

ABSTRACT

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Title: Exploring a Mental Health Crisis: An Examination of Mental Health Arrests in Benton County, OR

Abstract Approved:

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Benton County, Oregon is presently experiencing a crisis level of police contacts with mentally ill suspects. The cause of this sudden increase is currently unknown and local law enforcement is not adequately equipped or funded to respond to this development. This report summarizes the recent literature on law enforcement encounters with and responses to the chronically and severely mentally ill and relates it to the local context of Benton County. Quantitative analysis of local arrest data was conducted to determine the nature of the population of mentally ill suspects and attempt to identify causes of the recent increase in mental health arrests. While no community-level predictors of mental illness are found significant, a selection of potential alternative explanations are explored, a variety of future research hypotheses are presented, and a series of policy recommendations are made to address the crisis.

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Exploring a Mental Health Crisis: An Examination of Mental Health Arrests
in Benton County, OR

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TABLE OF CONTENTS

Introduction	1
Literature Review	2
The Mentally Ill	3
Police Challenges	5
Corrections Challenges	6
Federal Policy Developments	7
Local Policy Developments	8
CIT Training	9
Mental Health Courts	11
Summary	12
Local Context	13
Methods and Results	15
Data	16
Descriptive Statistics	17
Yearly Analysis	22
Monthly Analysis	27
Cross-Sectional Analysis of Arrests	30
Cross-Sectional Analyses by Suspect	33
Discussion	40
Conclusion	47
References	49
Appendices	53

LIST OF FIGURES

1. Non-POC and POC Arrests by Year	23
2. Unemployment Payments and Homeless Counts by Year	24
3. BCSO and CPD POC Arrests by Year	25
4. 2+ POC and Single POC Arrests by Year	26

LIST OF TABLES

1. Descriptive Statistics for Arrests in Benton County by Year, 2007-2012	17
2. Descriptive Statistics for Arrests in Benton County by Month, 2007-2012	19
3. Descriptive Statistics for Arrests in Benton County, 2007-2012	20
4. Descriptive Statistics for Arrested Suspects in Benton County, 2007-2012	21
5. Descriptive Statistics for Suspects with 2+ POC Arrests, 2007-2012	22
6. Newey-West OLS Regression of POC Arrests by Month	29
7. Logistic Regression of Likelihood of POC Charges by Arrest	31
8. Logistic Regression of Likelihood of POC Arrests by Suspect	34
9. Logistic Regression of Likelihood of Any Drug Possession Arrest by Suspect	36
10. Logistic Regression of Likelihood of Non-POC Arrests by Suspects with POC	38

LIST OF APPENDIX TABLES

1. Appendix 1. Dummy Variables: Mental Illness Associated Violent Events	53
2. Appendix 3. Newey-West Regressions of First Differences of POC Arrests by Month	54

LIST OF APPENDIX FIGURES

1. Appendix 2. Count of Suspects with 2+ POC by Year	53
2. Appendix 4. POC Counts by Month	54
3. Appendix 5. Calls to Albany Police Department Tagged with "Mental", 2004-2012	55

Introduction

The Benton County Sheriff's Office (BCSO), in conjunction with the Corvallis Police Department (CPD) and Philomath Police Department (PPD), has recently reported a large increase in the incidence of police contacts with the mentally ill. In 2010, BCSO and CPD reported a combined 123 peace officer custodies (POCs)—arrests primarily for mental health reasons—which grew to 245 in 2012, and 2013 is on pace to continue this upward trend. Anecdotally, in meetings with the author and Oregon State University faculty, representatives from both the police departments also reported a proportional increase in informally-resolved police contacts with individuals with mental illness. The heads of these local law enforcement agencies have jointly described these recent developments as a crisis. The causes and consequences, both monetarily and to public safety, of this drastic elevation are currently unknown, and this document presents an initial exploration of the potential causes and appropriate responses to this phenomenon. Furthermore, this document will serve as a starting point and empirical foundation for a continuing collaboration between researchers from Oregon State University, local law enforcement and mental health agencies, and other stakeholders.

To explore this area of concern, this document begins with a brief overview of the existent literature on police contacts with the mentally ill, including a review of modern policy approaches both nationally and at the local level; aggregate and individual explanations of the relationship between mental illness and law enforcement encounters are explored and responses are discussed and evaluated. Next, the local context of Benton County and the trend in mental-illness related arrests are described in depth. Then, longitudinal analysis of the last six years of arrests is conducted with variety of theory-driven aggregate predictors of mental illness rates and individual-level variables linked to frequency of police contacts are tested against cross-sectional

arrest data. Lastly, a discussion is provided of the implications of these findings for local stakeholders and a range of policy responses are proposed.

Literature Review

Disproportionate rates of arrest and incarceration of the mentally ill are becoming a concern of police, policymakers, and academic researchers throughout the United States (Reuland, Schwarzelfeld, & Draper, 2009). While the seriously mentally ill, those with mental illnesses that severely compromise unassisted living, comprise at most 5 percent of the general population, they are involved in between 7 and 10 percent of all police contacts (Franz & Borum, 2011) and may represent 25 percent or more of the U.S. prison and jail population (Lamb, Weinberger, Marsh, & Gross, 2007). At the national level, this overrepresentation in the justice system has been attributed to a variety of factors, ranging from deinstitutionalization—the dismantling of state mental hospitals in the 1960's—(Hartvig & Kjelsberg, 2009; Slovenko, 2012) to the war on drugs (Honberg & Gruttadaro, 2005; Lurigio, 2011; White, Chafetz, & Collins-Bride, 2006); as Europe and Canada, with substantially different health and policing policies, are experiencing similar challenges (Coleman & Cotton, 2010; Moore, 2010), identification of a single primary cause seems unlikely. While the root causes of the rise in mentally ill contacts with the criminal justice system are ambiguous, many researchers believe failures to coordinate local mental health, substance use, and criminal justice agencies are an important factor (Bernstein & Seltzer 2004; Honberg & Gruttadaro, 2005; Lurigio, 2011; Markowitz, 2011; Reuland et al., 2009). Accordingly, the primary focus of both policy and research on addressing mental health contacts with law enforcement has been on facilitating cooperation between local agencies and establishing institutions to divert the mentally ill away from corrections and into effective treatment (DeMatteo, LaDuke, Locklair, & Heilbrun, 2013;

Honberg & Gruttadaro, 2005; Litschge & Vaughn, 2004; Reuland et al., 2009; Watson et al., 2010b).

The Mentally Ill

While the mentally ill account for a disproportionate number of those arrested and incarcerated, research indicates that mental illness alone is a poor predictor of criminality (Reuland et al., 2009; Sims, 2009; Swartz & Lurigio, 2007); rates of arrest appear to be primarily driven by the high degree of comorbidity between mental illness and substance use, and the similarity in predictors of mental illness, substance use, and crime such as homelessness and poverty (Lurigio, 2011; Swartz & Lurigio, 2007). In particular, substance use appears to be the primary factor in predicting violence by the mentally ill (Reuland et al., 2009; Swartz & Lurigio, 2007) and may completely explain associations between mental illness and property and nonviolent crime (Swartz & Lurigio, 2007). In short, mental illness and criminality are distinct from one another, but mental illness is most common in those already at risk for substance use and criminality (Lurigio, 2011). While the relationship between mental illness and criminality is well understood in this fashion, the majority of police contacts with the mentally ill are driven by calls for service by citizens regarding non-criminal nuisance events and public disturbances—that is public displays of the symptoms of mental illness—and, accordingly, the mentally ill are disproportionately arrested for minor offenses such as disturbing the peace (Franz & Borum, 2011; Lurigio, 2011; Reuland et al., 2009).

This is not to say that there is not a danger of violence by the severely mentally ill. Research has found that those with schizophrenia and related disorders are at higher risk of committing violence and arson (Vinkers, Beurs, Rinne, & Hoek, 2011); one study estimated that

between 5 and 20 percent of homicides are committed by the seriously mentally ill, and approximately 40 percent of those by individuals without prior severe episodes, indicating that failures to address early symptoms of mental illness before may pose a public safety risk (Nielsen & Large, 2009). While relatively rare, the high costs of violence by the severely mentally ill necessitate effective policy responses due to the severe consequences to victims, suspects, and responding officers. Additionally, a strong connection has been found between untreated mental illness and intimate partner violence, with substance use again present as an aggravating factor (Cerulli, Conner, & Weisman, 2004; Lipsky, Caetano, & Roy-Byrne, 2011).

Although not the primary focus of this review, homelessness has been cited as a primary factor in high rates of mentally ill arrests, criminality, and victimization (Lurigio, 2011; Newman & Goldman, 2009; White et al., 2006). In particular, lack of appropriate housing significantly increases the public visibility of the mentally ill, contributing to arrests for nuisance acts (Markowitz, 2011) and is strongly linked to subsistence crimes, that is theft of food and trespassing to obtain shelter (Lurigio, 2011). Homelessness also negatively impacts participation in treatment programs and the ability of mental health services to locate clients (Hartford, Carey, & Mendonca, 2007). Accordingly, the provision of housing and residential treatment for the mentally ill, particularly those with comorbid substance use, is an important avenue of research and public policy that may be key to reducing rates of arrest and incarceration (Newman & Goldman, 2009). Existing research also indicates residential treatment may be significantly less expensive than incarceration while resulting in better mental health outcomes and subsequently lower rates of recidivism (Nelson, 2010; Quanbeck, Frye, Altshuler, 2003).

Police Challenges

Police officers interact with the mentally ill for two primary reasons: ensuring public safety and protecting vulnerable populations, that is addressing public concerns with behaviors associated with mental illness and connecting the mentally ill to appropriate mental health, substance use, and medical services (Charette, Crocker, & Billette, 2011). Both types of response to mentally ill persons have been found to be substantially more time consuming than other forms of police calls for service (Charette et al., 2011; Reuland et al., 2009). Additionally, in most communities a small subpopulation of the mentally ill, usually familiar to responding officers, is responsible for a disproportionately large number of calls for service and arrests and consumes substantial police resources in both time and money (Reuland et al., 2009). Even considering this large number of recorded police contacts, in areas with traditional approaches to mentally ill offenders, most calls for service involving mentally ill persons are resolved informally, thus going unrecorded and possibly contributing to significant underestimation of these costs while also producing missed opportunities for referral to proper treatment services (Charette et al., 2011; Reuland et al., 2009). It is notable that research has found police are substantially less likely to respond informally when contacts with the mentally ill involve either illicit substance use or violent threats or acts, indicating that informal resolution is unlikely to compromise public safety (Lord, Bjerregaard, Blevins, & Whisman, 2011).

Mentally ill persons are substantially more likely to be involved in fatal police shootings than members of the general population, presenting unique challenges to responding officers (Parent, 2008). Higher risks of violent contact with the mentally ill have ramifications for police as participation in violent encounters has been found to substantially negatively impact the mental health of responders (Komarovskaya et al., 2011); consequently, non-specialized

police responses to mental illness may have serious consequences for both mentally ill persons and responding officers. Research in New Zealand has also indicated that the mentally ill are disproportionately more likely to be targeted with less-than-lethal devices, such as the Taser, than the majority of offenders (O'Brien, McKenna, Thom, Diesfield, & Simpson, 2011).

