law enforcement."*
- *"I would suggest that we stop putting a bandage on the problem and start providing the long term help to these people. The Police, if we are expected to deal with these calls, should NOT be expected to return countless times to deal with the same people with the same problems."*
- *"The system needs to be more robust to support police calls. The police response has improved, but when the system people are referred into is so anemic, there is little hope that future contacts will be reduced and there is a dread feeling that eventually the encounters will require serious or deadly force."*
- *"GPD does a great job with the resources they have. I think the mental health system as a whole nationwide needs more staff and more resources. GPD needs more officers to free up more time dealing with these issues. Also quicker response time from Mental Health professionals."*
- *"I need resources to deal with non-criminal mental illness calls. Places to take them, response teams for those who do not qualify to be taken anywhere. It's not the training that is the problem…"*
- *"More state money for hospitals and more court time to commit certain individuals. The police already are burdened with mental health and SHOULD NOT be the primary resource as the issue is a continuous revolving door with no real end game."*

A final theme that emerged from several comments concerned the perceived "fairness" of using policing as the primary vehicle for addressing mental illness:

- *"Have a more robust mental health system so hopefully officers aren't the go-to people to answer the mental health crisis calls. Building strong relationships with hospitals, clinicians, families, etc., so police input is sought prior to policies being formed that 'require' the use of police. In so, being realistic about what police can and can't do, and what a likely response could be. It has long seemed that police are used to pass the preverbal legal buck when others don't want to assume the risk and liability of dealing with a situation. If a consumer acts out, call the police. If they walk away from a program, call the police. Police are likely going to have to make*

physical contact and the liability for that will fall on the police, not the program. This is often not good, right, or fair."

Summary

The primary objective of the current research was to estimate the proportion of Gresham's police and fire/ES calls for service that involve at least one person with mental illness or possible mental illness. Answering this question will help city managers and public safety administrators make informed decisions about allocating resources and implementing policies to meet the needs of those afflicted by mental illness in the community.

Unfortunately, the available literature on this topic proves of limited value when trying to assess mental health involvement in emergency calls for service. Research conducted in other jurisdictions may not be applicable to Gresham and most studies suffer from significant methodological limitations. This includes failure in operationally defining mental illness, reliance on a single data source or coding scheme, and limited attention to alternative metrics for assessing the impact of mental health related calls on agency resources.

The current study used a mixed-methods approach involving several coding systems and data sources to examine the impact of mental health on Gresham's emergency response system. A consistent theme across the different approaches was that CFS involving mental illness or possible mental illness typically require more resources than calls that are unrelated to mental illness. This is particularly true for police CFS, where (on average) mental health related CFS take longer to clear, involve more officers and more units.

With regard to the prevalence of CFS involving possible mental illness, we found rates that were considerably higher than previously documented in the academic literature. Livingston's recent meta-analysis found that just 1% of police CFS involved people with a mental disorder. Our study estimates that the figure for Gresham is between 2.2 to 4.9% for police CFS and 1.2 to 3.5% for fire/ES calls. Moreover, based on our review of the CAD data, we believe that the larger estimates based on our fourth coding strategy are the most accurate (i.e., 4.9% and 3.5%). We found many instances where the narrative for the CFS noted the involvement of a Pw/MI, but the GPD's mental health flag was not checked in the CAD system. Likewise, the narrative field for many incidents was largely missing, but dispatchers/officers coded the call as mental health related. Thus, the combination of these two coding schemes seems to provide the best estimate for mental health involvement.

Anecdotal reports suggest that these figures may still be too low. Dispatchers, police officers, firefighters, and emergency service providers may be reluctant to "diagnose" people as mentally ill, leading to deflated estimates of mental health involvement in CFS. To address this we loosened our operational definition to include people with a possible mental disorder. For example, we coded an incident as mental health involved if the narrative reported that a person involved might have a mental illness or if the person behaved in ways that suggested a current behavioral/emotional crisis (e.g., acts of self-harm, substance use combined with aggressive behavior). With this expanded definition our estimates rose to 11.8% for police calls and 10.0% for fire/ES.

Even these estimates may be too low, given that our survey with 51 GPD officers found rates of mental health involvement (i.e., Pw/MI or Poss/MI) in their recent CFS ranging from 58.3% to 69.2%. Human memory is far from perfect, and mental health related CFS may have greater emotional salience for officers leading to over-estimation of their prevalence. It seems unlikely, however, that this accounts for the full difference observed between officers' estimates and the findings from our CAD coding schemes. Instead, we attribute most of the difference to insufficient documentation of mental health involvement in the CAD system. The existing mental health study codes, the classification of call types, and the narrative (remarks) fields are currently insufficient for accurately documenting the prevalence of mental illness in police and fire/ES calls.

We believe that Gresham is not alone in this regard. The low rate of mental health involvement found in prior studies using CAD data (1%) seems inconsistent with officers' experiences in the field and other sources of criminal justice data where Pw/MI are overrepresented. Indeed, Gresham's higher estimates of mental health based on CAD data might suggest that the city is doing a better job than most in documenting the involvement of mental illness in their CFS.[10]

Where does all of this leave us in regards to estimating the prevalence of mental illness in Gresham's CFS? At a minimum, we believe that one in ten of the city's police and fire/ES calls for service involve one or more people with a possible mental health condition. It is conceivable, however, that this figure might be closer to one-half when a more inclusive definition of mental illness is applied. These calls for service involve more officers, units, and time overall (particularly for police), suggesting that the overall impact of mental illness on Gresham's public safety resources is substantial.

Gresham might benefit from a comprehensive review of their existing policies and practices related to the management of mental health related calls for service. Some of the findings reported herein regarding the geographic and temporal patterns in mental health CFS may be helpful in this regard. Efforts to strengthen their approach to documenting mental health involvement in CFS is also warranted given some of the observations from the current study. This includes providing officers and dispatchers with clear definitions for the study codes, training to achieve high inter-rater reliability, and periodic monitoring.

Finally, Gresham may want to explore ways to quantify the costs involved in their response to mental health related calls for service. While this report attempts to quantify the number of these calls and the resources they take in terms of people and time, it does not put a dollar value to these efforts. The high prevalence of these calls and their resource intensive nature make it likely that the City of Gresham is spending considerable sums responding to them.

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[10] An alternative explanation, beyond the scope of the current study, is that rates of mental illness are higher in Gresham and/or that people with mental illness in Gresham are more likely to have contact with police/fire than is the case for other cities.

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Appendix A – Computer Aided Dispatch (CAD) Data

Our analysis utilized Gresham Police and Fire/ES calls for service (CFS) for the years 2016 and 2017. This included a total of 148,169 police calls and 33,523 fire/ES calls (N = 181,692). Police CFS are usually divided into two types: Officer-Initiated and Dispatched. The former is generated when officers place themselves on a call in response to something they observe (e.g., traffic violation, suspicious activity). Dispatch calls are usually the result of citizens calling 911 or the agency's non-emergency number to report something of concern. Other police CFS entered into the county's CAD system[11] include Alarm calls and CAD-to-CAD transfers. The distribution in the police dataset was as follows: Officer-Initiated (n = 57,200; 38.6%), Dispatched (n = 86,968; 58.7%), CAD-to-CAD (n = 205; .1%), and Alarm (n = 3,793; 2.6%). Three calls were missing this information. Fire/ES CFS are usually initiated through dispatchers, but a few are generated through other means. The fire/ES calls in our dataset were distributed as follows: Self-Initiated (n = 853; 2.5%), Dispatched (n = 32,469; 96.9%), CAD-to-CAD (n = 34; .1%), and Alarm (n = 167; .5%).

Once a CFS is generated in the CAD system dispatchers and responding officers enter additional information to document the various features of the incident. Time and date stamps are used to detail when the call was received, when officers were dispatched, and when the call was closed (i.e., cleared in dispatch language). The identification codes for the responding personnel are tracked as well as the IDs for the agency vehicles involved (i.e. units). Other codes are used to describe the nature of the call and how it was cleared. Finally, narrative information for the incident and details on how it was resolved in can be entered into three "remarks" fields.

The time and date stamps were used in the current study to quantify the amount of time it took to clear calls. More specifically, we calculated the number of minutes for each call by subtracting the "cleared" date/time from the "dispatched" date/time. For a small number of police cases (n = 199; .1%) the result of this formula produced an unusually high number (e.g., 1,700 minutes), suggesting that officers may have forgotten to close the call. Rather than eliminate these cases, we assigned them a score of 600 minutes. The same procedure was applied to 13 fire/ES CFS.

For another small group of police CFS (n = 5,102; 3.4%), dispatchers or patrol supervisors cancelled the call before the responding officers/units arrived on scene. For most of these calls (n = 3,791) the time calculation produced a result of zero minutes, indicating that the call was immediately terminated. Our time and date calculation for the remaining calls (n = 1,311) generated a number above zero minutes. We chose to leave these incidents as calculated based on the possibility that officers spent this time in transit before the call was cancelled. We applied the same logic to the 835 fire/ES CFS that were cancelled, all but five of which had a time listed above zero minutes.

