Vulnerable Population Strategic Initiative

A Shoreline Fire Department/Emergency Medical Service Program Analysis

Prepared for
Emergency Medical Services Division
Seattle-King County Public Health

By
Lori Jarrett, MPH
Executive Master of Public Health Program
University of Washington

June 15, 2015

Background

Up to 30% of the US population has some form of mental illness, substance abuse, or a combination of both. Millions of people are undiagnosed, underdiagnosed and receive either inadequate or no treatment. Contributing factors are de-institutionalization of the mentally ill, inadequate or lack of insurance coverage[1], unemployment, poverty[2] and the growing homeless population[3].

The mentally ill and substance abusers live in our community, often with few resources, alone or with others who are unable or unwilling to provide adequate support. When other community members or the mentally ill and substance abusers themselves perceive a need for help, a typical response is to call 9-1-1. A recent retrospective analysis of 412 homeless individuals in Boston found that in those with a history of illicit drug use, mental health was predictive of frequent use of emergency services (OR 2.53, 95%).[4] According to the Substance Abuse and Mental Health Services Administration (SAMHSA), the presence of structural barriers is one of the reasons that those who need services do not receive them. Alang's (2015) analysis of data on 2,564 people with unmet mental health needs confirmed the perception of structural barriers (29.16%) and identified other reasons: cost/insurance (51.19%), perceived stigma (23.3%), minimization (24.94%), and low perceived effectiveness of treatment (8.51%).[5] A 2008 study examined socio-demographic and diagnostic factors as predictors of repeat visits to emergency psychiatric services. The only non-diagnostic predictor was repeat use of emergency services in the prior 18 months, implying that repeat callers rely on emergency services as continuing care.[6] Knowlton et al found that mental health or substance abuse problems were the most frequent reasons for emergency medical service (EMS) use (23.4% of calls). Their findings indicate that service coordination is needed among EMS and community-based health services.[7]

King County, Washington has a diverse population of about 2,100,000 people. About 30% are non-white, almost 26% use a language other than English at home[8], and almost 38% have incomes at or near the poverty level. In King County, mental illness is the 3rd and 4th leading cause of hospitalization for females and males, respectively[9]. From 2009-2013, 10% of County residents had frequent mental distress (at least 14 days in the last 30 with poor mental health). The rate was 2.4 higher in households with income under $15,000 and higher for Hispanics, blacks and those of multiple races. According to members of the King County collaborative,

"Hospitals for a Healthier Community", a key issue related to behavioral health was access to care. Members of vulnerable populations have difficulty accessing care and require a high level of social service engagement.[9, 10]

As illustrated, its diversity contributes to the County's disparities in health status and access to health care and insurance coverage. Those affected by these disparities often contact emergency medical services for health care services in disproportionate numbers since no other means are available. This provides emergency medical service units with a unique window to identify and address health care disparities in the community and among vulnerable populations in particular[11]. Those with mental illness and/or substance abuse are considered to be vulnerable populations.

The King County Emergency Medical Services (EMS) Vulnerable Populations Strategic Initiative (VPSI) is a collaborative effort of the EMS Division, Public Health – Seattle & King County, fire departments, community-based organizations and the University of Washington (UW) to ensure a high quality interface between EMS and vulnerable populations. VPSI activities include programmatic, scientific and case-based evaluations that focus on:

1) Successful communication with 9-1-1 dispatch
2) Best practices for on-scene care
3) Follow-up and community services

Key VPSI objectives include the

1) identification of needs and the development of strategies to improve EMS care for vulnerable populations, and
2) cultivation of ongoing partnerships with County agencies and programs that serve vulnerable populations.[11, 12]

Shoreline, an area within King County, has a population of about 55,000 with diversity and health care disparities mirroring those of the County.[13] The Shoreline Fire Department/EMS has expressed concern that they frequently respond to 9-1-1 calls from those who are mentally ill or substance abusers without an adequate ability to connect them with appropriate health care resources (M. Plorde, Personal Communication, December 5, 2014). This deficit impacts the community by:

- underserving those in need, resulting in persistence or worsening of illness and co-morbidities;
- reducing the ability of those in need to contribute to the community
- reducing efficiency in the use of FD/EMS resources
- decreasing job satisfaction among FD/EMS staff
- increasing the potential for the development of compassion fatigue among FD/EMS staff, which could impact service quality

Continuing their participation in VPSI efforts, the Shoreline FD and the County initiated a problem analysis project with the following objectives:

1) Problem Description: define and characterize the problem by summer, 2015 with participation from FD/EMS staff, the Deputy Director of King County Emergency Medical Services and a UW graduate student (the project team)
2) Solution Development and Proposal: design at least one solution to the problem including detailed work flow and database framework by utilizing the skills and education of the UW graduate student, and implement a pilot over the last half of 2015 with support from the project team
3) Solution Evaluation: the project team will evaluate the pilot by summer 2016 using data collected in the project database, and write a summary report for leaders at Seattle-King County Public Health and King County Emergency Medical Services

Methods

Methods used in the preparation of this report include:

- A literature review to define and quantify the problems of mental illness and substance abuse
- Interviews with fire department staff and FD/EMS crew members to gain insights into the nature and scope of interactions with the mentally ill and substance abusers, opinions about the success of those interactions, and impact on job satisfaction
- Meetings with the project team to facilitate information exchange, problem identification and the formation of the work flow in the pilot project

- FD/EMS database searches and incident report reviews to inform the scope and nature of the problem
- Frequent telephone meetings with Michele Plorde, Deputy Director of EMS, were essential to formulation of the problem, identification of available resources, adherence to the project timeline, and education about the FD/EMS system as a whole and Shoreline in particular.

Problem Description

Definitions of mental illness are scanty and introduce significant subjectivity in their interpretation. For example, the National Alliance on Mental Illness offers this definition: "A mental illness is a condition that impacts a person's thinking, feeling or mood (and) may affect his or her ability to relate to others and function on a daily basis. Each person will have different experiences, even people with the same diagnosis."[14] The Centers for Disease Control definition: "Mental illnesses refer to disorders generally characterized by dysregulation of mood, thought, and/or behavior, as recognized by the Diagnostic and Statistical Manual, 4th edition, of the American Psychiatric Association (DSM-IV). Mood disorders are among the most pervasive of all mental disorders and include major depression, in which the individual commonly reports feeling, for a time period of two weeks or more, sad or blue, uninterested in things previously of interest, psychomotor retardation or agitation, and increased or decreased appetite since the depressive episode ensued."[15]

The World Health Organization defines substance abuse as "the harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs. Psychoactive substance use can lead to dependence syndrome - a cluster of behavioural, cognitive, and physiological phenomena that develop after repeated substance use and that typically include a strong desire to take the drug, difficulties in controlling its use, persisting in its use despite harmful consequences, a higher priority given to drug use than to other activities and obligations, increased tolerance, and sometimes a physical withdrawal state."[16]

An English language literature review by Morisano, et al concludes that there is a high prevalence of dose dependent co-occurring mental illness and substance abuse *($p<.01$)*, and that

the co-occurrence is related to more severe illness and course, more difficult treatment, worse social consequences, and worse outcomes compared to single illness occurrence.[17]

The SAMHS's National Survey on Drug Use and Health reports 9.3% of Seattle-Tacoma-Bellevue residents age 12 years and older had a substance abuse disorder in 2005-2010, similar to Washington state and national prevalence.[18]

During interviews with FD/EMS staff, current work flows were reviewed. The most prominent feature of all the discussions was staff compassion for these vulnerable populations, driving their desire to better identify and connect those afflicted with appropriate care. Staff and crew described a sense of feeling overwhelmed at times by the frequency of calls related to mental illness and/or substance abuse, and by the futility of their responses, because many were left untreated at the scene and even those transported to emergency rooms were discharged almost immediately, only to make repeat 9-1-1 calls. The Education and Outreach Coordinator felt she spends at least half her time attempting to connect those referred to her to appropriate services, at the expense of outreach and education services provided to other populations. Other crew members felt that the majority of calls are either primarily or secondarily related to mental illness, perhaps more so than in other Seattle areas due to the high volume of adult family homes in Shoreline, and community mobility facilitated by the transection of Shoreline by Interstate-5 and Aurora Avenue.

The FD/EMS crew member assigned as the point person for discussion arrangement and data acquisition discussed the problem, its implications and potential solutions frequently, in person and via email correspondence, from January through May, 2015.

Review of Incident Reports provided details of interactions between callers and FD/EMS workers, which were useful in understanding the scope of the problem, the huge heterogeneity of the patient populations, the range of responses required, and the development of the pilot project work flow. Incidents referred by FD/EMS crew members to the Shoreline Education and Outreach Coordinator over a two year period were reviewed for several weeks beginning on January 21, 2015. These incidences are a subset of all 9-1-1 calls and reflect crew attempts to

address, via referral to the Outreach Coordinator, health problems that could not be fully resolved during responses.