Emerging police policies, discussed in the following sections, are addressing these factors with crisis de-escalation and force-reduction strategies that maximize the safety of both responders and mentally ill persons (Coleman & Cotton, 2010; Morabito et al., 2012; Reuland et al., 2009)

Corrections Challenges

As mentally ill persons are overrepresented in U.S. corrections facilities, this population presents a variety of challenges to these agencies, including the interrelated factors of high costs of incarceration, difficulties in provision of proper care, and high recidivism rates. Mentally ill persons impact prisons and jails financially through two primary mechanisms: longer, more frequent stays in correctional institutions (Bernstein & Seltzer 2004; Jones et al., 2011) and high costs of and barriers to providing proper mental health treatment (Cullen & Jonson, 2011; Hummert, 2011). As a point of comparison, one study found that typical costs of incarceration for the mentally ill are approximately ten times that of community-based treatment alternatives (Hummert, 2011). Both treatment and recidivism also present non-financial problems for corrections. As treatment is not the primary institutional goal of corrections facilities, it must necessarily be de-emphasized in favor of increasing safety and security, to the detriment of health outcomes of mentally ill persons (DeMatteo et al., 2013); some researchers have indicated that the inadequate treatment presented to the mentally ill and substance addicted may even stand in violation of the 8th Amendment, as determined in the Texas district court case *Ruiz v. Estelle* to guarantee adequate medical treatment of the incarcerated—potentially opening

corrections agencies to legal liability (Hummert, 2011; Lurigio, 2011). Lastly, inadequate treatment within correctional facilities and poor coordination with reentry services have been found to contribute to high rates of mentally ill recidivism (Hummert, 2011; Wynne & Jacques, 2011). This complicated interrelationship of factors highlights the difficulty in addressing mental illness within conventional correctional institutions; consequently most policies proposed to address corrections challenges focus on diverting the mentally ill away from prisons and jails and into treatment and social support programs (DeMatteo et al., 2013; Reuland et al., 2009; Wynne & Jacques, 2011)

Federal Policy Developments

While federal policies such as the war on drugs, low levels of social services, and deinstitutionalization have been cited as contributing to the profusion of mentally ill persons in the criminal justice system—and the brunt of social and financial harm from mental illness is borne on individual communities and local institutions—the federal government has taken an important role in the last fifteen years in fostering new approaches to criminal justice contacts with the mentally ill (Litschge & Vaughn, 2009; Lurigio, 2011; Rivera, 2004). In particular, the 2000 America's Law Enforcement and Mental Health Project act established federal funding for community mental health courts, discussed in more detail below, focused on diverting the mentally ill away from the criminal justice system (Rivera, 2004). This funding was reauthorized and expanded by S. 1194 (2003), the Mentally Ill Offender Treatment and Crime Reduction Act of 2004, which provided further funding for local collaborations between police, mental health, and substance use treatment—as well as between state and local governments—for the purpose of diverting those with mental illness away from the corrections system. In effect, the federal approach to addressing the problem of mentally ill persons in the criminal justice system has

been to encourage local agencies to develop their own approach. While it may contribute to the high present levels of mentally ill contacts, this may be appropriate as research has indicated the most effective programs are built on context-specific responses, motivated by recognition of a local problem, and involving the collaboration of local agencies (Reuland et al., 2009; Ritter, Teller, Munetz, & Bonfine, 2010). Broad policies produced by the federal government might be inefficient and less effective due to great differences in resources and mental illness challenges between communities.

Local Policy Developments

Mentally ill persons present a significant and well-known problem in many communities in the U.S., and consequently local criminal justice agencies throughout the nation have expanded efforts, particularly in the last two decades, to address this issue (Reuland et al., 2009). The primary policy reactions to local mental illness challenges have been the establishment of 1) specialized police responses, particularly Crisis Intervention Team (CIT) training, and 2) mental health courts, both of which are based on interagency collaborations between police, mental health, and substance use services and focus on diversion and connecting the mentally ill with social services. The present study focuses on the above, particularly CIT, as the available literature on alternative approaches has been mixed at best, indicating that use of any of these agencies alone, such as through increased mental health funding in isolation, may be ineffective at reducing criminal justice penetration of the mentally ill due to varying levels comorbidity of mental illness and substance use and associated homelessness and criminality (Lurigio, 2011; Markowitz, 2011; Reuland et al., 2009). Research, however, has indicated some traditional non-specialized approaches, that is police training on handling mental illness that does not incorporate collaboration with mental health treatment providers, can sometimes result in

improvements in mentally ill offender outcomes similar to collaborative approaches (Sellers, Sullivan, Veysey, & Shane, 2005). These traditional approaches were, however, compared to a variety of specialized approaches rather than only to the most successful and empirically tested approaches such as those discussed here.

CIT training

Implemented in hundreds of localities around the country, CIT training involves police officers engaging in approximately 40 hours of classes focused on crisis response tactics, particularly de-escalation, and improving understanding and recognition of mental illness, as well as the establishment of close relationships with mental health services to facilitate efficient transfers of custody (DeMatteo et al., 2013; Reuland et al., 2009). Empirical evidence for the effectiveness of CIT is substantial across a variety of metrics. Officers report increased ability to recognize, understand, and confidently respond to mental illness (Hanafi, Bahora, Demir, & Compton, 2008; Reuland et al., 2009; Ritter et al., 2010); as a consequence, informal resolutions of contacts with the mentally ill are reduced and both pre and post-arrest referrals to mental health services are increased (Broussard, McGriff, Demir Neubert, D'Orio, & Compton, 2010; Watson, 2010; Watson et al., 2010b). Overall rates of arrest of mentally ill persons have been found to be reduced (and declining further over time) or stabilized depending on the jurisdiction studied (Franz & Borum, 2011; Watson et al., 2010b). No systematic differences have been identified between those arrested or diverted before and after CIT training, indicating police are not widening the net—arresting larger numbers of less severely mentally ill persons—or narrowing their scope and only diverting the most seriously ill (Broussard et al., 2010). CIT has, consequently, increased the number of mentally ill persons contacting mental health and substance use services, producing lower rates of both incarceration and re-offending (Reuland et

al., 2009). Lastly, CIT has been found to be effective at reducing the use of force (including lethal force) in police contacts with the mentally ill, resulting in improvements in the safety of both officers and suspects (Parent, 2011; Watson, 2010); given the elevated risks of violent encounters between law enforcement and the mentally ill, which may have numerous severe consequences for both police and suspects, this is a particularly valuable policy outcome. Additionally CIT has been associated with more positive perceptions of the police by mentally ill persons contacted by CIT-trained officers (Watson, Angell, Vidalon, & Davis, 2010a).

On the other hand, studies have found that there may be limitations to the effectiveness of CIT in certain contexts and across particular measures. First, inter-institutional cooperation is a requisite for the successful use of CIT, and programs have been found to be less effective where the mentally ill are not considered by police to be a significant problem in the community (Ritter et al., 2010) or where mental health services are uncooperative with officers dropping off arrestees (Lord et al., 2011); there is evidence that fast "no-refusal" drop-off points at mental health services are critical for the effectiveness of CIT, in particular because they reduce the time officers in small jurisdictions, where there are few on duty at any time, spend idle during the intake process (Lord et al., 2011). CIT, as well as other programs, is most effective when there are regular meetings between different agencies or a designated position is established to facilitate interagency cooperation (Hartford et al., 2006; Lamb et al., 2004); collaborative approaches to mental illness in the community require significant information and resource sharing as well as open and constant communication between agency administration and practitioners. Due to the reliance on local mental health services, CIT also produces a degree of cost-shifting, with savings in the criminal justice system balanced out in part by increased costs for mental health and substance use agencies (Reuland et al., 2009). CIT has also been

criticized for possibly being more effective at reducing costs to the criminal justice system than ameliorating the symptoms of mental illness in individuals in the long run (Markowitz, 2011), and there are some indications that the effectiveness of CIT may decline over time, possibly representing a need for periodic retraining of officers (DeMatteo et al., 2013).

Mental health courts

Mental health courts are another approach to addressing local issues with mentally ill offenders. Unlike CIT, which is focused on diversion at time of initial contact, mental health courts engage offenders who have already been arrested and identified by mental health workers as suffering from a defined illness related to their crime; these arrestees participate voluntarily to avoid criminal court. Based on the model of drug courts that emerged in the 1980s, mental health courts divert mentally ill persons to appropriate voluntary treatment as a condition of avoiding formal criminal penalties. Similarly to CIT, empirical evidence for mental health courts has been positive on a variety of points. Mental health courts have been found to be effective in reducing incarceration, reoffending, and criminalization of mentally ill persons and increasing their contact with social services (DeMatteo et al., 2013; Honberg & Gruttadaro, 2005; Lamb et al., 2004; Sims, 2009). These courts also present one particular advantage over police programs like CIT, in that identification and response to mental illness is determined by a trained mental health professional rather than an officer of the law (DeMatteo et al., 2013), though an alternative CIT-like police-focused solution, co-respondent teams, utilizes mental health professionals in the field alongside police to address identification issues (Young, Fuller, & Riley, 2008). Similar to other approaches, mental health courts have been found to require effective collaboration with local mental health services and are compromised when they fail to account for substance use, homelessness, and mental illness together (Hartford et al., 2007).

While generally effective in improving outcomes for the mentally ill such as reducing recidivism and reoffending, by responding only to those criminally charged, mental health courts fail directly to address the local concern of high rates of police contacts with, and thus arrests of, the mentally ill and also do not divert individuals from the criminal justice system until they have penetrated relatively deeply, potentially further marginalizing the mentally ill (DeMatteo et al., 2013; Sims, 2009). Additionally, there are mixed responses in the literature to the paternalistic approach of mental health courts to mentally ill offenders. For instance, they resemble the juvenile justice approach in that mental health courts are focused on collaboratively arriving at an arrangement of services and restrictions that will result in the best long term outcome for the offender, but this presents the problem of conflicting interests of the mentally ill offender's representative, usually a public defender, who is working in cooperation with the judge and prosecutor (DeMatteo et al., 2013); in the scheme of the mental health court, the mentally ill subject is ceding some degree of their rights (Sims, 2009). A paternalistic approach also raises political concerns with regard to diminishing the responsibility of offenders and "juvenilizing" the mentally ill that may be contentious to both crime victims and advocates of the mentally ill (Sims, 2009).

Summary

The presence of the mentally ill in the criminal justice system is a multifaceted problem with a wide range of causes and, consequently, means of addressing the problem. The most important finding in the literature is that this problem cannot be addressed with either a universal approach for all communities or one that fails to coordinate the diverse groups that mentally ill persons come in contact with through the cyclical institutional shuffle caused by the intersection of mental illness, substance use, homelessness, and criminality (Berstein & Seltzer,

2004; DeMatteo et al., 2013; Lurigio, 2011; Reuland et al., 2009). The approach to addressing mental illness in communities must be chosen with regard to the existing resources, institutional constraints, and scope of the problem. CIT-based approaches, for instance, effectively reduce the number of mentally ill persons entering the criminal justice system, but leave the police as the primary responder to mental health emergencies and may present challenges to the limited budgets of local mental health services. Mental health courts effectively direct individuals into treatment and reduce offending, but may contribute to criminalization and raise concerns about due process; they may also not substantially reduce costs of policing. For some communities, neither approach may be ideal in the context of their mental health challenges. In any context, an empirically-supported collaboration effort between police, mental health providers, and substance use treatment services offers the best chance at successfully addressing the unique challenges of mental illness and crime in the community.

Local Context

Benton County serves as the focus of the present study, and with regard to the literature, it represents a typical picture of the mental health challenges facing communities throughout the country. Contacts with and arrests of the mentally ill are a growing concern for the primary law enforcement organizations in the area which are not properly trained or funded to handle the growing issue, and local law enforcement representatives do not believe the justice system is an optimal route for handling mentally ill suspects. Officials have reported that the county jail is underfunded and overcrowded with a disproportionate number of mentally ill suspects in custody, and Benton County currently is forced to rent extra jail space from neighboring counties to accommodate their inmates due to insufficient facilities (D. Simpson, personal communication, January 22nd, 2013). Likewise, the resources for mental health

treatment in the area are extremely limited, with only 24 psychiatric beds at Samaritan Hospital serving the entire county's need for emergency mental health treatment; the hospital emergency room serves as the primary police drop-off point for the severely mentally ill. Additionally, Benton County Mental Health (BCMh) is not well coordinated with local law enforcement and only offers outpatient services; BCMh, furthermore, prioritizes the voluntary treatment of the severely mentally ill, while police are primarily concerned with untreated and publicly disruptive individuals that may either be uncooperative with mental health services or suffer from illnesses not eligible for commitment (BCMh, personal communication, January 22nd, 2013).