In the current study, we also examined whether CFS involving Pw/MI or possible MI required more agency personnel and vehicles than calls that did not have a mental health connection. The information needed to answer this question came from three fields in the CAD system used to record the responding unit(s). With police calls, each of the three unit fields listed up to two officers (i.e., DPSST numbers). This meant that the our numbers for responding police vehicles was capped at three and the number of

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[11] The City of Gresham participates in a countywide computer-aided dispatch or CAD system that is managed by the Bureau of Emergency Communications or BOEC.

officers involved was capped at six. Fire/ES calls were also restricted to documenting up to three vehicles, but the number of responders per vehicle went as high as 17.

A third metric for assessing resource utilization for mental health related calls combined the two approached described above. Specifically, we multiplied the number of people responding to each CFS by the number of minutes it took for the call to be cleared. We readily acknowledge that this approach assumes all of the responding units and officers were involved for the full period. In reality, units and people may arrive and depart at different times, depending on their availability and the requirements of the call. Unfortunately, the data needed for a more nuanced calculation of each unit's time from dispatch to clearing the incident were not available to us.

Another area of investigation for the current study was variation in mental health related incidents by call type, time, and geographic location. For the former we used the "final case type" listed in the CAD system. This field is used by dispatchers and officers to describe the nature of the incident. The final case type may not be the same as the "initial case type" entered immediately upon generating a call. The classification of an incident can change based on the information learned at the scene. During the study period, there were 309 options (i.e., final case type codes) for classifying fire/ES and police CFS. We grouped these codes into 21 categories to simplify the analysis. As seen in the table below, stops, disturbances, property crimes, and area checks accounted for more than one-half of police CFS. Medical calls accounted for 64.5% of the fire/ES calls.

Final Case Types for Police and Fire CFS (2016 to 2017)

Final Case Type	Police CFS		Fire CFS		Examples
	#	% of Cases	#	% of Cases	
Admin	13,633	9.2%	165	0.5%	Follow-up calls, delivery of food baskets, drills/test calls
Alarm	2,958	2.0%	2,230	6.7%	Silent alarm, robbery, fire alarm
Area Check	13,354	9.0%	n/a		Check on a person or area
Assist	7,830	5.3%	1,852	5.5%	Assisting citizens or other agencies
Behavioral	n/a		244	0.7%	Person acting out, aggressive
Compol	800	0.5%	n/a		Community policing activity
Crash	5,257	3.5%	1,934	5.8%	Accidents involving cars, pedestrians, bicycles
Disturbance	20,904	14.1%	n/a		Juvenile issues, noise, disturbance calls
Fire	77	0.1%	1,284	3.8%	Fire or suspected fire
Hazard	2,122	1.4%	962	2.9%	Chemical spills, downed power lines, vehicle hazards
Info	5,205	3.5%	184	0.5%	Informational broadcast
Medical	n/a		21,637	64.5%	People with medical issues or injuries
Other	3,059	2.1%	26	0.1%	Mostly civil issues that do not fit into other categories
Overdose	n/a		1,046	3.1%	Intentional and accidental overdoses
Person Crime	7,221	4.9%	1,069	3.2%	Assaults, sexual offenses, gunshots, violations of restraining orders
Property Crime	15,914	10.7%	n/a		Burglary, theft, stolen vehicles
Stop	34,534	23.3%	n/a		Person stops, traffic stops, pursuits
Suicidal	1,079	0.7%	1	0.0%	Suicidal persons, transfers from crisis line
Suspicious	10,242	6.9%	n/a		Suspicious persons, vehicles, vice activity
Trimet	1,032	0.7%	n/a		Incidents involving Tri-Met
Unknown	2,948	2.0%	889	2.7%	911 hangups, officers flagged down, unknown
Total Calls	**148,169**		**33,523**		

Our spatial analysis explored the spatial distribution of mental health calls for service within the City of Gresham. Local spatial data files were acquired through Oregon's Regional Land Information System (RLIS). This data source includes updated road network files, as well as municipal and neighborhood boundaries, and additional features such as water networks, which were used in this study to provide spatial context.

The data input used to represent calls for service involving Pw/MI or possible MI were identified using the combined Methodology 4. A total of 11,657 police calls for service were imported into ESRI's ArcGIS 10.5, and were geocoded based on the X and Y coordinate information included in the call record. 68 events were missing spatial reference data. The remaining events were displayed as points on a map, and then were used as an input point layer to create a Kernel Density layer (required for the heat map). The kernel density layer was created using an output cell size of 36.2 feet and a default search radius of 1417.7 feet, and was edited for display using 7 categories and a natural breaks classification with a color scale ranging from blue to red, and the lowest density setting left blank. The heat map layer was adjusted for transparent display so that the point layer and underlying geographic data could be identified.

A total of 2,275 fire/ES calls for service involving Pw/MI or possible MI were identified and used for spatial analysis following the previously mentioned methodology. Two of these events were missing spatial reference data and could not be mapped. The remaining events were displayed as a point layer, and were used as input for the development of a Kernel Density layer. The output cell size for this layer was 18.1 feet, and the default search radius of 2109.4 feet was selected.

Following density-based mapping, each record was matched according to the neighborhood in which it was associated with. This matching was performed using the "NEIGH" field within the calls for service data. This process necessarily excludes all events that occur outside of the Gresham city limits, and all events that do not have a neighborhood field attached. Associated data for all calls for service was further joined to each neighborhood, facilitating the mapping of both the count of Pw/MI/possible MI calls per neighborhood, as well as the percentage of Pw/MI/possible MI calls as a proportion of all calls for service.

Our temporal analysis looked at the distribution of mental health and non-mental health CFS by time of day and day of week. These analyses were based on the date and time that the call was received. It is possible that a slightly different pattern would emerge if clearing date and time were used instead. In addition, we unable to assess seasonal patterns in police and fire/ES CFS due to the limited number of years examined. Ideally, we would need five to ten years' worth of data to identify stable trends by month.

A final and critical source of data for the current study was the open-ended remarks fields in the CAD system. The county's records management system provides three fields for dispatchers and officers to document characteristics of the incident and how it was resolved. We started by combining these three fields into a single narrative record with each element separated using the pipe character "|". Next, we took several steps to anonymize the data by removing as much identifying information as possible (e.g. names, license plates, contact information). As discussed in the appendices that follow, we then reviewed this text field to look for mental health indicators.

Our first approach to estimating mental health involvement in Gresham's CFS involved a manual review of the narrative from 11,316 police and 4,453 fire/ES calls. We started by developing a working definition for mental illness, something that is in itself fraught with considerable difficulties and value judgements. After reviewing the academic literature, reading several thousand narratives, and experimenting with preliminary coding schemes we opted for an approach that classified each call using a three-level mutually exclusive hierarchal variable: 1) CFS involved a person with mental illness [Pw/MI], 2) CFS involved a person with possible mental illness [Poss/MI], and 3) CFS was unrelated to mental health. A brief definition for each level was developed and examples were added in an effort to increase coding consistency. The resulting rating scale is documented below.

- **Person with Mental Illness (Pw/MI)** – The CFS narrative directly states that one or more of the people involved (e.g., complainant, suspect, subject of report, victim, witness) has a mental disorder or a chronic mental health condition. Any of the following would satisfy this criterion:
    - The CFS reports that someone has a mental disorder listed in the DSM-5 (e.g., PTSD, Anxiety, Depression, Dementia, Autism, Schizophrenia, Substance Use Disorder).
    - The CFS reports that someone is exhibiting a cardinal feature of a major DSM-5 disorder (e.g., hallucinations, delusions, paranoid thinking, "chronic drinker", "heroin addict").
    - The CFS reports that someone has a history of mental illness, but the specific disorder is not documented (e.g., "1234 history", "is a known 1234").
    - The CFS reports that someone has <u>previously</u> attempted, threatened, or thought about (i.e., ideations) harming themselves (e.g., "Hx of suicide attempts", "Attempted suicide last month").
    - The CFS reports that someone is currently under the care of professionals who provide support/treatment to people with mental illness (e.g., group home, psychiatrist, psychologist, psychiatric hospital unit).
- **Person with Possible Mental Illness (Poss/MI)** – The CFS narrative <u>suggests</u> that one or more of the people involved (e.g., complainant, suspect, subject of report, victim, witness) has a mental disorder or is experiencing an emotional, mental, or behavioral crisis. Any of the following would satisfy this criterion:
    - The CFS reports the "possibility" of a mental illness for someone involved (e.g., "suspected 1234", "possibly 1234", "acting 1234", "1234 or DK").
    - The behavior leading to the CFS is repetitive or atypical for the given context and suggestive of a behavioral crisis (e.g., crying in public with no obvious cause, yelling at cars passing by on street, harassing people in a store, refusing to leave when ordered, naked in public).
    - The CFS documents substance use or possible use (e.g., "drinking", "HI", "possibly DK") that is accompanied by problematic behavior (e.g., refusing to leave location, theft, vandalism, yelling, threatening, fighting, harassing people, wandering in traffic).
    - The CFS reports use/suspected use of a substance in combination with driving, preparing to drive, or having recently driven a motor vehicle (e.g., "possible DUI").
    - The CFS reports or suggests a recent act, threat, or ideation involving self-harm (e.g., "intentional OD on pills", "cut wrist").
    - The CFS involves an unintentional overdose on alcohol, MJ, or other illicit substance.
    - The CFS involves threats to harm/kill other people that appear to be beyond a situational conflict involving instrumental aggression (i.e., not a typical fight over an accident, an argument with storeowner over a refund, or a domestic dispute).