Demographically, Benton County has a higher level of poverty, lower median income, and suffered more employment loss in the recent economic crisis than most counties in Oregon (U.S. Census Bureau, 2013). Benton County may also be at a disproportionately high risk for both homelessness and housing insecurity due to rapidly rising rental prices caused by a variety of local and national factors (Willamette Neighborhood Housing Services, 2012). Lastly, representatives from BCMh and local law enforcement have expressed that the recent rise in mental health contacts may be in some way related to the closing of the Oregon State Hospital in Salem pending construction of new facilities in Salem and Junction City (personal communication, January 22nd, 2013).

On the other hand, Benton County may be better positioned than most communities to address growing concerns with mental illness. Funding for law enforcement and mental health services remained relatively stable or grew through the recent recession and the county economy is recovering across a variety of metrics, particularly unemployment (Oregon Employment Department, 2013). The county also benefits from the presence of Oregon State University, which produces high average levels of education and additional resources for analyzing and

responding to the mental health crisis. Recent changes in the state structure of healthcare, toward a Coordinated Care Organization (CCO) model—under which regional medical, mental health, and substance use treatment providers share information and clients to increase efficiency and coverage—have also resulted in a significant increase in the proposed budget for mental health treatment in the next biennial period; new organizational goals for BCMH in 2013-2015 include expanding outpatient addiction services and integrating them with primary care and mental health services and establishing a local mental health promotion initiative (Benton County, 2013). The increased interagency cooperation presented by the CCO model may also yield improved mental health benefits through better coordination of services, a key goal of most policy responses described in the literature. The county has also successfully utilized a drug treatment court, though the proposed budget reports the court is being transferred from operation by BCMH to a private-run system overseen by law enforcement (Benton County, 2013). The future impact of this change is currently uncertain, but it will free funds for enhanced mental health programs in other areas by shifting operational costs to other agencies. Lastly, if the recent increase is connected to the dismantling of state facilities in Salem, it may be temporary as the new facilities in Junction City and Salem are scheduled to open in the near term. Overall, while there are numerous challenges to an effective solution for mental health cases in the area, there are also many reasons to be hopeful that a feasible policy response can be produced that accounts for the institutional context of Benton County.

Methods and Results

This section presents the empirical approach to analyzing the local context of Benton County's mental illness crisis from the perspective of police encounters. Police arrest data was converted into various forms to analyze different relationships between individual and aggregate

predictors of mental illness and arrests and a variety of outcome variables such as total monthly arrests or counts of POCs. Methods and results are presented together and divided by type of analysis: longitudinal by year, longitudinal by month, cross-sectional by arrest, and cross-sectional by suspect. A variety of theoretical relationships are validated, particularly at the individual and arrest levels, and the overall rising trend in POCs is found to be correlated with a sudden increase in "repeat players" in 2012, though the cause of growth in this population remains unknown.

Data

The primary data set used for these analyses is a complete account of all charges associated with any arrest conducted by BCSO or CPD between January 1st, 2007 and December 31st, 2012. This omits arrests performed by the Philomath Police Department or Oregon State Police (OSP), particularly on the Oregon State University campus where OSP have sole jurisdiction. Both suspects and arresting officers were identified with random numbers to preserve anonymity. The original data describe 34,629 charges. After removing 182 charges with invalid anonymous suspect IDs and 1383 duplicate or expunged entries and observations with data entry errors (4.5% of all observed charges but only 14 suspect IDs, approximately .1%, were omitted), the data encompass 33,064 individual charges associated with 22,875 arrests of 13,650 individual suspects. These data include agency-reported arrestee sex, age, race (as white, black, Asian, American Indian, or unknown; notably Hispanic is not a recorded category), date and time, arresting agency (BCSO or CPD), and statute associated with the charge. For longitudinal analyses, the following additional yearly county-level data were integrated for use as statistical controls: number of unemployment insurance payments from the Oregon

Employment Department (2013) and one-day total homeless shelter population counts from Oregon Housing and Community Services (2012).

Descriptive Statistics

The charge data were collapsed into the following data sets differing by unit of analysis to look at different relationships, trends, and conditions: 1) Yearly aggregate statistics of arrests including those with a Peace Officer Custody and/or substance possession as well as all total arrests; this permits the use of yearly demographic and economic controls. 2) Monthly aggregate statistic where arrest trends can be seen in greater detail than with yearly data, though no relevant county-level controls were available at the month unit of analysis. 3) Arrest events for cross-sectional analysis obtained by combining all charges in a particular event into one observation. 4) Arrested individuals from collapsing the first cross-sectional set into anonymous arrestee ID, creating a count summary of the number of arrests for each suspect, both by particular classes of statute—particularly those including a peace officer custody or drug possession charge—and all arrests combined. 5) A subsample of the previous data set consisting only of arrested individuals with two or more POC charges.

Table 1. Descriptive Statistics for Arrests in Benton County by Year, 2007-2012

Variable	Mean	SD	Min	Max
Non-POC Arrest	3662.333	215.772	3423	4040
POC	152.500	46.458	124	246
BCSO POC	17.667	7.866	10	32
CPD POC	134.833	39.158	110	214
UI Payments	59793.000	30046.490	23237	94352
Homeless Count	138.200	19.652	107	154
Single POC	115.167	19.974	95	151
2+ POC	37.167	28.181	18	94
N = 6				

Table 1 depicts descriptive statistics of yearly arrest data for Benton County for the years 2007 through 2012. POC is a count of arrests with an associated POC charge and Non-POC arrest is a count of all remaining arrests. The BCSO and CPD variables for POCs and any arrests are by-department disaggregations of these arrest types. It is noteworthy that the minimum value of CPD Any is not an integer; this is caused by a small number of arrests having co-occurring charges from both CPD and BCSO, likely due to interagency collaboration during incidents. The counts of arrests are divided between the departments proportionally based on the number of charges from each. The remaining two variables are used as county-level predictors of mental illness. UI Payments is a count of total unemployment insurance payments made to residents of Benton County in a given year as provided by the Oregon Employment Department; this variable is presented to capture some of the economic changes that may impact area rates of mental illness. Homeless Count is a one-day count of the population of area homeless shelters in a given year provided by Oregon Housing and Community Services, which, while a rough measure of the area homeless population, is the best available metric for quantifying this hard-to-reach population. Single POC is a count of POC arrests of suspects who were not arrested for another POC in a given year. Lastly, 2+ POC is a count of the POC arrests of individuals with more than one POC in a given year; this is, in effect, a measure of the repeat-player contribution to POC arrests in a year.

Table 2. Descriptive Statistics for Arrests in Benton County by Month, 2007-2012

Variable	Mean	SD	Min	Max
Any Arrest	317.875	43.500	225	430
Non-POC Arrest	305.167	43.053	214	415
POC	12.708	4.854	3	30
Drug Possessions	29.903	9.222	10	53
BCSO POC	1.472	1.300	0	4
CPD POC	11.236	4.258	3	26
BCSO Any	99.238	20.949	49	147
CPD Any	218.637	44.229	138.167	364
N = 72				

Table 2 depicts descriptive statistics of monthly arrest data for Benton County for the years 2007 through 2012. Any Arrest is a count variable indicating the total aggregate arrests occurring in a month. Non-POC Arrest is a count variable constructed by subtracting POC, a count of total arrests with at least one POC charge occurring per month, from total arrests. Drug Possessions is a count variable of the number of arrests including at least one illicit substance possession charge. The remaining four variables depict the total number of all arrests and POCs by department for each month, where, as in the monthly data, we find some non-integer counts due to arrests conducted by both departments simultaneously. It should also be noted that CPD conducts substantially more POC arrests than BCSO as a proportion of total arrests; 1.5% of BCSO's arrests involve a POC compared to 5.1% for CPD. The cause of this disparity is unknown, but possibly due to jurisdictional or policy differences. Additionally, not shown in the table, a number of dummy variables corresponding with major mental-illness associated violent events were produced to account for possible availability effects caused by media coverage that might impact police likelihood to perform POCs or classify arrests as such; these are detailed in Appendix 1.

Table 3. Descriptive Statistics for Arrests in Benton County, 2007-2012

Variable	Mean	SD	Min	Max
BCSO	.312	.463	0	1
Age	29.915	12.841	10	90
Male	.769	.422	0	1
White	.894	.308	0	1
Black	.035	.184	0	1
Am. Indian	.008	.089	0	1
Unknown Race	.046	.210	0	1
Any Charge	1.445	1.024	1	23
POC	.040	.197	0	2
Morning	.129	.335	0	1
Afternoon	.224	.417	0	1
Evening	.271	.445	0	1
Late Night	.376	.484	0	1
N = 22,875				

Table 3 depicts descriptive statistics of the cross-sectional data set of all individual arrests in Benton County for the years 2007 through 2012. The variable BCSO is a dummy variable indicating the arrest was conducted by a Benton County sheriff; approximately a third of all arrests in the data set were conducted by BCSO. Age is a discrete variable indicating the age of the suspect at time of arrest; observations with age below 10 or over 90 were dropped as most appeared to be data entry errors. Male is a dummy variable indicating officer-reported gender of suspects; approximately three quarters of arrests involved male suspects and, after collapsing arrests, no values between 0 and 1, indicating mixed identification of sex, were found. White, Black, American Indian, and Unknown Race are dummy variables representing respondent-determined race of suspects; as with sex, no intermediate values were found. Any charge is a count variable indicating the sum of all individual charges in any given arrest event. POC is a count variable indicating the sum of all POC charges in any given arrest event; POCs occur in approximately 4% of all arrests and a very small number of arrests had two POCs due to both BCSO and CPD responding to the incident and recording a POC charge. Morning is a dummy

variable indicating a given arrest occurred between 6 AM and noon. Afternoon indicates an arrest occurred between noon and 6 PM. Evening encompasses 6 PM to midnight and Late Night includes midnight to 6 AM. It is worth noting that more than a third of all arrests in the data occurred in the Late Night period while Morning is substantially underrepresented.

Table 4. Descriptive Statistics for Arrested Suspects in Benton County, 2007-2012

Variable	Mean	SD	Min	Max
BCSO	.324	.446	0	1
Age	28.233	12.474	10	90
Male	.743	.437	0	1
White	.889	.311	0	1
Black	.029	.167	0	1
Am. Indian	.005	.073	0	1
Unknown Race	.056	.226	0	1
Any Arrest	1.676	2.335	1	88
POC	.067	.369	0	14
Drug Possession	.175	.515	0	8
2+ POC	.009	.093	0	1

N = 13,650

Table 4 depicts descriptive statistics for the cross section of 13,650 suspects arrested in Benton County in the years 2007 through 2012. As before BCSO is a dummy identifying arresting agency, in this case due to summation it has been transformed into a number indicating the proportion of suspect arrests conducted by CPD (0) or BCSO (1). Age now indicates age at time of first arrest. The racial dummies are now proportions indicating the proportion of arrests in which an individual has been identified as a given racial group. Any Arrest is a count variable indicating the number of times a suspect has been arrested, regardless of the number of individual charges per arrest. POC is similarly a count variable indicating the number of arrests a suspect has experienced that include at least on POC charge. Drug Possession is also a count variable of the number of arrests of the suspect that include at least one drug possession charge. 2+ POC is a dummy variable indicating an individual has at least two separate arrests in which a

POC was a charge and is a proxy indicator for “repeat player” suspects who may potentially have chronic unmet mental health needs.

Table 5. Descriptive Statistics for Suspects with 2+ POC Arrests, 2007-2012

Variable	Mean	SD	Min	Max
BCSO	.157	.324	0	1
Age	33.791	15.702	10	90
Male	.534	.499	0	1
White	.877	.325	0	1
Black	.030	.170	0	1
Am. Indian	.007	.084	0	1
Unknown Race	.055	.220	0	1
Non-POC Arrest	1.182	3.028	0	23
POC	1.311	1.020	1	14
Drug Possession	.079	.345	0	4
2+ POC	.168	.374	0	1
N = 697				

Table 5 depicts descriptive statistics for the 697 suspects with at least two POC arrests in the six year span of the data; for the purposes of this work, this population is defined as "repeat players" as they are expected to consume a disproportionate quantity of police resources.

Variable definitions for this population are identical to Table 4, except Any Arrest has been replace with Non-POC arrest, which is a count of all arrests which did not include a POC charge. While largely similar to the general sample of arrestees, in comparison to Table 4, we see the 2+ POC population is somewhat older and less male, and less likely to be arrested for drug possession, though it is important to note that this is compared to a sample of arrestees rather than the general population; "repeat players" may still be more likely to have drug possession arrests than those in the general population.

Yearly Analysis

Due to the narrow span of time covered by the data set, yearly analyses suffer from insufficient observations to utilize sophisticated models with a wide variety of aggregate

predictors of mental illness. Consequently, a variety of simple models were conducted with unemployment insurance payments, homeless counts, total arrests, drug arrests, and population as predictors, but no statistically significant relationships were found and the results were substantively uninteresting and thus have been excluded. Bivariate trend graphs, however, appear to confirm no clear connection between area POC arrest counts and primary community-level predictors of mental illness found in the literature such as unemployment and homelessness. Additionally, they indicate the presence of what may be an unusual anomaly in POC trends between police departments in Benton County. These are presented and discussed below.

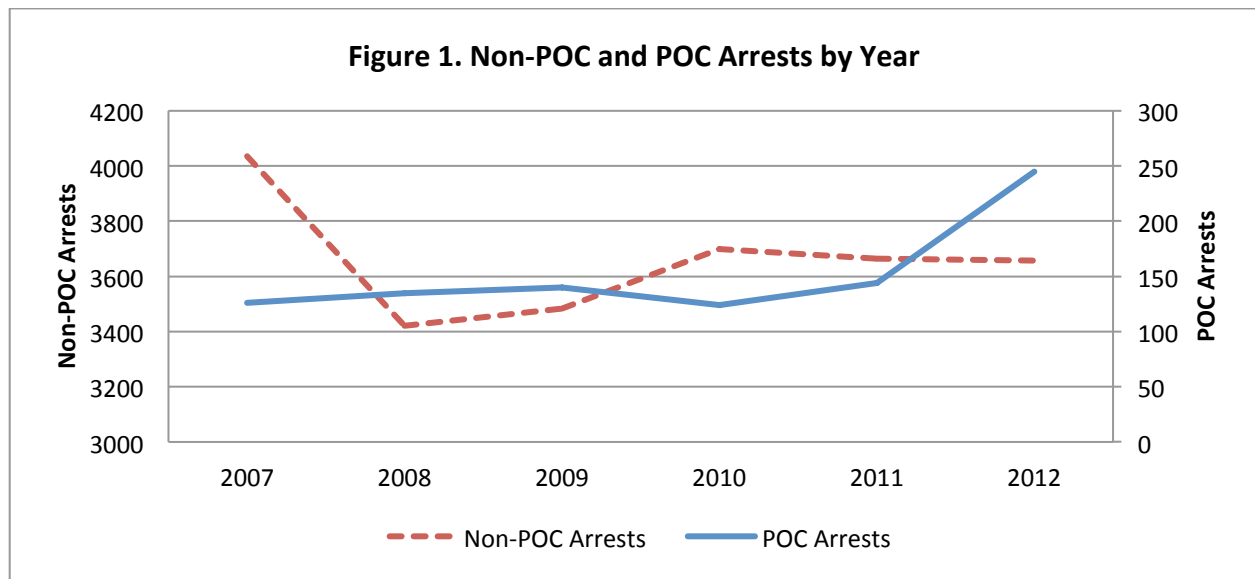


Figure 1 depicts sums of both non-POC and POC arrests for both CPD and BCSO combined by year. This paints a rather jarring picture; POC arrests in Benton County were extremely consistent from 2007 to 2011, then in 2012 abruptly increased to nearly twice the mean level of the preceding five years while non-POC arrests declined initially then remained relatively constant through the period. This illustrates the lack of correlation between POC arrests and non-POC arrests in the area; while total counts of all arrests have varied more by year

than POC counts, the recent trend has been very consistent. It is clear POC arrests cannot be explained by changes in general arrest or crime patterns in Benton County.

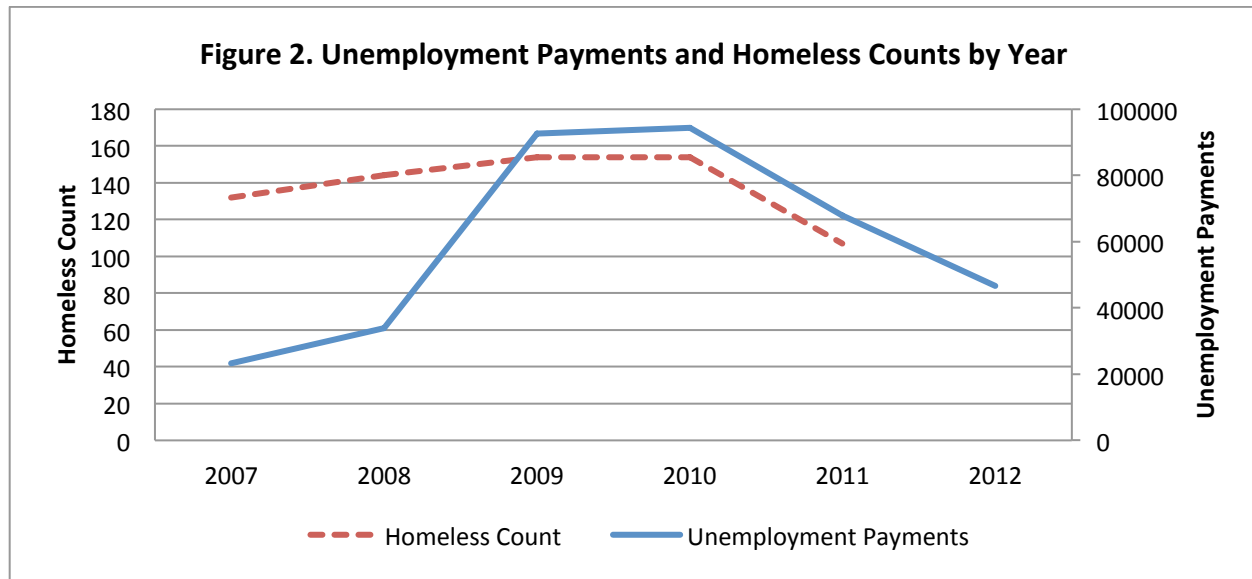


Figure 2 depicts cumulative counts of monthly unemployment insurance payouts to Benton County residents by year and homeless counts by year. Unemployment payments serve as a proxy measurement for rates of unemployment in the community that should better capture both number of unemployed and duration of unemployment than fixed yearly percentages. Homelessness figures were obtained from one day homeless counts by year for homeless shelters in Benton County, though data on 2012 were not available at time of publication. It can be seen that unemployment rose sharply following the 2008 financial crisis, but began recovering substantially by 2011 and appears to be continuing to improve, though it is unclear to what degree this is due to attrition of individuals exhausting available unemployment benefits rather than entering the workforce. Similarly, homeless counts increased somewhat in this period but appear to have fallen substantially, though it is unclear how robust a measurement of homeless this measure is given difficulties in accessing the population. In both cases, the trends seem to be

negative in the recent period; neither of these provides a potential explanation for the sudden increase in POC arrests in Benton County in 2012.

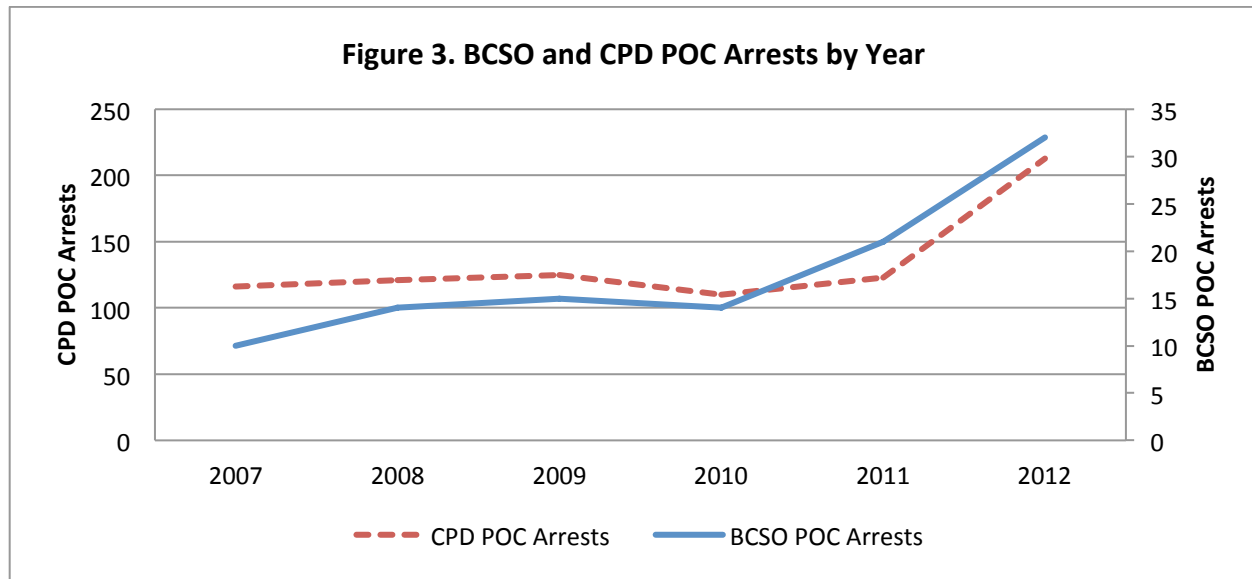


Figure 3 depicts total yearly counts of POC arrests conducted by BCSO and CPD. This graph illustrates an interesting relationship in the POC counts between departments. While both departments produced relatively consistent numbers of POC arrests from 2007 to 2010, we see a fairly strong divergence first at 2011, rather than at 2012 where the major increase was detected in Figure 1 and earlier models. It appears there was a substantial increase in POC arrests for BCSO in 2011 followed by a similar magnitude increase in 2012; this appears to be closer to a trend than an abrupt increase as indicated by the combined data. The increases in both 2011 and 2012 were found to be statistically significant at the 90% and 99.9% level respectively in simple bivariate regressions. In contrast, CPD shows no increase at all in POC arrests in 2011; counts by year for CPD are exceptionally uniform from 2007 to 2011. Then in 2012, CPD POC counts suddenly rose by a proportion similar to the cumulative rise experienced by BCSO in 2011 and 2012; the CPD increase from the 2007-2011 mean of 119 to the 2012 value of 213 is a factor of 1.79, while for BCSO the 2007-2010 mean was 13.25 resulting in a factor increase of 2.415 if we

combine the 2011 and 2012 increases. An explanation for the difference in the year of the apparent beginning of the rise in POC arrests between departments is unclear, but a hypothesis in the form of unintentional policy change is presented below in the discussion of the findings.