- o The CFS involves a child (under age 18) who is a repeat "runner" (i.e., runaway child).
- o The CFS involves repetitious or very serious behavior problems by child under age 13 (e.g., hitting teachers, school suspensions, chronic parent-child fights, repeated vandalism or thefts).

- **Unrelated to Mental Health** – The CFS narrative did not contain any information that would result in coding it as a Pw/MI or Poss/MI.

Provided below are several narratives showing how they were coded using the system described above.

- "TRANSFER FROM CRISIS LINE. BROTHER HAD LOCKED HIMSELF IN BATHROOM / THROWING THINGS. IS OUT NOW. HAS 1234 HX AND COMP THINKS POSS HI BUT UNK ON WHAT. SUBJ IS [redacted], WM, 21, MED, GRN T SHRT, SHORTS. 4 ADULTS AND 4 CHILDREN IN THE HOUSE ALSO. NO WEAPS | FAMILY TRANSPORTED SON TO HOSPITAL|" [Pw/MI]

- "F 20S, CONS/ALERT, BR OK, THINKS HAVING A MENTAL HEALTH ISSUE AND NEEDS TO GO TO AMB. APPEARS TO BE HALLUCINATING, THINKS HAS 1234 ISSUES AND OFF HER METH. KNOWN METH USER. ...SEE RELATED FIRE CALL RG16-1059||" [Pw/MI]

- "COMPL SAYS SHE CANT CARE FOR HERSELF ANY LONGER, SHE IS COLD, BIPOLAR BUT OFF MEDS, REFUSED THE CRISIS LINE BECAUSE SHE SAID THEY ARE NOT ABLE TO HELP HER, REFUSING MEDICAL | ANSWERED QUESTIONS AND ADVISED RESOURCE WOULD BE AVAILABLE DURING REG BUSINESS HOURS.|" [Pw/MI]

- "DAUGHTERS BOYFRIEND IS BACK, ANGRY AND DRUNK, IS INSIDE TRASHING THE HOUSE, REFUSES TO LEAVE, COMP LOCKED IN BEDROOM | NO CRIME. DK MALE HALF WAS GETTING HIS THINGS AND MAKING A MESS|" [Poss/MI]

- "TRANSIENT FEM IFO LOC W/CART, SCREAMING AND RUNNING INTO TRAFFIC...WF CURLY DRK HAIR, GRN PLAID JKT, BJS, BOOTS. MIGHT BE FEM WHO CALLED A FEW TIMES FROM THIS AREA WANTING ACCESS TO BLDG FOR HER MEDS??? | WE COULD NOT FIND SOMEONE TO TAKE HER. SHE ASKED TO BE DROPPED OFF AT THE HOSPITAL|" [Poss/MI]

- "COMP'S DOTR IS LISTED AS A RUNNER AND HAS BEEN THRET SUICIDE, COMP JUST WATCHED HER WALK BACK TO SCHOOL GROUNDS, COMP FOLLOWED HER AND IS WAITING IN LOT IN WHI DODGE CARAVAN||" [Poss/MI]

- "AT THE BUS STOP ON THE CORNER WITH O'REILLYS ON IT, F38, CONSC/ALERT, SOB, CHEST PAIN, WAS ON ANTIBIOTICS FOR A "BLOOD INFECTION" AND THE MEDS "AREN'T WORKING", COMP SAYS SHE'LL FLAG DOWN CREWS||" [Unrelated to MH]

- "M87, FELL WHILE TRYING TO TRANSFER HIM TO WHEELCHAIR, WT 150, NOT INJD, ||" [Unrelated to MH]

- "VERY DISTRAUGHT ELDERYLY DRIVER WAS REAR ENDED, BEIGE TOYT CAMRY VS UNK TYPE VEH. IN THE MEDIAN. CANT TELL ME IF SHE WANTS MED. BUT THINKS SHE IS BLOCKING AND WANTS POLICE||" [Unrelated to MH]

During the course of our preliminary coding, we reviewed more than 2,500 randomly selected police CFS. While reading the narratives we recorded words that had a mental health connection or possible connection. This included shorthand used by dispatchers (e.g., 1234, 55), distinct mental disorders (e.g., ADHD, Bi-polar, Schizophrenic), symptoms of mental disorders (e.g., paranoid, withdrawal,

hallucinating), references to alcohol and drugs (e.g., beer, marijuana, meth), behaviors of concern (e.g., crying, cutting, overdosing, yelling), and other terms suggesting a possible mental health connection (e.g., psychiatric, gibberish, crazy, disoriented). This process generated a list of 314 words.

We then used text-analysis software to count how many of these 314 words were present in the narrative for all of the police (N = 148,169) and fire/ES calls (N = 33,523) in our dataset. Starting with the police calls, 72.3% had none of the Mental Health Words, 15.5% had one, 7.3% had two, 3.0% had three, 1.2% had four, and .8% had five or more words. With fire/ES we had 64.6% calls with no words, 24.2% with one, 7.4% with two, 2.2% with three, .9% with four, and .7% with five.

The Mental Health Word count was used to stratify the police and fire/ES CFS into six levels (i.e., no words, 1, 2, 3, 4, 5 or more). Within each strata, we randomly selected cases for direct review of the remarks field. For example, with the police calls we randomly selected 2,246 calls from those that had none of the Mental Health Words, 2,042 calls from the subset with one word, 2,000 from those with two words, 2,001 from those with three words, 1,822 of the four words, and all 1,205 with five or more words. The same strategy was applied to the fire/ES calls, resulting in two final random stratified samples of 11,316 police and 4,453 fire/ES calls.

The benefit of randomly sampling cases from the entire population of CFS is that manually reviewing the narrative from 11,316 police was feasible within the scope of this project. Reviewing the narrative from 148,169 police CFS was not. Random sampling can provide a very accurate estimate of the "truth" from a full population of CFS, especially when the sample is large (i.e., > 2,000 cases). Moreover, stratifying the sampling procedure based on the number of Mental Health Words found in the narrative allowed us to be more efficient in our work. The base rate of mental illness/possible mental illness in CFS with no Mental Health Words was likely to be very small. That meant we would have spent a lot of time reviewing narratives that were unlikely to involve a mental health component.

Our next step was to ensure that the coding system described above could be reliably applied to the sampled CFS. Two raters independently coded 327 police call narratives with 50 to 60 cases taken from each of the Mental Health Word strata. The percentage of agreement between the coders was calculated and the reliability of this system was tested using Cohen's *Kappa* (Cohen, 1960). This statistic computes the proportion of agreement achieved after factoring in the agreement expected to occur by chance alone.

The first inter-rater reliability analysis looked at agreement using the three-level mental health variable (i.e., Pw/MI, Poss/MI, and Unrelated). The two raters assigned the same code 89.3% of the time, generating a Kappa of .81. This would be deemed "very good" inter-rater reliability by Landis and Koch (1977). We then dichotomized the variable by combining Pw/MI and Poss/MI into a single level (i.e., Pw/MI or Poss/MI vs. Unrelated). With the dichotomous rating, the level of agreement increased to 93.2% with a Kappa of .86. These findings indicate that the coding system we developed could be consistently applied to Gresham's CFS.

We then proceeded with our manual review of the 11,316 police and 4,453 fire/ES calls from the stratified random sample. This involved reading the combined narrative from the remark fields and classifying the calls using the 3-level variable described above. The results of this coding are shown in the table below (see first five columns). For example, with the police CFS we reviewed all 1,205 calls that had five or more Mental Health Words from our list. Within this subset, we classified 608 calls as Pw/MI, 447 as Poss/MI, and the remaining 150 were tagged as unrelated to mental health.