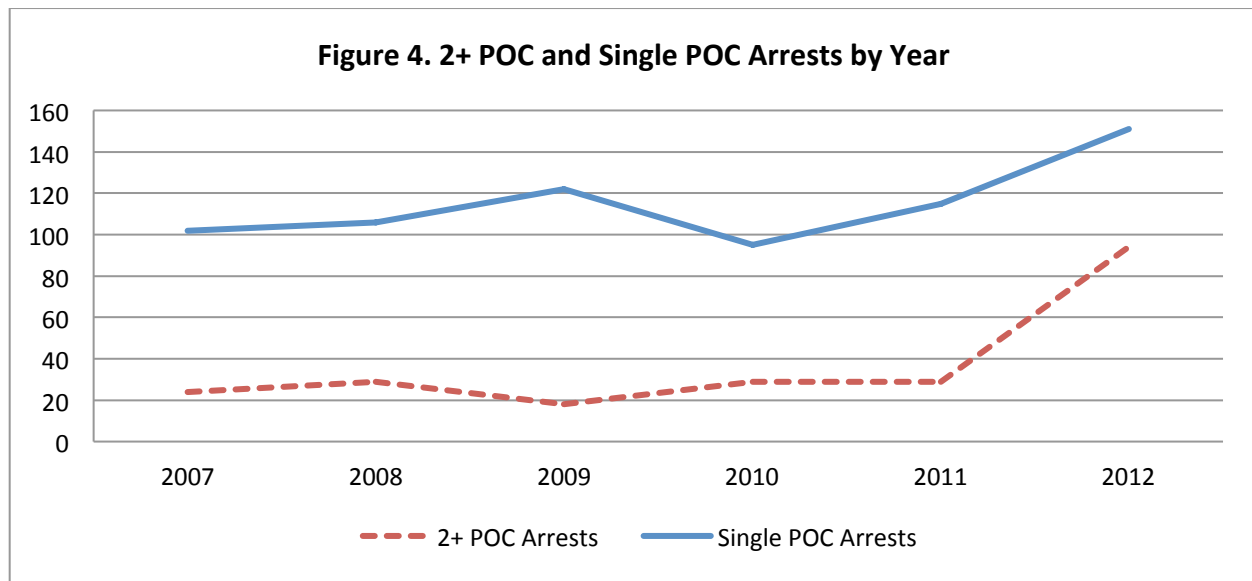


Figure 4 depicts the count of Single POC arrests by year, that is POC arrests of individuals who were not the subject of a second POC arrest in a given year, contrasted with yearly POC arrest counts of individuals with multiple POC arrests in that year. This provides a relatively crude comparison of “repeat players”, which may have chronic untreated mental illnesses and consume more police resources, with individuals that suffer from isolated mental health incidents requiring police responses. The graph indicates that increased 2+ POC arrests, arrests of “repeat players”, seem to be the chief driver of the increase in total POC arrests seen in the preceding graphs; levels of 2+ POC arrests were quite stable for the first five years of data, then more than tripled in 2012. It is noteworthy that there is some evidence that the “repeat players” in 2012 are, to a large degree, different individuals than those responsible for POCs in prior years as only 59 of the 669 POC arrests occurring in the prior five years involved a suspect

arrested for any, not just 2+, POC in 2012. The number of individual repeat players also appears to have grown substantially in 2012 and this is depicted in Appendix 2. It is important to note that this measure of “repeat player” arrests is limited as it will fail to capture individuals whose POC arrests are spread across multiple years, though those individuals may also be less demanding on criminal justice resources than those being arrested from POCs with sufficient frequency to manifest in these figures.

Monthly Analysis

Longitudinal analysis by month was conducted using OLS with Newey-West heteroskedasticity and autocorrelation robust standard errors for predicting total counts of POCs by month; this error estimator is the most conservative available in the presence of error structure violations of OLS assumptions in time series models. Models were replicated with negative binomial regression to check robustness against potential OLS bias caused by count variable behavior; results were substantively identical and can be seen in Appendix 3. A graph of POC counts by month may also be found in Appendix 4. Significant Dickey-Fuller unit root tests indicate all variables used in monthly models conform to assumptions of stationarity in longitudinal modeling. Low variance inflation factors indicate the absence of severe multicollinearity between independent variables. Models were analyzed with Breusch-Godfrey tests with one to twelve lags and all but Model 1 were found to have no evidence of autocorrelation and Breusch-Pagan tests similarly detected heteroskedasticity only in Model 1; regardless, any potential impact of either autocorrelation or heteroskedasticity in any model was mitigated through use of Newey-West standard errors. R^2 and Adjusted R^2 are provided as measures of relative fit of the models.

Table 6 depicts Newey-West OLS regressions of POC arrests by month. Model 1 shows the relationship of counts of non-POC arrests and drug possessions with the number of POC arrests in a given month. Model 2 introduces a dummy variable that takes the value of 1 for any month falling in the year 2012; this dummy is accounting for the presence of a potential unobserved change in the area producing the sudden increase in POC arrests beginning in January of 2012¹. For the next two models, a variety of dummy variables were introduced to account for potential reactive policing effects following major mental-illness related violent incidents; this was done not based on theoretical justification but an exploration of the potential that POC arrest counts might be subject to change due to factors which are neither community-level changes nor explicit police policy changes. Model 3 accounts for this with dummies that take the value of 1 only for the month in which the given violent incident occurred. Model 4 introduces a lag to account for the possibility that changes in the frequency of police decisions to conduct POC arrests may occur both in the month of the event and in the following month. The Clackamas dummy variable's lag is omitted as the event occurred in December of 2012, the last observed month in the data set. The Clackamas, Sikh, and Aurora events occurred in 2012, so some degree of collinearity with the 2012 dummy may be impacting significance of their coefficients; removing the 2012 dummy introduces significant bias however due to these events soaking up residual variation. Model 5 depicts a dynamic time series model using a lagged dependent variable to account for potential path dependency in mental arrests; it is possible that being arrested for a POC in the prior period results in a higher likelihood of present POC arrest through the disruptive effects of criminal justice system involvement in the lives of the mentally

¹ Depending on the model, a trend of quadratic or cubic form was found to be statistically significant, but driven entirely by 2012 data points; introduction of the 2012 dummy variable rendered the trends completely nonsignificant, thus they were omitted from analysis. Similarly, yearly dummies were found to be no more predictive than the single 2012 dummy alone and produced lower overall adjusted R² statistics. Seasonal dummies were also tested and found to have no significant relationship with POCs.

ill. The converse may also be true, that higher POC arrests in a given month may result in incapacitation of the severely mentally ill, producing lower arrests in the following term.

Table 6. Newey-West OLS Regressions of Counts of POC Arrests by Month

	Model 1	Model 2	Model 3	Model 4	Model 5
Non-POC Arrests	-0.0012	0.0048	0.0017	-0.0004	-0.0049
Drug Possessions	0.0806	-0.0113	-0.0146	-0.0273	-0.0367
2012		9.3289***	8.9762***	9.2977***	7.1878***
L1.POC					0.2305***
Clackamas			5.8337***	5.6594***	5.4646***
Sikh			-3.3785*	-3.7517	-4.0669***
L1				-0.3610	
Aurora			-0.1554	0.2513	0.4037
L1				0.2510	
Carson			-2.3956***	-2.1802***	-3.5188***
L1				5.2734***	
Giffords			-2.2020***	-1.8873**	-2.5601***
L1				1.2129	
Ft. Hood			-2.2480***	-2.0605***	-2.6627***
L1				1.6742*	
Illinois			-6.3094***	-6.2914***	-7.7217***
L1				2.5202***	
Virginia Tech			2.4566***	2.7613**	2.9206***
L1				4.0995***	
Constant	10.6404***	10.0140***	11.2233***	12.0451***	8.4467***
N	72	72	72	71	71
R2	0.0229	0.5211	0.5835	0.6176	0.6117
Adj R2	-0.0054	0.5000	0.5072	0.4853	0.5314

* p<.05 ** p<.01 *** p<.001

In Model 1 we see no significant relationship between POCs and the count of all non-POC arrests or drug possession arrests. In Model 2, the 2012 year dummy is highly significant and positive. This is not indicative of any meaningful relationship, but signifies that trends in other arrest types fail to explain the variation seen in 2012; it is noteworthy that the 2012 dummy alone appears to explain approximately fifty percent of all variation seen in the data. Model 3's event dummies are nearly all statistically significant but their direction is erratic; if police POC arrest behavior was impacted by high profile violent mental illness events, we would expect

relatively uniform positive coefficients. The coefficient values and statistical significance of these dummies are likely due primarily to omitted variable bias. Once the lagged event dummies are introduced in Model 4, we appear to arrive at the expected results with regard to the potential impact of these high profile events; the coefficients on the lagged dummies of Carson, Ft. Hood, Illinois, and Virginia Tech are all positive and statistically significant. While far from conclusive, this model provides some small evidence of reactive effects in police behavior to high profile mental illness-related events; this may be indicative of police arrests being subject to unobservable non-local and non-policy factors, which may introduce measurement error when using POCs as a proxy for general mental health contacts by police. Lastly, Model 5 depicts results similar to Model 3 in magnitude and direction, and the lagged dependent variable is highly significant, indicating past month POC counts are a strong positive predictor of present month POC counts. Event dummy coefficients remain largely significant but mostly negative against expectation. Across all models with the 2012 dummy it remains positive and highly significant; no models successfully explain the massive increase in POC arrests seen in 2012.

Cross-Sectional Analysis of Arrests

Cross-sectional analyses of arrests were conducted using logistic regression for determining the predictors of a given arrest including one or more POC charges. Logistic regression was chosen because the dependent variable is a binary condition with a sufficiently high count of 1 values to be consistent and efficient and the total number of observations is more than adequate for optimal model performance. All logistic regressions were conducted with robust standard errors to compensate for any improper model specification and no significant multicollinearity was detected between predictor variables as indicated by VIFs, obtained using

analogous linear probability models, uniformly under two. AIC, BIC, and McFadden's Pseudo-R2 are provided as measures of relative model fit. Output is displayed in odds ratios.

Table 7 depicts logistic regression results as odds ratio relationships of predictors to the chance that an arrest will have a POC charge. Model 1 is a simple bivariate model using only a count of all charges in a given arrest as a predictor. Model 2 adds basic demographic predictors of gender and age and an indicator for what agency (or proportional combination of agencies as described above) was responsible for the arrest with BCSO taking a value of 1. Model 3 adds dummies for officer-reported race with white as the baseline and Hispanic not a reported category (Hispanic individuals would be found throughout the other categories, most likely in White and Unknown Race). The final model adds three time of day dummies to account for the possibility that the likelihood of making a POC arrest is time dependent; morning (6 AM to noon) is the reference category.

Table 7. Logistic Regression of POC Charges by Arrest

	Model 1	Model 2	Model 3	Model 4
Count of Charges	0.360***	0.386***	0.385***	0.387***
Male		0.295***	0.292***	0.299***
Age		1.029***	1.030***	1.028***
BCSO		0.253***	0.254***	0.255***
Unknown Race			1.206	1.221
American Indian			0.624	0.609
Black			1.556*	1.573**
Asian			1.945***	1.988***
Afternoon				1.068
Evening				1.390**
Late Night				0.815
N	22,875	22,875	22,875	22,875
Pseudo-R2	0.028	0.107	0.110	0.115
AIC	7465.689	6862.447	6853.706	6822.312
BIC	7481.765	6902.636	6926.046	6918.766

* p<.05 ** p<.01 *** p<.001

In Model 1 we see a significant negative relationship between counts of any charges and the likelihood of an arrest being a POC arrest; this indicates that POC charges are less likely to occur in conjunction with larger numbers of arrests, or, rather, that POC charges are not typically being "bundled" with many other charges. A simple tabulation of POC and non-POC charges indicates the vast majority (94%) of POC charges occurred without any additional non-POC charges. All three variables introduced in Model 2 are highly statistically significant. The odds ratio on Male indicates that male suspects are less than a third as likely to receive a POC charge as women in a given arrest. This is not due to women being more predisposed to mental health arrests, but rather due to men being proportionally more likely to commit non-POC crimes; the arrest data contain a very even split of POCs by sex with 444 (48.6%) female and 470 (51.4%) males represented as compared to 4851 (22.1%) non-POC arrests of females and 17,110 (77.9%) non-POC arrests of males. Age appears to be positively related to POC arrests and, interestingly, unlike in many other models of crime phenomena, age was not found to have a nonlinear functional form; age appears to have a relatively linear relationship to the likelihood of an arrest being a POC. This is likely indicative of a variety of possible factors including mental illness increasing in severity with age, protective arrests being more likely to occur with older suspects, and, importantly, older suspects being less likely to commit offenses associated with non-POC arrests due to aging out. BCSO has a notable negative relationship with POCs, indicating that the agency is approximately a quarter as likely to conduct a POC arrest as CPD. This is likely due primarily to jurisdictional differences, but may bear additional examination in the future. Model 3's racial dummies yield significant coefficients only for Black and Asian which are both substantially positive compared to the White reference category. An explanation for the racial differences in POC arrests is uncertain, but may be due to underrepresentation in non-POC

arrests accompanied by rates of mental illness similar to the white population, though this may be uncertain due to combination of Hispanic individuals with other racial groups. The final model shows a significant relationship only for the Evening dummy, indicating POC arrests are approximately 40% more likely to occur in the evening as compared to morning; auxiliary testing indicates Evening is statistically significantly higher than both Afternoon and Late Night as well. This is an interesting finding as the majority of arrests occur in the period covered by Late Night. Although the reason for this is uncertain, this relationship may be indicative of higher levels of calls for service by residents between 6 PM and midnight due to mental-illness related public disturbance that may go unseen and unheard at other times. Alternatively, there may be a relationship between displays of mental illness symptoms and time of day.

Cross-Sectional Analyses by Suspect

Cross-sectional analyses by suspect were conducted using logistic regression for likelihood of having different numbers of POC arrests, drug possession, and any non-POC arrests for those with a POC. Logistic regression was chosen for the binary indicator variables for reasons described in the previous section on models of likelihood of arrests having a POC charge. All cross-sectional analyses by suspect were conducted with robust standard errors to correct for potential incorrect model specification. No notable levels of multicollinearity were detected. AIC and BIC statistics for intermodel comparison were excluded due to different dependent variables in use.

Table 8 depicts odds ratios from logistic regressions of likelihoods of the following different numbers of POC arrests by suspect: any POC arrest, two or more POC arrests, and three or more POC arrests. These models attempt to analyze if there are different predictive factors for

all suspects arrested for POCs as compared to "repeat players" which the literature notes may be systematically different from the population of all mentally ill individuals and are responsible for disproportionate use of police resources. The models include count of non-POC arrests and a binary indicator of any drug possession arrests as primary independent variables. Additionally, age and the racial category dummies were included for demographic controls; age was found to have a significant nonlinear relationship of cubic functional form in the first model and quadratic in the second and third. In the third model, American Indian was excluded due to perfectly predicting failure; no American Indians were identified as having more than two POC arrests.

Table 8. Logistic Regression of Likelihood of POC Arrests by Suspect

	Any POC Arrest	2+ POC Arrests	3+ POC Arrests
Non-POC Arrests	.838	1.029	1.052**
Any Drug Possession	.583***	.853	.797
BCSO	.288***	.171***	.092***
Age	1.180***	1.228***	1.349**
Age ²	.997*	.998**	.996**
Age ³	1.000*		
Male	.391***	.347***	.276***
Black	1.169	1.615	3.716*
Asian	1.472	1.619	2.393
American Indian	1.184	1.050	
Unknown Race	.986	.820	.126
N	13,650	13,650	13,573
Pseudo-R2	.090	.098	.116

* p<.05 ** p<.01 *** p<.001

Model 1 indicates no significant relationship between the count of non-POC arrests and having any POC arrest, however this becomes significant and positive for 3+ POC arrests, indicating a relationship between "repeat player" status and higher numbers of non-POC arrest; this may be indicative of higher consumption of police resources by this population. Any drug possession arrest was found to have a significant negative relationship with the likelihood of

having a POC arrest, but this is likely substantively uninformative as while substance use is often undertaken by the mentally ill to self-medicate, substance users aren't necessarily highly more likely to develop serious mental illness. Proportion of arrests by BCSO appears to produce a significantly negative impact on likelihood of having a POC arrest which declines as the threshold of number of POC arrests increases; BCSO appears to arrest fewer "repeat players" for POCs proportionally than CPD. Age is universally a statistically significant and generally positive, but nonlinear, predictor of all thresholds of POC arrests. Male, as in earlier models, is a strongly negative and significant predictor of having POC arrests, but this is, as before, likely due to overrepresentation of men in other types of arrests. Interestingly, for the category of 3+ POC arrests, the Black racial dummy was found to be highly positive and statistically significant at 95%. Given the small number of individuals with three or more POC arrests (41), this may simply be the impact of outliers; there are only four Black individuals with three or more POC arrests in the sample.

Table 9 depicts odds ratios from logistic regressions of the likelihood of a suspect having any drug arrests. This model attempts to capture the impact of severe mental illness on drug use through POC arrests as a proxy. The first model uses counts of all POC arrests as the primary independent variable and the second model divides suspects into groups by only one POC arrest or two or more POC arrests with those with no POC arrests as the reference category (no substantive difference was detected between 2+ POC arrests and higher thresholds). The second model was chosen to determine if there is a significant difference between "repeat players" and those with only a single mental incident with regard to drug possession arrests. Proportion of arrests conducted by BCSO, age, racial dummies, and the count of non-drug or POC arrests were included as controls. As before, no severe multicollinearity was detected and robust standard

errors were utilized. AIC and BIC stats for intermodel comparison were excluded due to high values; as noted after analysis of the results, these models are not strongly predictive.

Table 9. Logistic Regression of Likelihood of Any Drug Possession Arrest by Suspect

	Model 1	Model 2
POC Arrests	.697**	
1 POC Arrest		.442***
2+ POC Arrests		.867
BCSO	1.812***	1.804***
Age	1.044***	1.044***
Age ²	.999***	.999***
Male	1.251***	1.244***
Black	.847	.844
Asian	.490**	.491**
American Indian	1.610	1.615
Unknown Race	.547***	.548***
Non-Drug/POC Arrests	1.017	1.016
N	13,650	13,650
Pseudo-R2	.021	.023

* p<.05 ** p<.01 *** p<.001

Model 1 indicates a statistically significant negative relationship between counts of POC arrests and the probability of having a drug possession arrest. In Model 2, however, we see that this appears to be driven primarily by a strongly negative relationship between single POC arrests and drug possession, while those with two or more POC arrests are not significantly different from those without POC arrests with regard to drug possession charges. This is an interesting finding which highlights the heterogeneity that occurs within the population of arrestees; as discussed earlier, those with only single POC arrest are relatively unlikely to have any other arrests regardless of type, including drug possession. Those with single POCs are likely to be individuals who are not particularly disposed toward criminality, but rather suffered a single (or perhaps a few rare or infrequent) severe mental illness related episode requiring a police response. In both models the remaining variables are similarly predictive, with BCSO

being substantially more likely to be involved in drug possession arrests, age having a nonlinear relationship, males being mildly but significantly overrepresented, and Asian and unknown race individuals substantially less likely to be arrested for possession. Interestingly, and in line with substance abuse literature (Akins, Lanfear, Cline, & Mosher, 2013) the odds ratio for drug possession on American Indian is highly positive and approaches significance at the 90% level. In interpreting these models it is important to recognize that they are not particularly predictive, exhibiting very low pseudo-R² fit statistics; results may be biased significantly by any unobservables correlated with the included independent variables.

Table 10 depicts logistic regressions of the likelihood of having non-POC arrests for the subsample of individuals with at least one POC arrest; the first model uses total POC counts while the remaining three use dummies of various POC count thresholds with one POC as the reference category. This form of analysis was chosen because conducting a whole sample analysis of POC arrests as predictors of non-POC arrests is methodologically unsound due to truncated zeroes of non-POC arrests for those without a POC; all individuals without a POC necessarily have at least one non-POC arrest and this produces separation (dropped observations) in logistic regression. Additionally, use of separate dummies allows mapping of nonlinear effects of interest such as potential "repeat player" phenomena. Avoiding separation through modeling counts of the dependent variable using negative binomial regression produced convergence failures, most likely due to the truncation of zero values for the majority of the sample and subsequent collinearity issues; negative binomial models could not be calculated. A subsample analysis, while limited in generalizability, is a more robust approach. No serious multicollinearity was detected and robust standard errors were used to compensate for any potential improper specification. Pseudo-R², AIC, and BIC are provided for inter-model

comparison, though overall fit of all models is relatively poor and there are, again, concerns of omitted variable bias.

Table 10. Logistic Regression of Likelihood of Non-POC Arrests by Suspects with a POC

	Model 1	Model 2	Model 3	Model 4
POC Arrests	1.266*			
2+ POC Arrest		2.578***		
2 POC Arrests			2.228**	2.230**
3+ POC Arrests			3.384***	
3 POC Arrests				7.538***
4+ POC Arrests				1.792
BCSO	2.054**	2.096**	2.119**	2.069**
Age	1.091**	1.081**	1.081**	1.081**
Age ²	0.999***	0.999**	0.999*	0.999**
Male	2.158***	2.178***	2.195***	2.193***
Black	2.355	2.447	2.368	2.467*
Asian	0.786	0.772	0.760	0.743
American Indian	1.852	1.776	1.837	1.831
Unknown Race	0.882	0.869	0.891	0.894
N	697	697	697	697
Pseudo-R2	0.064	0.076	0.077	0.083
AIC	836.258	825.785	826.717	824.203
BIC	881.726	871.253	876.732	878.764

* p<.05 ** p<.01 *** p<.001

In Model 1 we see a significant positive relationship between counts of POC arrests and the likelihood of having non-POC arrests within the subsample; a one POC arrest increase yields approximately a 27% increase in the odds of having a non-POC arrest. Model 2 shows a simple comparison of individuals with two or more POCs against a reference category of suspects with one POC. We see a highly significant odds ratio, with those in the 2+ POC category approximately two and a half times as likely to have a non-POC arrest. In Model 3, we see separation of the 3+ POC individuals from 2 POC produces significant effects for both dummies. As the count of POCs increases, we see a relatively constant increase in predicted non-POC

arrests. In the final model an interesting anomaly manifests; in separating the 3 POC group from the 2 POC and 4+ POC group, we see a statistically significant difference of substantial magnitude. Under Model 4, while those with 2 POC are approximately twice as likely to have a non-POC arrest as those with a single POC, the 3 POC group is more than seven times as likely to have a non-POC arrest while those with more POCs are not statistically significantly different from the baseline. This is a strange phenomenon and appears to be driven by repeat-player outliers; of the 19 individuals in the sample with three POCs, all but two have four or fewer non-POC arrests while the remaining two have twelve and twenty non-POC arrests. There are two similar high non-POC arrest count outliers (16 and 19) in the group of 22 individuals that make up the 4+ POC category. It is clear, then, that high counts of POCs are correlated in some way with high counts of non-POC arrests, but the majority of high-POC count individuals have few or no non-POC arrests; this is likely related strongly to both the form of mental illness present in these individuals and the unobserved conditions of their life such as homelessness and substance abuse. It is also important to qualify these results as a cross-sectional analysis cannot establish temporal order; we do not know if non-POC arrests occurred after POC arrests or vice versa, consequently it is uncertain whether any observed relationship is actually due to non-POC arrests predicting POC arrests rather than vice versa.