Mental Health Involvement in Gresham's CFS (2016 to 2017)

# MH Words	RANDOM STRATIFIED SAMPLE OF CFS				ALL CFS[a]			
	Total	PwMI	Poss/MI	Unrelated	Total	PwMI	Poss/MI	Unrelated
Police								
0	**2,246**	1	19	2,226	**107,057**	48	906	106,104
1	**2,042**	68	287	1,687	**22,893**	762	3,218	18,913
2	**2,000**	132	669	1,199	**10,758**	710	3,599	6,449
3	**2,001**	294	893	814	**4,433**	651	1,978	1,803
4	**1,822**	465	858	499	**1,823**	465	858	499
5+	**1,205**	608	447	150	**1,205**	608	447	150
Total	**11,316**	**1,568**	**3,173**	**6,575**	**148,169**	**3,245**	**11,006**	**133,919**
Fire								
0	**1,004**	0	5	999	**21,668**	0	108	21,560
1	**1,190**	14	76	1,100	**8,117**	95	518	7,503
2	**1,001**	65	247	689	**2,479**	161	612	1,706
3	**746**	72	337	337	**746**	72	337	337
4	**289**	61	174	54	**290**	61	175	54
5+	**223**	81	120	22	**223**	81	120	22
Total	**4,453**	**293**	**959**	**3,201**	**33,523**	**471**	**1,870**	**31,183**

[a]Estimates for PwMI, Poss/MI, and Unrelated based extrapolation of findings from random sample.

The findings from the stratified random sample were then applied to the full set of police and fire/ES calls in our database. This involved calculating the percent of calls in the random sample that were mental health related and applying this to the full set of calls. For example, 132 calls in the stratified random sample of two Mental Health Words were classified as Pw/MI. This meant that 6.6% of the calls in this stratum (132 / 2,000) involved a person with a mental illness. When this figure (6.6%) was applied to the full set of cases with two Mental Health Words (n = 10,758), it generated an estimate of 710 cases.

The totals across the Mental Health Word strata are what we present in the results section. For example, we estimate that 3,245 of the 148,169 police CFS (2.2%) involved a Pw/MI and 11,006 calls (7.4%) involved Poss/MI. When combined, this amounts to 14,250 calls that involved a Pw/MI or Poss/MI (9.6%).

Given the importance of the combined narrative field in generating our findings, we think it necessary to share a few observations and caveats about this information. First, most of the narratives were quite short. The average number of characters for police calls was 105 and 48,829 calls (33.0%) had 15 or

fewer characters.[12] Fire/ES department narratives were on average shorter at 84 characters (624 or 1.9% under 15). Provided below are sample narratives at or near the average length for each agency [note the vertical "|" demarcates the three text fields we merged]:

- "20/F, CONS, BR, SAYS SHE CUT HER LEG W/ A RAZOR, FEELING SUICIDAL || RAZER" [police CFS with 102 characters]

- "MALE IN APT YELLING AND SCREAMING, BANGING ON STUFF W/ BASEBALL BAT, HM, 30S, 5 04, SLIM, UNK CLOTHING ||" [police CFS with 108 characters]

- "4 JUVS WALKING THRU PKT LOT MAKING THRETS TO BEAT UP COMP, UNK REASON. STILL HERE CONFRONTING COMP. ||" [police CFS with 105 characters]

- "SLIGHT LANG BARRIER, 63 YO FEM, CONS AND BR, CANCER PT, SHARP PAINS IN STOMACH, FEVER||" [fire CFS with 87 characters]

- "MODULE D, 2ND HAND TO COMP, M70, CONSC, BR OK, HAD A FALL IN LOBBY, IS CONFUSED||" [fire CFS with 81 characters]

- "COMP'S 16 YO DOTR LOCKED HERSELF IN THE BATHROOM, THINKS OD'ING ON PILLS INTENTIONALLY||" [fire CFS with 88 characters]

The brevity of this narrative certainly makes sense from an operational perspective. Dispatch personnel see their primary goal as delivering police, fire/ES as quickly and efficiently as possible. Moreover, dispatchers and emergency responders work in a chaotic environment with significant time pressure and imprecise communication from the public. Their use of codes, acronyms and other colloquial phrases[13] helps to simplify the documentation process, as does restricting the overall length of the text entered into the CAD system.

As a source of data for research, however, these narratives have certain limitations. We could do little, for example, with the roughly 50,000 narratives that had fewer than 15 characters. It seems safe to assume that some portion of these CFS involved Pw/MI or possible MI, and these are not reflected in our estimates. Likewise, under ideal circumstances, dispatchers would document the presence or absence of mental health issues for every call (e.g., yes, no, unknown). This type of coding would allow us to differentiate between "no", "unknown", and "missing", the latter being applied post-hoc if none of the other boxes are checked. The importance of this approach is demonstrated with the sample data shown in the table below.

MH Involvement	Current Coding	Ideal Coding
Yes	10	10
No		60
Unknown		20
Missing or Blank	90	10

Our current approach to coding the narratives involved searching for mental health indicators in the available text. If we looked at 100 narratives, we might find that 10 had words suggesting some type of mental health involvement (e.g., psychotic, depressed, suicidal). Let us assume that the other 90 cases provided no mental health information. Our resulting estimate for mental health CFS would be 10% (10 divided by 100).

[12]Based on the combined narratives after redaction of identifying information.
[13]For instance, "1234" is a code dispatchers use locally to identify situations involving a mental health component.

If dispatchers consistently documented the presence or absence of mental health in CFS narratives, we might have the distribution shown in the right-hand column of the table. These data allow us to adjust our denominator by removing the missing cases and those the dispatchers coded as "unknown". The result is that our estimate of mental health involvement in CFS rises to 14.3% (10 divided by 70).

In short, estimates of mental health involvement based on call narratives alone come with some important caveats. There are likely to be many false negatives, where our narrative review incorrectly assumed that a call did not have a mental health component when in reality, it did but this was not documented in the text. This is particularly true for the nearly 50,000 CFS that had a narrative with fewer than 15 characters. False positives are also possible, where we found Mental Health Words documented in the narrative, but no one involved in the incident was actually mentally ill. Nevertheless, based on our own experiences in the field, we believe that the former outnumber that latter by a large margin.

Appendix C – Methodology for CAD Codes

Our second strategy for estimating mental health involvement in Gresham's CFS relied solely on existing discrete codes used in the CAD system. Mirroring the classification system noted above, we used these codes to categorize each call into a three-level mutually exclusive variable: Pw/MI, Poss/MI, and Unrelated to mental health.

The first CAD feature we used for classifying calls was the police department's "study codes". Dispatchers and officers entering a police record into the CAD system can "tag" incidents with up to two descriptive codes[14]. Three of the available codes pertain to the mental health functioning of the people involved: alcohol involvement (OH), drug involvement (DG), and mental health influence (ME). Unfortunately, the study codes were not consistently available until September 1st, 2016. As a result, we restricted all of our remaining estimates to the subset of CFS from this date forward. This reduced the police sample to 98,489 CFS. For the sake of consistency, we applied the same date restriction to all of our subsequent analyses of fire/ES calls, dropping that sample to 22,690 incidents.

The second CAD data element used in classifying calls was the final case type. Dispatchers and officers use this field to describe the primary nature of the incident after it is resolved. As noted previously in this report, there were 309 different codes used by for this purpose during the study period. Some are specific to police incidents; others pertain solely to fire/ES calls. We used two codes from each agency for coding the presence or absence of mental illness.

For the police we included calls that were closed with DUII (driving under the influence of intoxicants) and those coded SUICD (suicide attempt or threat). Our decision to include DUII in our coding was based on a review of the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5). Continued use of a substance in potentially dangerous circumstances, like driving a motorized vehicle, is one of the criteria used in diagnosing substance use disorders. Likewise, while not all of the people who attempt or threaten suicide are mentally ill, there is a very strong association between acts of self-harm and many of the mental disorders in the DSM-5 including major depression, substance use, bipolar illness, PTSD, borderline personality disorder, and schizophrenia (Arsenault-Lapierre, Kim, & Turecki, 2004; Braadvik, 2018) .

Dispatchers do not use these same codes (i.e., DUII & SUICD) in closing Fire/ES CFS, but there are two fire/ES codes that appear to have a strong mental health connection: Behavioral and Overdose. To illustrate this connection we provide several sample calls for each final call type below:

- "COMPS 10Y HAS ADHD, BEHAVIOR DISORDERS, DEV ISSUES....CURRENTLY BREAKING THINGS AND YELLING, COMP WANTS HIM TO GO TO HOSPITAL AND GET MEDICATED.....WIFE IN BACKGROUND YELLING AT COMP.....M, 10, AWAKE/ALERT, BR OK||" [Behavioral]

- "80 YROLD F YELLING AND THREAT SUICIDE BEING PHYS VIOLEN, HAS TWO RIFLES AND A PISTOL, UNK WHERE IS PISTOL, RIFLES IN CLOSET, SON OF WOMAN HAS HER RESTRAINED||" [Behavioral]

- "M 52, UNCONS, DIFF BRTHING, TOOK BUNCH OF PILLS AND ALCOHOL TO HURT HIMSELF"

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[14] The study codes are not used with fire/ES CFS.

- (Overdose) "F13, CONSC, BR OK, DROWSY, OVERDOSE ON TRAZADONE AND MELATONIN , INTENTIONAL||" [Overdose]

- "F SAYS SHE IS SUICIDAL, DRINKING HERSELF TO DEATH.....SAYS SHE HAS OD ON ALCOHOL....NOT COHERENT......F, 64, CONSC/ DK||" [Overdose]

A third source of information for classifying incidents using CAD codes came from cross-referenced fire/ES and police calls. A cross-referenced case happens when police and fire/ES both respond to the same incident.[15] In the current dataset, 13.7% of fire/ES CFS included some degree of involvement with Gresham police officers. Police calls were considerably less likely to involve the GF&ES (.2%).

When coding the presence/absence of mental illness in police calls we looked at the final case type used for any cross-referenced fire/ES calls (i.e., Behavior, Overdose). Similarly, when coding mental health involvement in fire/ES calls we looked at the final case type (i.e., DUII, SUICD) and study codes (i.e., Alcohol, Drug, Mental Health) of cross-referenced police calls.

Using these three CAD elements, we categorized all of the police and fire/ES calls from September 1st 2016 to the end of 2017. Provided below are the details regarding how this information was used to classify each incident. Slightly different approaches were used for each agency.

Police CFS
- **Person with Mental Illness (Pw/MI)** – The ME (mental health influence) study code was applied, indicating some type of mental health involvement for the given CFS.
- **Person with Possible Mental Illness (POSS/MI)** – Any of the following conditions were true and the ME code above was not flagged:
    o The final case type was "Suicide" (e.g., SUICD, SUICDW, JUMP, MCCL)
    o The final case type was DUII
    o The study code for Drug involvement (DG) was applied
    o The study code for Alcohol involvement (OH) was applied
    o The cross-referenced fire/ES case, if applicable, had a final call type of "Overdose" (OD3, OD4, OD8, OD9)
    o The cross-referenced fire/ES case, if applicable, had a final call type of "Behavioral" (BE3, BE4, BE8, BE9)
- **Unrelated to Mental Health** – None of the above conditions were met.

Fire CFS
- **Person with Mental Illness (Pw/MI)** – The ME (mental health influence) study code was used on a cross-referenced police CFS, indicating some type of mental health involvement.

- **Person with Possible Mental Illness (POSS/MI)** – Any of the following conditions were true and the ME code above was not flagged:
    o The final fire/ES case type was "Overdose" (OD3, OD4, OD8, OD9)
    o The final fire/ES case type was "Behavioral" (BE3, BE4, BE8, BE9)
    o The final case type on a cross-referenced police call was "Suicide" (e.g., SUICD, SUICDW, JUMP, MCCL)

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[15] Cross-referencing can also happen when multiple fire/ES or multiple police agencies respond to the same event.

- o The final case type on a cross-referenced police call, if applicable, was DUII
- o The Drug involvement (DG) study code was checked for a cross-referenced police call
- o The Alcohol involvement (OH) study code was checked for a cross-referenced police call
- **Unrelated to Mental Health** – None of the above conditions were met.

This approach to categorizing mental health involvement in Gresham's CFS had the advantage of being much less time consuming than the prior strategy (i.e., stratified random sampling). We used existing fields from the CAD system and automated the scoring process using basic database queries and data transformations.

Our CAD methodology comes with several major limitations that we need to discuss. First, the fire./ES and police departments use different codes for classifying events and only the latter is using the mental health related study codes. This make comparison across agencies difficult. Second, unlike the narrative strategy described in the prior appendix, we could not directly assess whether dispatchers and officers use the CAD codes consistently. If two dispatchers review the same case and document them differently using the study codes and case types, we have a problem with inter-rater reliability. Unreliable data entry will invariably lead to inaccurate findings in aggregate analyses. This is not to say that dispatchers/officers are inconsistent – just that we have no way of directly testing this with the current data.

We also found many police cases where Mental Health Words were clearly present in the narrative of call, but the call was not flagged using the applicable mental health study codes. More specifically, there were 7,552 CFS narratives from Sept 2016 through 2017 that we manually reviewed for the stratified sampling procedure described in the prior appendix. Based on reading the narrative we classified 3,153 of these calls as either Pw/MI or Poss/MI. One or more of the mental health study codes (i.e., alcohol, drugs, mental health involvement) were applied to just 993 of these cases. In other words, the study codes were not used 68.5% of the time when we thought the narrative provided information that may have warranted their use. Provided below are several CFS demonstrating this issue with the most pertinent information highlighted using red text.[16]

- "PI LOC IS ADULT FOSTER CARE HOME, M 60S, CONSC, BR OK, DIARRHEA, ALSO PARANOID SCHIZOPRENIC, SCREAMING AND YELLING INSULTS AT CAREGIVER||"

- "SCHIZOPHRENIC SON LEFT LOC APPROX 3 HOURS AGO ON FOOT, [redacted], NOT VIOLENT, USUALLY AVOIDS PPL..IS OFF MEDS...WM BRN MULLET,WHT TSHIRT,POSS JEANS, NO I.D. ON HIM .COMP WANTS OFFICERS IN GRESHAM AND PPB AWARE IF CONTACTED||"

- "DOTR [redacted] MULT TIME RUNNER..WF, 15, 5'4, 150, LSW DK JKT, GRN BKPACK.... HX OF BIPOLAR AND CUTTING AND WAS SEEING THERAPIST FOR SUICIDAL THOTS. DOSN'T THINK SHE WAS HAVING SUICIDAL THOTS TONITE.||"

- "CHRONIC 1234 SOUNDING CALLER. SEZ HE IS VIC OF SEVRL ASSLTS, SEZ THE SGT TOLD HIM ON SATURDA HE'D BE GETTING A CALL OR TEXT FROM THE "CAPTAIN". DEMANDING TO SPEAK W/ A SGT OR OFCR AGAIN TODAY. PERHAPS A SGT CAN CALL HIM. | HIS NEIGHBORS YELLED VULGARITIES AT HIM WHEN HE TOOK OUT THE GARBAGE.|"

Similarly, the final case types applied to both police and fire/ES calls has limitations when they are used to assess mental health involvement. During our manual review of police narratives, we identified 824

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[16] None of these calls were flagged with the mental health study codes.

incidents involving a suicidal act, threat, or a history of such behavior. Only 298 (36.2%) were closed with one of the suicide case type codes. It is entirely possible that these calls had other considerations that resulted in the application of a different final case code. It seems unlikely that this accounts for all of the discrepancies we found.

The Kappa coefficients resulting from the comparison of the CAD code approach versus the stratified random sampling review were .59 for fire/ES CFS and .38 for police CFS ("weak" to "minimal" agreement). The most common type of disagreement for both agencies occurred when our manual review of the narrative suggested a mental health involvement but the CAD coding approach classified the call as unrelated to mental health. These figures highlight the different classification resulting from these two approaches.

Again, this is not meant as a critique of the dispatchers and officers entering this information. They work under difficult conditions with considerable pressure to move rapidly from one call to the next. Categorizing calls after they clear and consistently applying study codes are probably not salient aspects of a successful day at the office or patrol shift. Instead, our goal here is to highlight how use of these data elements to quantify mental health involvement in CFS comes with major caveats. We believe that the widespread use of these or similar discrete codes in prior research studies has led to underestimates of the true prevalence of mental illness in police and fire/ES CFS.

Appendix D – Methodology for Mental Health (MH) Words

Our third methodology sought to automate the identification of mental health related CFS using a simple word-based algorithm. We started by parsing all of the individual words from the 11,316 police and 4,453 fire/ES calls coded for the stratified random sample (see Appendix B)[17]. This process resulted in several million records, or individual words that could be connected to their original CFS and the classification we did for that incident (i.e., Pw/MI, Poss/MI, Unrelated). We then counted how frequent each word was in this data set and dropped all of the words that occurred fewer than 20 times. This helped us to eliminate any of the personal names, addresses, etc. that remained in our data after redacting what we could.

Next, we assessed how useful each of the remaining words was in differentiating CFS with a mental health component (Pw/MI or Poss/MI) from those without (Unrelated). For example, 97.4% of the time when the word "schizophrenia" was found in a call narrative, we coded that incident as Pw/MI or Poss/MI. When the word "alcoholism" was present, the incident was classified as Pw/MI or Poss/MI 90.9% of the time. By contrast, the word "arguing" was only associated with Pw/MI or Poss/MI for 21.1% of the cases. This means "arguing" had less utility in correctly classifying mental health calls than "alcoholism".