Beyond the independent variables of interest, all controls were extremely stable across the four models, though substantively interesting. While the proportion of arrests conducted by BCSO, in prior models, was a negative predictor of POC arrests, here we see it is a positive predictor of non-POC arrests; this may indicate BCSO, as opposed to CPD, is more likely to make non-POC arrests of mentally ill individuals. Alternatively, it may simply be a function of jurisdictional and contextual differences that are unobservable in these data. Age has a

relationship similar to previous models. Male gender here is a very significant positive predictor of non-POC arrests for those with a POC; this is logical as men are substantially more likely to participate in most forms of crime than women and there is little reason to believe this would be different in the subpopulation of potentially mentally ill individuals. Lastly, in only Model 4, we see the Black racial dummy becomes a significant positive predictor of non-POC arrests, though it is borderline in the prior models. This may be a manifestation of some level of cumulative disadvantage for mentally ill Blacks or could be driven by outlier effects as discussed earlier.

Discussion

This section aims to synthesize the above analysis of arrest data with the available literature on police contacts with the mentally ill and knowledge of the socioeconomic and institutional context of Benton County. Ramifications of the quantitative findings are discussed, particularly in how they relate to the structure of the mentally ill population in the area, which leads into a discussion of the potential origins of the present mental health crisis, for which three hypotheses are provided. Then, given the constraints and capabilities of local institutions, four tentative policy recommendations are provided that may maximize the community's ability to respond to the problem without wasting scarce resources.

Analyses of the available arrest data both answer existing questions and raise a variety of new ones. The data firmly establish that there has been a sudden increase in contacts with mentally ill individuals in the community, which appears to be independent of all available community-level predictors of mental illness, and a substantial population of “repeat players” is responsible for a disproportionate number of arrests; the massive increase in POC arrests in 2012 appears to be driven chiefly by increased contacts with these “repeat players”. On the other hand,

the majority of those arrested with POC charges are detained only once, at least within the span of our sample, and even those arrested multiple times are usually not arrested for other offenses; the factors that separate true "repeat players" responsible for disproportionate expenditures by Benton County law enforcement are currently unknown. Additionally, the community-level factor (or factors) responsible for the recent increase in contacts is completely unknown, but a variety of new avenues of research are open for exploration. Based on the limited available data, literature content, and information acquired from local institutions, the following three primary hypotheses, which are not mutually exclusive, are provided as potential explanations for the existing mental health crisis: Poorly measured known predictors such as homelessness, unobserved structural changes such as policy change or hospital closures, and increased police awareness.

While the analyses in this work examine a limited selection of known aggregate predictors of community-level mental illness, such as unemployment and homeless counts, there are omitted or poorly measured variables that may in part be driving the increase in contact with the mentally ill. For instance, the yearly one-day homeless counts may not be robust measure of homelessness in an area for a variety of reasons; the homeless are a hidden population for which it is difficult to acquire reliable statistics, even of general population size, with any confidence, with simple methods (Tsemberis et al., 2007). Many homeless individuals do not stay at shelters, for instance if local institutions do not tolerate substance use which is associated with mental illness. Also, related to homelessness, we lack good measures of the impact of rising housing prices and subsequent housing insecurity on mental illness in the area. Given the housing situation in Corvallis, this may be a notable contributor, but if contacts with the mentally ill are increasing in neighboring areas without similar housing issues it would cast doubt on this

factor. Future research should seek out and explore any possible unexamined, or improperly examined, aggregate predictors.

Unobserved structural changes in the handling of mental illness in the region are also a possible cause of the rising trend. Local mental health and law enforcement representatives have suggested in meetings that the closure of the state-run mental hospital in Salem, prior to finishing construction of new facilities, may have resulted in a regional increase in the mentally ill due to insufficient facilities for commitment and treatment. If this is the case, we would expect to see similar increases in contacts with the mentally ill in neighboring counties; recent statistics from the Albany Police Department, located in Benton County's neighbor to the east, Linn County, suggest an increase of similar magnitude, though more linear, in mentally ill contacts in that area. These data can be seen, and are briefly discussed, in Appendix 5. Additionally, it is possible that unmeasured changes in policy regarding law enforcement practices, mental health treatment, substance use treatment, corrections practices, or any number of other institutional behaviors could be driving some degree of the increases in mental health contacts. A county-level policy change hypothesis would be called into question if the recent increase in mentally ill contacts has been mirrored in neighboring counties, however. Additionally, it is uncertain why changes in local police policy would produce a proportionally larger increase in arrests of "repeat players" compared to single-incident individuals as seen in figure 5.

Related to unobserved structural changes, the discrepancy between the trends in yearly BCSO and CPD POC arrests, as well as statistical significance of lagged mental health event dummies in monthly data, described in the yearly analysis section raises a potential hypothesis of increased institutional awareness as a driving factor of the recent crisis; BCSO POC arrests appeared to spike in 2011 while CPD experienced no similar increase. As the majority of major

literature on police practices regarding the mentally ill has developed very recently, most after 2009, and recent high profile violent events have brought the issue to the forefront of public discourse, it is possible that some level of the rise in POC arrests is due to greater awareness on the part of law enforcement officers of the importance of dealing with the mentally ill. This would suppose that, based on the existing data, BCSO reacted earlier to emerging literature and media coverage and awareness of the issue diffused to CPD by the following year, whether through interagency knowledge exchange or through independent exposure. Testing this hypothesis would be challenging and if validated, it could be interpreted as evidence of underreporting in the past, with the current levels, which are considered unacceptably high by all agencies involved, being more accurate measures of the incidence of mentally ill contacts. Nonetheless, it could indicate that the issue is more serious and enduring than current arrest data indicates.

Given the limited information available to policymakers, the hypotheses outlined above, and the institutional constraints in Benton County, four conservative and tentative policy recommendations can be made. 1) Implement CIT training for both BCSO and CPD which helps bridge the “service gap” between mental health and law enforcement without exceeding available police resources, though the large number of "repeat players" may mitigate the benefits of this approach. 2) Improve coordination of local law enforcement, social services, and the hospital to improve efficiency and effectiveness of existing responses. 3) Pursue outside sources of funding, such as MIOTCRA grants, to improve and expand underfunded mental health programs and local collaboration efforts. 4) Collect and analyze additional data, both quantitative and qualitative, to better understand the underlying causes, and, importantly, consequences, of the crisis. The latter three policy suggestions are to some degree already being pursued by local

agencies with the assistance of a work group from Oregon State University, of which the author is a member.

As discussed in the literature review of this work, CIT training has been shown to be a cost-efficient and effective means of addressing mentally ill contacts with police in a large number of diverse communities throughout the United States. In Benton County police are already the primary responders to serious mental health incidents in the community and this is likely to continue in at least the near term due to limited mental health resources and differing institutional priorities. It is likely CIT training would improve officer safety, increase the success of mental health referrals, shorten service calls, and reduce the number of mentally ill suspects in custody; collectively this would reduce use of police resources while improving outcomes for mentally ill suspects. This policy change would not be unilateral however, as cooperation with local mental health services is a vital component of effective implementation of CIT practices. In particular, as discussed earlier, CIT has been found to be most effective when a no-refusal mental health drop-off location is provided for police. Diversion of mentally ill suspects from the criminal justice system also requires adequate local mental health resources; if funding for services is insufficient, corrections will continue to absorb the residual individuals with chronic untreated mental illnesses. Regardless, CIT training is relatively inexpensive and easy to implement and serves to address the local problem regardless of the underlying cause, making it an attractive policy option as an immediate response.

On the other hand, if the majority of recent increases in POC arrests in Benton County is being produced by a subpopulation with chronic mental illness, it is possible that any police-oriented response will be an inefficient use of resources; police are best suited to handling individuals with single severe mental health incidents while mental health treatment represents

the more effective path for addressing those with chronic mental illness. In 2012, a substantial number of new individuals with repeat mental health related arrests appear to have entered the "service gap" between local mental health providers and police. Reevaluation and adjustment of the target populations of local mental health services, though outside the scope of this work, may be necessary to produce an effective and cost-efficient long term policy response to the sudden increase in "repeat players".

Related to the prior recommendation, improved collaboration between all local agencies involved in handling the mentally ill is critical to combating the rise in police contacts. The literature indicates that services for the mentally ill are most effective when they integrate mental health and substance treatment with housing services in conjunction with open information sharing with law enforcement; an integrated consumer-oriented service plan is the ideal response to mental illness and associated challenges. To facilitate this, the work group from Oregon State University has begun preliminary work at establishing a collaboration effort between local agencies that provide services or frequently encounter the mentally ill; this document is one component of the initial research designed to create a foundation for this effort. The structure this collaboration will take is presently unknown, but it is an important development that will inform and assist in the design and/or implementation of the other policy recommendations presented here.

Seeking outside funding should be a primary goal both of individual agencies involved in responding to the mentally ill and any collaboration effort. One of the early products of the collaboration was a MIOTCRA grant proposal to the Bureau of Justice Assistance for the funding of initial research and development into an effective effort to address mental illness in the community in 2014. This grant would fund continued, but more thorough, research similar to

the present study in addition to research to fully understand the institutional context in Benton County which is necessary to produce an effective collaborative effort. Continuing funding could be used to implement programs like CIT training, a mental health court, or other interagency approaches to mental illness in the community. Any similar funding opportunities from state or federal sources should be pursued by all agencies involved, both individually and collectively, as additional resources are likely necessary to successfully address the growing problem in Benton County.

Lastly, a great deal of additional data must be collected to allow researchers to uncover the causes and consequences of the mental health crisis in Benton County. As described earlier, accurate data on aggregate predictors and institutional factors that impact community-level rates of mental illness are sorely lacking. Robust measurements of homelessness, for instance, might reveal an underlying cause, and may also prove useful to local social service providers. Further research into the individual-level determinants of “repeat player” behavior is also strongly warranted as it is not presently clear what determines the persistent criminal or disruptive behaviors of the chronically mentally ill in this community. Additionally, the time and monetary costs to law enforcement and corrections of repeat contacts with the mentally ill are also unknown and might help inform appropriate policy responses to the issue; if law enforcement costs can be shown to be disproportionately high, it may motivate the direction of public funding toward more cost-effective preventative measures on economic grounds, while simultaneously improving outcomes for the mentally ill. Improved data collection and sharing on both police contacts with the mentally ill and the general population of chronically mentally ill individuals in Benton County should also be pursued to better understand the local context and improve direction of resources.

Conclusion

While the underlying causes of the sudden increase in police contacts with the mentally ill in Benton County remain elusive, this work presents an important first step in addressing the problem. While its onset appears to have been rapid, the crisis Benton County is facing is not uncommon in the United States; consistently low levels of mental health funding in communities throughout the country have left police to be the first point of institutional contact with the seriously mentally ill. Conventional police responses, however, are often detrimental to the long term well-being of the mentally ill and are more costly than specialized responses, particularly when suspects enter the corrections system; additionally, traditional responses to the mentally ill are associated with higher risks to both police and suspects. As the majority of communities cannot afford to implement dedicated mental health first responders, most approaching this problem have produced hybrid responses that leverage existing resources with interagency cooperation; these include CIT training and mental health courts, both of which have been shown to be effective at reducing law enforcement costs and diverting the mentally ill from corrections. Fortunately, outside funding, particularly from recent federal legislation, is available for communities facing these challenges. Development of similar strategies in Benton County, with assistance of outside funding if possible, is likely the best approach to the existing problem, though continued research will be necessary to adjust this response.