We used this analysis to identify roughly 400 words that we thought would be helpful in identifying mental health related CFS. Some of these words are highly specific to local dispatchers (e.g., "1234", "55"). Others are unique to local service providers who respond to mental health crises. For example, the individual words "Project" and "Respond" were useful because they indicate that Project Respond was involved in the call. They are a mobile crisis team that handles high psychiatric risk events in the community.[18]

Some of the words in our list had a close connection to mental health, but they created false positives. The word "panic" is a good example. On the mental health side, this could be useful in identifying people with a "panic disorder" or those experiencing a "panic attack". Because we only looked at individual words, however, inclusion of this word would have led to "panic alarms" being incorrectly classified as mental health calls.[19]

Through a process of trial and error, we narrowed our list down to 385 words. We then added 34 additional words that represented spelling variants for some of the more critical items. Suicide for example had 12 variants in our narrative data (e.g., sui, suicdal, suicde, suicide). The final list we used for the procedure detailed below was 419 words. Note that many, if not most, of these words are also found on the earlier word list used in our stratified random sampling procedure (see Appendix B).

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[17] This process required several preliminary steps to prepare the narratives. This included removing all punctuation and special characters leaving behind a space that would be used to parse the data. Numbers, pronouns, conjunctions, determiners, and other unwanted characters were removed in a similar manner.

[18] Interestingly, the words "Patriot" and "Versa" also appeared on our list. These were makes of cars commonly used by local crisis service providers and dispatchers sent this information to officers via the CAD system.

[19] The word "panic" was retained in the coding process described below by only including it when the call type was something other than an "Alarm".

Our next step was to group these 419 words into 10 distinct categories. The categories, descriptions of the categories, and sample words are provided in the table below. The full list of words is available upon request.

Category	Description	Examples
Specific Disorders	Words identifying a specific mental disorder	Alcoholism, Autism, Bipolar, Delusional, Depressed, Manic, Paranoid, Psychosis, Schizophrenia
General Disorders	Non-specific words/phrases/short-hand used to reference mental illness	1234, Breakdown, Crazy, Disorder, Psych, Syndrome
Crisis	Words suggesting a mental, emotional, or behavioral crisis	Agitated, Amped, Distraught, Erratic, Escalate, Lethargic, Rambling, Sobbing, Unresponsive, Unstable, Worried
Aggressive Actions	Words associated with aggression or hostility	Abused, Angry, Attacking, Chasing, Disruptive, Threatened, Slashed, Smashing, Threat, Violent, Yelling
Risk for Self-Harm	Words associated with a risk for self-harm	OD, Hotline, Overdosing, Suicidal, Suicd
Possible Risk for Self-Harm	Words suggesting possible risk for self-harm.	Himself, Herself, Ideation, Plan, Risk, Unsafe, Swallowed, Wrist
Mental Health Providers	Words associated with the provision of mental health services	Caregiver, Cascadia, Client, ECIT, Halfway, Project, Respond, Therapist
Substances	Words linked to substances and/or medicine	Alcohol, Crack, Dope, Drug, DUIII, High, Intoxicated, Marijuana, Meds, Meth, Withdrawal
Weapons	Words associated with weapons	Armed, Blade, Gun, Machete, Razor, Scissors, Weapon, Wpns
Non-specific Words	Words that did not cleanly fit in another category	Acting, Checking, History, Symptoms, Thoughts, Voluntary, Welfare

Our list of Mental Health Words was then used in classifying the narratives from the 98,489 police and 22,690 fire/ES incidents spanning September 2016 to the end of 2017[20]. We used the same timeframe as the CAD coding process covered in Appendix C to ensure comparability across methodologies. Similarly, we used the same three-level mutually exclusive variable to categorize each incident: Pw/MI, Poss/MI, and Unrelated. Our approach to coding this final variable is detailed below:

- **Person with Mental Illness (Pw/MI)** – The CFS narrative had at least one word from the *Specific Disorders* list or the *General Disorders* list (see table above).
- **Person with Possible Mental Illness (POSS/MI)** – Any of the following conditions were true and the criteria in the option above were not met:
    - The call narrative contained at least one word from the *Mental Health Provider* list.
    - At least one word from the *Risk for Self Harm* was present in the call narrative
    - The call narrative contained at least one word from *Possible Self-Harm* **-and-** at least one word from the *Aggressive Actions* list (e.g., "slashed" and "wrist").
    - The narrative contained at least one word from *Substances* **-and-** at least one word from the *Aggressive Actions* list (e.g., "alcohol" and "yelling").

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[20] In actuality, we used just the first eight mental health word categories in our coding. The *Weapons* category produced a high number of false positives because dispatchers often document "no weapons reported" or "unknown weapons". Recall that we look at each word in isolation. Similarly, the *Non-Specific Word* list ended up being too non-specific, and failed to be of benefit when identifying mental health related CFS.

- The narrative contained at least one word from *Substances* **-and-** at least one word from the *Crisis* list (e.g., "intoxicated" and "rambling").

- **Unrelated to Mental Health** – None of the above conditions were met.

Comparisons between this approach to classifying calls and our stratified random sampling technique produced higher rates of agreement than we saw with the CAD coding procedure (see Appendix C). The Kappas were .72 and .73 for fire/ES and police CFS respectively ("moderate" agreement). The higher rate of agreement here is largely driven by the similarity between these two methods - they were both based on reviewing the call narrative to look for pertinent information. One approach involved manually reading each narrative (i.e., stratified ransom sample), while the other automated the process using a list of mental health related words (i.e., Mental Health Word).

Despite the similarity between these two methods, there were still cases where CFS were classified differently. The following cases demonstrate how Mental Health Word strategy may have generated false positive "hits" due to the specific words used or combination of words[21]. The key words that produced the error are shown in red text and the applicable criterion from above is presented in brackets at the end of the narrative.

- "IN THE PK LOT. TO COMPS PRKD VEH. WTG BY A GRN JEEP PATRIOT. POSS SUSP INFO. | WILL TRY TO DO INFO EXCHANGE AND IF THAT DOESN'T WORK, WILL REPORT HIT AND RUN AS OTHER HALF MIGHT NOT BE COOPERATIVE|" [*Mental Health Provider*]

- "2 SUBJS LOITERING IN FRONT LOC/COMPS NEIGH.. NEIGH NOT HOME.. WHEN ASKED WHAT THEY WERE DOING THEY DID NOT RESPOND.. 2 WM OR HM, E20S, BLK HOODIES/COATS, PANTS | |" [*Mental Health Provider*]

- "SENDING POLICE TOO, COMPL IS CALLING FOR HER DAD, MALE IN HIS MID 50'S, SEVERELY DIABETIC, DOESN'T REGULATE HIS INSULIN, TONGUE IS SWOLLEN, CAN'T SEE, DOESN'T WANT COMPL TO CALL EMS FOR HIM AND THUS IS VERY ANGRY AND YELLING, UNK IF LOW OR HIGH BLD SUGAR ...SEE RELATED FIRE CALL RG16-xxxxx-DP8, ANGRY DIABETIC PT, MALE IN HIS 50'S, YELLING | AMR TO TRANSPORT NOW COOP SUBJECT|" [*Aggressive Actions and Substances*]

- F SLEEPING AT THE TABLE....REF TO LEAVE, ...NOT DK/HI, COVERED IN BLANKET, PINA | MOVED ALONG|" [*Aggressive Actions and Substances*]

- 1 AGO, MALE IN TOY WHT PU xxxxxxx/OR PLT DRIVING AGGRESSIVELY, ERRATIC LANE CHANGES, FLIPPING PPL OFF AND FLASHING HIGH BEAMS AT PPL | |" [*Aggressive Actions and Substances*]

- "I/S LOC, COMP SAYS HER BROTHER IS HERE AND HAS WARRANT. WAS BEING VIOL EARLIER, KEEPS FORCING HIMSELF INTO THE HOUSE. [redacted] UNK IF WEAPS. | FOLLOW UP REPORT DONE ON ORIGINAL 17-xxxxx|" [*Aggressive Actions and Possible Self-Harm*]

Likewise, our Mental Health Word strategy produced possible false negatives (i.e., "misses") when compared to our manual review of randomly selected cases (i.e., stratified random sample). This happened when the former approach classified the call as being unrelated to mental illness, but the latter put the call into the Pw/MI or Poss/MI category. Several examples are provided below along with a brief explanation for the discrepancy.

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[21] We use "may have" here because we do not know what the actual truth is for these incidents or which strategy was correct.

- "COMP CALLING TO TRANSLATE FOR PARENTS, WANTS TO RPT 15YO BRO AS RUNNER, HAS RAN BEFORE, NOT DANGER TO SELF OR OTHERS, ||" [running away not included in mental health word strategy due to complexity of determining repetition of behavior]

- "COMP BORROWED PH TO CALL, SAYS THERE ARE 3 DRUG ADDICTS INSIDE HIS APT RFSNG TO LV, HE WILL WAIT OUTSIDE FOR POL, HE SOUNDED A BIT DK AND TOLD ME HE HAD HAD 3 BEERS ||" [not picked up due to atypical spelling of refusing to leave]

- "CKING ON COMPS DAD, [REDACTED NAME] COMP HAS NOT HEARD FROM HIM SINCE CHRISTMAS WHICH IS VERY UNUSUAL. HX OF 'GOING MISSING AROUND THIS TIME BECUZ OF SOME PAST EVENT THAT UPSETS HIM' BUT COMP COUDN'T ELABORATE. LIVES WITH GFRIEND xxxx. NO ASSOC||" [possible PTSD not detected]

- "IN PARKING LOT,.... DRIVER I/S VEH APPEARS TO BE INTOXICATED, SMELLED LIKE ALCOHOL,... GRN/HI MOTORHOME xxxxxx/ ||" [substance use not combined with aggressive behavior or terms suggesting crisis]

- "CK ON [redacted], WF, xxxxx, TALKING BOUT OD'G, NO IDEA IF SHE HAS NETHING AVAIL, POSS HX OF SAME. COMP IS DAD BUT HASNT BEEN IN CONTACT FOR YRS. BELIEVES SHE LIVES ON SW xxTH ||" [missed overdose due to unique spelling]

- "1AGO, PER CUST, XIENT FEM LAYING ON THE GROUND IN THE CORNER TWEEN LOC AND TJ'S CAFE, COMP THINKS IS POSS HI AND TWEEKING, FEM IN CAMO JKT WITH HOOD UP AND GRN PANTS, NO WEPS SEEN ||" [included in stratified random sampling because of drug use and unusual behavior in public setting]

- "ELDERLY CALLER SAID HER SON WAS RLSD FROM OR STATE HOSP AND WAS SUPPOSED TO RPT TO A GRP HOME BUT RAN AWAY INSTEAD, COMP WAS TOLD TO RPT HIM MISSING BUT SHE HASN'T YET, HE CALLED HER 20 AGO FROM HERE, LOC IS HIS SISTER'S HSE, THE CALLER MAY BE CONFUSED BUT ALSO SAID THAT HE IS WAITING FOR A RIDE NOW AND WANTS TO GO TO GRP HOME, SETTING UP A CALL ||" [included in stratified random sampling because of reference to state hospital]

Additional programming efforts with the Mental Health Word strategy could further reduce some of these false negative errors (assuming the manual review correctly classified the cases). This includes the use of fuzzy logic to address differences in spelling terms, consideration of 2 and 3-word combinations rather than single words, and sophisticated algorithms used in natural language processing.

Appendix E – Methodology for Combined Approach

Our final approach to categorizing CFS into three levels (i.e., Pw/MI, Poss/MI, Unrelated) combined the CAD code strategy with the Mental Health Word approach. As noted in the prior appendices, both strategies had important limitations. We believe that these limitations are partially mitigated by merging the two methods.

First, it is interesting to note that our estimates of mental health involvement are nearly identical across these two methodologies, particularly for police calls. Of the 98,489 police CFS examined, 7,199 (7.3%) were classified as Pw/MI or Poss/MI using the CAD code approach (i.e., mental health related). The Mental Health Word strategy put 7,211 (7.3%) calls into the same category. The respective figures for fire/ES CFS were 1,296 (5.7%) and 1,676 (7.4%).

A closer examination of these data finds that the two strategies did not consistently classify the <u>same</u> calls as mental health related. There were 11,657 police CFS that were flagged as mental health related by at least one of the two approaches. Only 2,753 (23.6%) of these were judged to be mental health related by both strategies. Similarly, for fire/ES there were 2,275 calls that were coded as mental health related by at least one approach. Of these just 697 (30.6%) were classified this way by both methods. In short, there was poor agreement these two strategies, with respective Kappas of .33 and .44.

Much of the discrepancy between these two approaches can be attributed to a disconnect between the call narrative and use of the CAD study codes. We found many cases where one or two of the mental health study codes was applied (i.e., drug, alcohol mental health involvement), but the narrative did not document a clear mental health connection. The following sample CFS demonstrate this issue:

- "THRU LL /SPAN SPKR, FATHER OF CHILD IS O/S . HAS RO AGAINST HIM ,TRYING FOR MORE, PI SITE MAP||"

- "COLD. KNOWN SUSP HARASSING/STALKING COMP'S DOTR. | GAVE BUSINESS CARD AND INC#.|"

- "SON PUSHED COMP INTO FRIDGE LAST NIGHT, IS NOW IFO OF LOC, THREATENING TO KILL HER, NOT KNOWN TO CARRY WEAPS....WM, 28, BLU JKT, BLU SHORTS||"

- "HOMLESS SUBJ SLEEPING BY DUMPSTERS, REF TO GET UP AND LEAVE. NORTH END OF BLKDING J. LOTS OF GARBAGE WITH HIM. WM,20'S, NO SHIRT. ||"

- "THINKS SUBJ TRYING TO BREAK INTO HER HOUSE. KEEPING ON THE LINE.||"

- "FEM BEING FOLLOWED BY MALE ON FT, WB ON BURN ON FT .. #1 WM,50S, RED FLANNEL SHIRT, HITTING FEM NOW||"

Similarly, obtaining agreement between these two methodologies is bound to be difficult when 32.2% (n = 31,716) of the police calls from September 2016 through 2017 had a narrative that was under 16 characters (e.g., "MAR CAMARO", "N SIDE", "090HUX", "WB LANE"). Given the lack of text to work with, it is not surprising that none of these cases were classified as mental health related using the Mental Health Word strategy. By contrast, 1,091 of these calls had one or more of the mental health study codes attached.

As noted previously, we also found a large number of cases that appear to involve mental health issues, but the alcohol, drug, and mental health study codes were not used (see examples below). These cases were coded as mental health related using our Mental Health Word methodology.

- "1 AGO, VERY HI MALE HERE RUNNING AND JUMPING AROUND, ACTING ABNORMALLY, NOT VIOLENT, JUST SEEMS LIKE HE NEEDS TO BE CHECKED, PREVIOUSLY GOT OUT OF A VEHICLE THAT IS IN PARKING LOT, BLK HONDA CIVIC||"

- "M49, HX OF MENTAL ISSUES, THINKS PARASITES ARE GROWING ON HIM, BEING VIOLENT , COMP SAYS NO DRUGS | SUBJECT REFUSED MEDICAL ATTENTION AND IS NOW SLEEPING|"

- "IND. FEM, 31, CONS, BR OK, CURRENTLY GOING THRU SHIZO 1234 EPISODE, HITTING HERSELF IN THE HEAD W/ HER FIST. PD AND MED GOING.||"

In summary, our experience analyzing these data suggests that both strategies generate a high number of false negatives, where CFS are incorrectly labeled as unrelated to mental health. Combining the two approaches may help alleviate some of this problem.[22] This was achieved by coding all of the police and fire/ES CFS using the following system:

- **Person with Mental Illness (Pw/MI)** – The CAD **–or–** Mental Health Word coding strategy labelled the case as Pw/MI.
- **Person with Possible Mental Illness (POSS/MI)** – The following conditions were both true:
  - The Pw/MI conditions above were <u>not</u> met
  - The CAD **–or–** Mental Health Word coding strategy labelled the case as Poss/MI
- **Unrelated to Mental Health** – None of the above conditions were met.

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[22] The opposing risk is that combining these approaches will lead to more false positives, where calls that are (truly) unrelated to mental illness are incorrectly classified as mental health related. Experience in the field suggests, however, that emergency personnel are cautious in labelling someone as mentally ill, leading to underreporting rather than over reporting.

Appendix F – Online Survey Form

Portland State University (PSU) is collaborating with the City of Gresham to document the prevalence and impact of mental illness in police and fire calls for service. The findings from this research will be used to help Gresham develop better policies and procedures for responding to calls involving mental health.

Your experience and observations as a police officer are critically important. We want to know how often your calls for service involve people who are mentally ill or experiencing a behavioral crisis. We are also interested in your opinions about how the City should respond to these incidents.

We hope you will take 10-15 minutes to complete an online survey. The survey is anonymous: we do not ask for any information that would allow you to be personally identified. The survey is also voluntary. Even if you initially choose to participate, you can withdraw at any time or skip questions that make you uncomfortable.

Our questions about your recent calls for service include things like: a) Did the call involve anyone with a possible mental disorder?; b) How many people responded to the call?; and c) How much time did it take to clear the call? We do not foresee any harm that might result from answering these questions. Nor are there any direct benefits to you, other than the hope that Gresham will make changes based on the findings.

You can start the survey by 'clicking' NEXT below.