Quantitative analysis of six years of Benton County arrest data, aggregated in various forms to explore a wide range of factors, produced the following primary findings: 1) There appears to be a small subpopulation of the mentally ill responsible for a disproportionate number of arrests, particularly in 2012, though the characteristics that define members of this population are not well known. 2) There is limited but notable evidence that the number of POC arrests may

be influenced by non-policy and non-structural factors such as high-profile violent events. 3)

None of the well-known community-level predictors of rates of mental illness appear to be responsible for the recent increase in contacts. These findings are of limited utility in confronting the Benton County crisis, and primarily serve to push research in a number of new directions.

Better data is needed to rule out additional community-level predictors, such as accurate homelessness counts, and improve our understanding of what predicts "repeat-player" mental illness behaviors. It is also unclear, and outside the scope of this work, to what degree the problem is localized to Benton County; data from neighboring counties and the state as a whole may reveal the magnitude of the issue, which would allow more informed approaches as policy develops.

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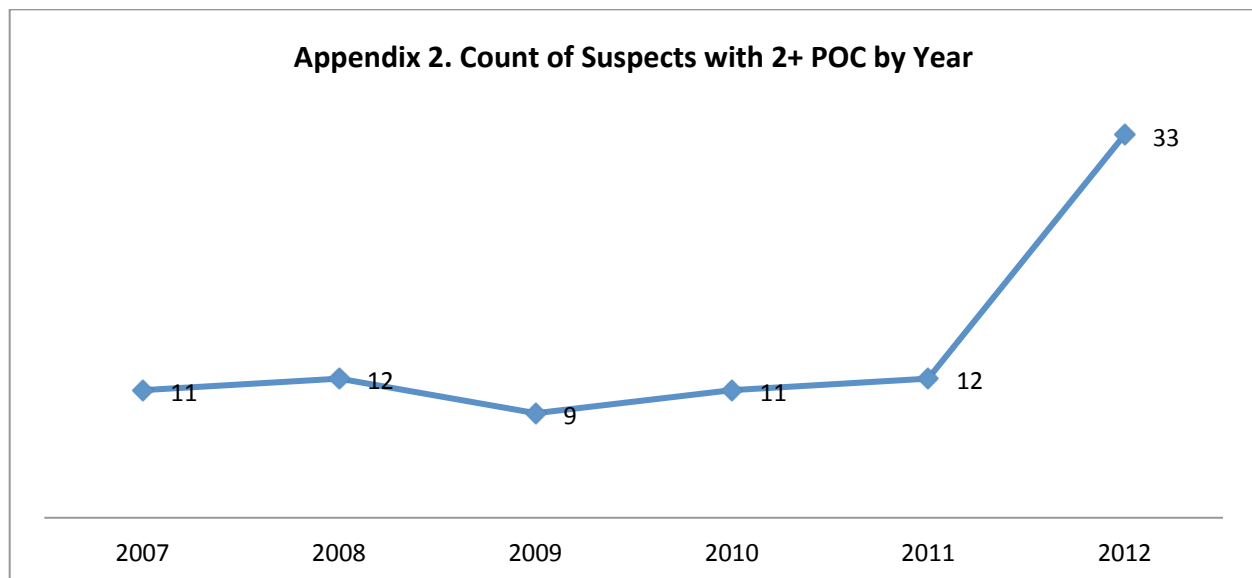
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Appendices

Appendix 1. Dummy Variables: Mental Illness Associated Violent Events

Event Dummy	Date	Description
Clackamas	12/11/2012	Shooting in Clackamas Town Center, OR
Sikh	8/5/2012	Sikh temple shooting in Oak Creek, WI
Aurora	6/20/2012	Shooting in theater in Aurora, CO
Carson	9/6/2011	Shooting in IHOP in Carson City, NV
Giffords	1/8/2011	Shooting of Rep. Gabby Giffords in Tucson, AZ
FtHood	11/5/2009	Mass shooting at Fort Hood army base in Texas
VTech	4/16/2007	Virginia Tech massacre

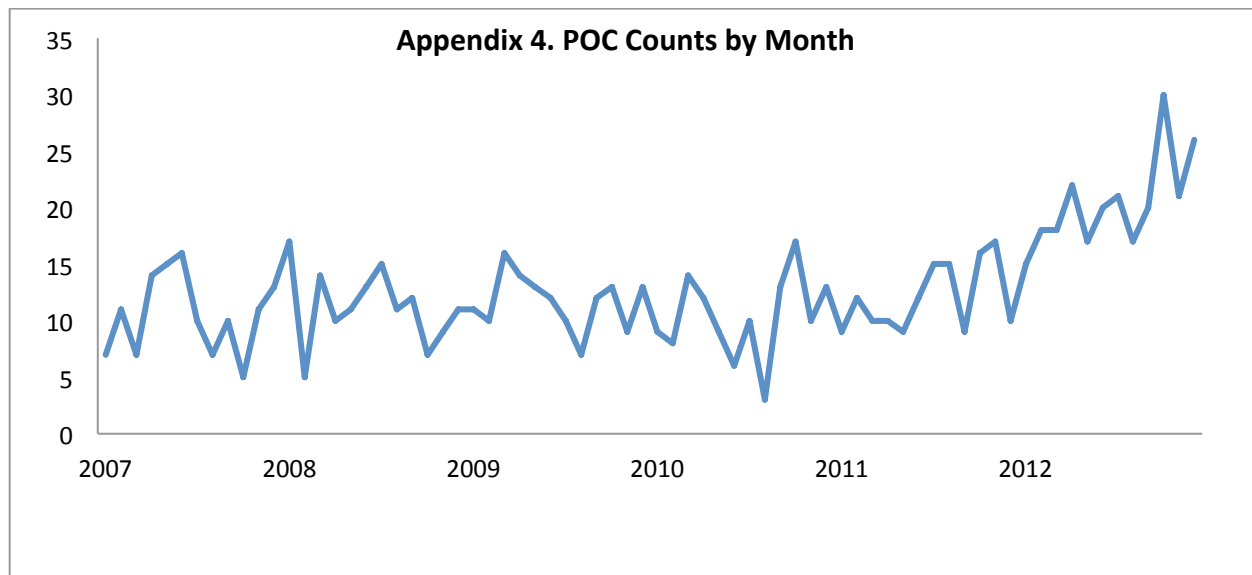


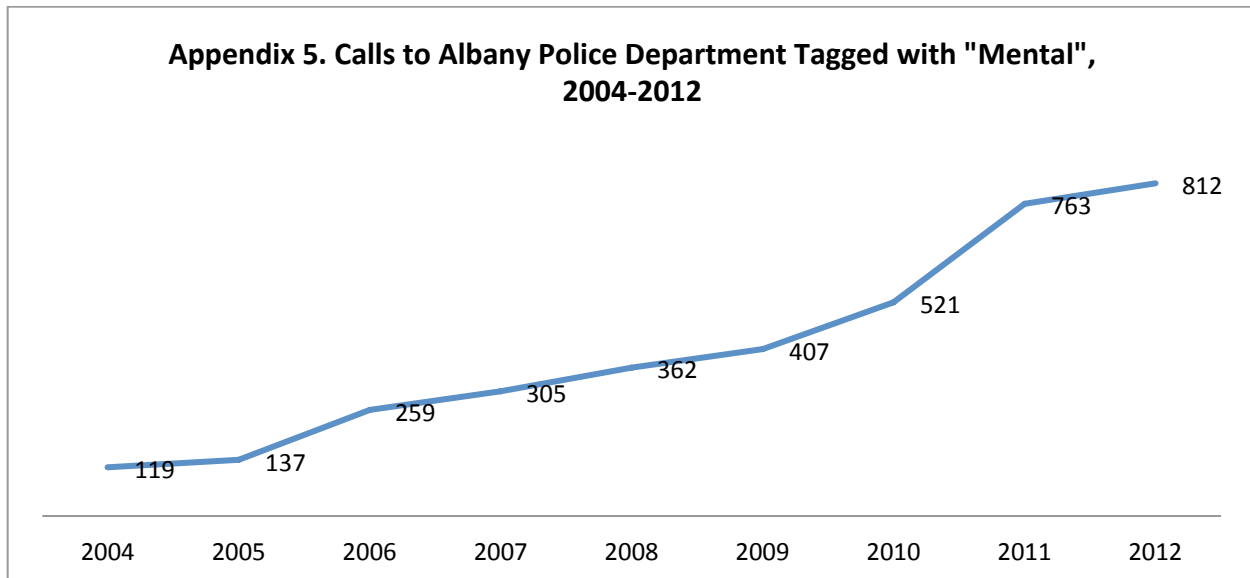
Appendix 2 depicts counts of individuals with more than one POC in a given year; this is a relatively crude measure of the number of “repeat players” coming in contact with police each year. It is clear that this figure is extremely stable from 2007 to 2011, but triples in 2012; the increase in POC arrests in 2012 may be due in part to substantial growth in this population. It may also be indicative of changes in police policy or mental health services. It is worth noting that these data in no way capture all “repeat players” as Table 5 indicates there are 697 individuals with 2+ POCs across all five years combined; this graph includes only 88 of those individuals, though it is possible these may represent more frequently encountered individuals as their POC arrests are clustered within years.

Appendix 3. Negative Binomial Regression of POC Arrests by Month

	Model 1	Model 2	Model 3	Model 4	Model 5
Non-POC Arrests	-0.0001	0.0004	0.0001	-0.0000	-0.0004
Drug Possessions	0.0063	-0.009	-0.0012	-0.0023	-0.0033
2012		0.6101***	0.5859***	0.6167***	0.4555***
L1.POC					0.0170**
Clackamas			0.2561***	0.2392**	0.2309***
Sikh			-0.1855	-0.2198	-0.2422**
L1				-0.0216	
Aurora			-0.0055	-0.0158	0.0390
L1				-0.0083	
Carson			-0.2355***	-0.2166***	-0.3192***
L1				0.3963***	
Giffords			-0.2200***	-0.1922**	-0.2413***
L1				0.1039	
Ft. Hood			-0.2236***	-0.2065***	-0.2517***
L1				0.1394*	
Illinois			-0.8160***	-0.8133***	-0.9215***
L1				0.2007***	
Virginia Tech			0.1943**	0.2202*	0.2250***
L1				0.3172**	
Constant	2.3875***	2.3192***	2.4172***	2.4844***	2.2225***
N	72	72	72	72	72
BIC	438.0251	398.7349	420.3415	440.2737	381.5665
AIC	428.9184	387.3515	393.0215	397.2828	370.2531

* p<.05 ** p<.01 *** p<.001





Appendix 5 depicts data obtained from the Albany Police Department. To quote,

“The numbers [above] indicate how many police reports we took each calendar year where the term “mental” was typed into the narrative of the computer generated report. Although these stats are not 100% accurate as to how many “mental” calls we handle, they do show a pattern and a drastic increase beginning in 2006 as you see. In addition, from 2004 to 2010 our crime rate has steadily declined which make these numbers even more significant. Since 2011, our crime rate has slightly risen,” (Jeff Hinrichs, personal communication, May 13th, 2013)

Accordingly, these data are not directly comparable to the arrest data provided by Benton County authorities, but they do indicate there may be a similar trend manifesting in Linn County.