Please contact Dr. Kris Henning, the Principal Investigator, if you have questions about the research (khenning@pdx.edu or 503-725-8520). You can print this page from your web browser if you wish to keep a copy this contact information.

This survey, along with other data sources, is being used to estimate the proportion of GPD's (GPD) calls for service (CFS) that involve people with possible mental illness. This includes people involved as a complainant, suspect, person of interest, victim, or witness.

For the purpose of this survey, all of the following situations would be defined as a CFS involving **possible mental illness**:

- Someone reported they or another person involved has a mental disorder (e.g., PTSD, depression, dementia, autism, schizophrenia, bi-polar, alcoholism, drug dependence).
- Someone involved has a history of mental health problems, but the specific disorder was not disclosed (e.g., "Long history of mental illness").
- Someone involved has a history of self-harm or threatening self-harm (e.g., "Hx of suicide attempts", "Attempted suicide last month").
- Someone involved is under the care of professionals who support people with mental illness (e.g., group home, psychiatrist, psychologist, psychiatric hospital).
- Someone involved engaged in unusual behavior that suggested a mental health crisis (e.g., crying in public with no obvious cause, talking to self, yelling at strangers, wandering into traffic, harassing people in a store, taking clothes off in public).
- Someone involved was under the influence of alcohol/drugs and engaged in problematic behavior (e.g., DUI, refusing to leave location, harassing people, fighting, theft, vandalism, risky behavior).
- Someone involved hurt, threatened to hurt, or was thinking about hurting themselves (e.g., "cut wrist", "posted on FB that he was going to kill himself").
- Someone involved overdosed on alcohol or illicit drugs.   Also include CFS where you think that a person involved is experiencing a mental health crisis or has a mental disorder.

This section of the survey asks about calls for service (CFS) that you cleared over the past 90 days. We want to know what proportion of these calls involved a person with **possible mental illness** (as defined above).

How many CFS did you clear over the past 90 days?

○ None

○ 1 to 19

○ 20 to 49

○ 50 to 99

○ 100+

What <u>percent</u> of these CFS involved a person with a person with **possible mental illness**?

0   10   20   30   40   50   60   70   80   90   100

'Click' and drag slider to select % ()

These two questions are just for the CFS you cleared in the past 90 days that <u>involved</u> a person with **possible mental illness**.

How many emergency personnel (e.g., police, fire, EMT) typically responded to these calls?

○ 1 - just you

○ 2 people

○ 3 people

○ 4 people

○ 5 people

○ 6 or more people

What was **your** average time spent on these calls (i.e., minutes from initiating call to cleared)?

0   120   240

'Click' and drag slider to select minutes

These two questions are just for the CFS you cleared in the past 90 days that <u>did not involve</u> a person with possible mental illness.

How many emergency personnel (e.g., police, fire, EMT) typically responded to these calls?

○ 1 - just you

○ 2 people

○ 3 people

○ 4 people

○ 5 people

○ 6 or more people

What was **your** average time spent on these calls (i.e., minutes from initiating call to cleared)?

	0	120	240
'Click' and drag slider to select minutes			

The next set of questions ask you to report details on the FIVE most recent CFS that you cleared (dispatched or self-initiated).

Did you clear at least 5 CFS in the past 90 days, either dispatched or self-initiated?

○ No

○ Yes

Call #1 (your most recent CFS)

Was the call self-initiated or generated by dispatch?

○ Self-Initiated

○ Dispatched

Did the call involve a person with **possible mental illness**?

○ No

○ Yes

How many emergency personnel (e.g., police, fire, EMT) responded to this call?

○ 1 - just you

○ 2 people

○ 3 people

○ 4 people

○ 5 people

○ 6 or more people

How much time did **you** spend on this call (i.e., minutes from dispatch/self-initiation to cleared)?

	0	120	240
'Click' and drag slider to select minutes			

Call #2 (your second most recent CFS)

Was the call self-initiated or generated by dispatch?

○ Self-Initiated

○ Dispatched

Did the call involve a person with possible mental illness?

○ No

○ Yes

How many emergency personnel (e.g., police, fire, EMT) responded to this call?

○ 1 - just you

○ 2 people

○ 3 people

○ 4 people

○ 5 people

○ 6 or more people

How much time did **you** spend on this call (i.e., minutes from dispatch/self-initiation to cleared)?

0   120   240

'Click' and drag slider to select minutes

Call #3 (your third most recent CFS)

Was the call self-initiated or generated by dispatch?

○ Self-Initiated

○ Dispatched

Did the call involve a person with possible mental illness?

○ No

○ Yes

How many emergency personnel (e.g., police, fire, EMT) responded to this call?

○ 1 - just you

○ 2 people

○ 3 people

○ 4 people

○ 5 people

○ 6 or more people

How much time did **you** spend on this call (i.e., minutes from dispatch/self-initiation to cleared)?

| 0 | 120 | 240 |

'Click' and drag slider to select minutes

Call #4 (your fourth most recent CFS)

Was the call self-initiated or generated by dispatch?

○ Self-Initiated

○ Dispatched

Did the call involve a person with possible mental illness?

○ No

○ Yes

How many emergency personnel (e.g., police, fire, EMT) responded to this call?

○ 1 - just you

○ 2 people

○ 3 people

○ 4 people

○ 5 people

○ 6 or more people

How much time did **you** spend on this call (i.e., minutes from dispatch/self-initiation to cleared)?

	0	120	240

'Click' and drag slider to select minutes

Call #5 (your fifth most recent CFS)

Was the call self-initiated or generated by dispatch?

○ Self-Initiated

○ Dispatched

Did the call involve a person with possible mental illness?

○ No

○ Yes

How many emergency personnel (e.g., police, fire, EMT) responded to this call?

○ 1 - just you

○ 2 people

○ 3 people

○ 4 people

○ 5 people

○ 6 or more people

How much time did **you** spend on this call (i.e., minutes from dispatch/self-initiation to cleared)?

	0	120	240
'Click' and drag slider to select minutes			

The next few questions ask you to compare CFS involving a person with **possible mental illness** with CFS that did <u>not</u> have a mental health connection.

Based on your experience, which type of CFS is the easiest to clear?

○ CFS involving a person with possible mental illness

○ CFS with no mental health connection

○ I do not think there is a difference

Based on your experience, which type of CFS takes more police resources?

○ CFS involving a person with possible mental illness

○ CFS with no mental health connection

○ I do not think there is a difference

Based on your experience, which type of CFS has the highest risk for use of force by officers?

○ CFS involving a person with possible mental illness

○ CFS with no mental health connection

○ I do not think there is a difference

Based on your experience, which type of CFS has the highest risk for officer injury?

○ CFS involving a person with possible mental illness

○ CFS with no mental health connection

○ I do not think there is a difference

Which type of CFS do you feel you are best qualified to handle?

○ CCFS involving a person with possible mental illness

○ CFS with no mental health connection

○ I am equally qualified to handle both types of CFS

Do you currently have the support needed to effectively handle CFS involving possible mental illness?

○ No - I do not have the support I need

○ Yes - I have the support I need

The next few questions address local trends in the criminal justice and mental health systems.   **Compared to when you started at GPD:**

....Do you see more, fewer, or about the same number of people with mental illness in your recent CFS?

○ Much fewer

○ Fewer

○ About the same

○ More

○ Much more

....Do patrol officers have more, fewer, or about the same resources available for dealing with people with mental illness?

○ Much fewer

○ Fewer

○ About the same

○ More

○ Much more

....Has the local criminal justice system's response to people with mental illness gotten better, worse or stayed about the same?

○ Much worse

○ Worse

○ About the same

○ Better

○ Much better

....Has the local mental health community's response to people with mental illness gotten better, worse or stayed about the same?

○ Much worse

○ Worse

○ About the same

○ Better

○ Much better

The next few questions address your experience with Crisis Intervention Training (CIT). Include similar training programs that covered skills for dealing with people experiencing a mental health crisis.

How many hours of official training have you received in CIT or related programs during your law enforcement career?

○ None

○ 1 to 19 hours

○ 20 to 49 hours

○ 50 or more hours

Has this training been helpful in managing CFS involving people with **possible mental illness**?

○ Not at all helpful

○ A little helpful

○ Moderately helpful

○ Very helpful

How could training like this be improved?

_____

_____

_____

_____

_____

What steps would you suggest to improve GPD's response to mental illness?

_____

_____

_____

_____

_____

We end with a few demographic questions that will allow us to describe the people who participated in the survey. Note that we have intentionally limited the range of options to ensure that you remain anonymous.

What is your gender?

○ Male

○ Female

○ Other

What is your race/ethnicity?

○ White: Non-Hispanic

○ Other

What is your rank in GPD?

○ Officer

○ Other

How long have you worked for GPD?

○ Less than 5 years

○ 5 to 9 years

○ 10 or more years