All incident reports from July 1 to July 15, 2014 were reviewed to provide perspective on the nature, range and severity of all 9-1-1 calls. About 17% of the calls were related to mental illness or substance abuse, a somewhat higher figure than that provided by database queries, providing insight into the potential for under-reporting and need for additional training in the utilization of the ESO reporting mechanism.

King County Medic One/EMS responds to 9-1-1 calls throughout the County in a system of coordinated care. Over 3,700 Emergency Medical Technicians (EMT) provide Basic Life Support (BLS), first-on-scene medical care and are based in fire stations. Advanced Life Support (ALS) is the regional paramedic service of 26 units provided by six agencies throughout the County.[8]

In 2014, alcohol/drug use and psychiatric problems were the primary reasons for 11.2% of BLS responses and 8.3% of ALS responses County-wide (D. Sharkov, Personal Communication, May 5, 2015).

Table 1. King County EMS, Reasons for Response, 2014

	ALS (%)	BLS (%)
Cardiovascular	8902 (24.7)	12,458 (8.7)
Neurologic	5960 (16.5)	22,922 (16)
Respiratory	4888 (13.6)	10,929 (7.6)
Trauma	2944 (8.2)	35,011 (24.4)
Alcohol/Drug	**1775 (4.9)**	**7917 (5.5)**
Abdominal/Genito-Urinary	2017 (5.6)	12,526 (8.7)
Metabolic/Endocrine	1279 (3.5)	3419 (2.4)
Psychiatric	**1218 (3.4)**	**8240 (5.7)**
Anaphylaxis/Allergy	487 (1.4)	1295 (0.9)
Obstetric/Gynecological	421 (1.2)	1105 (0.8)
Other Illness	6139 (17)	27,487 (19.2)
Total	36,030	143,309

In Shoreline, for the same period, the response rates were higher for alcohol/drug and psychiatric reasons (D. Sharkov, unpublished data, EMS division SKCPH, May 11, 2015). In part this may be because Interstate-5 and Aurora Avenue run through Shoreline, making it easily accessible via public transportation. Accessibility will increase with the addition of light rail planned to run through Shoreline along I-5 by 2023.

Table 2. Shoreline EMS, Reasons for Response, 2014

	ALS (%)	BLS (%)
Cardiovascular	1032 (27.7)	500 (10.2)
Neurologic	490 (13.2)	618 (12.7)
Respiratory	431 (11.6)	333 (6.8)
Trauma	224 (6.0)	1035 (21.2)
Alcohol/Drug	**323 (8.7)**	**447 (9.2)**
Abdominal/Genito-Urinary	213 (5.7)	485 (9.9)
Metabolic/Endocrine	158 (4.2)	97 (2.0)
Psychiatric	**160 (4.3)**	**340 (7.0)**
Anaphylaxis/Allergy	57 (1.5)	45 (0.9)
Obstetric/Gynecological	33 (0.9)	29 (0.6)
Other Illness	602 (16.2)	955 (19.6)
Total	3,723	4,884

In Shoreline, most callers to 911(68.7%) are between the ages of 25 and 64 (D. Sharkov, Personal Communication, May 5, 2015), a number that remains consistent within the alcohol/drug and psychiatric categories of calls.

Historical data on repeat calls is not available. FD/EMS staff report that repeat calls are common occurrences, vary in frequency per person per year from 1 to up to 100 or more, and are more frequent among those with alcohol/drug and psychiatric problems.

Alcohol/drug and psychiatric reasons for response differ from other acute reasons like injury or infection in that they represent chronic illness that cannot be fully treated with one or two provider visits. Ironically, those afflicted have conditions such as psychosis, depression or ingestion of mind-altering substances that greatly influence brain function but are in need of long-term services that require the ability to perform complex tasks like planning and care coordination.

A current Shoreline follow-up practice after calls related to mental illness and substance abuse is case-by-case referrals in the form of emails from FD/EMS crew members to the Department's Education and Outreach Coordinator. Those referred have an array of problems of varying severity and urgency, making it difficult for the Coordinator to prioritize and respond to requests in a timely manner. Further, despite the good intentions of FD/EMS crew, referrals are made inconsistently and often in response to a particularly unsettling service call, frustration over repeat calls, and the perception of an inadequate ability to connect people with psychiatric and alcohol/drug problems to appropriate care.

In 2014, 698 King County Fire Department personnel completed a vulnerable population needs assessment survey in which the Shoreline FD participated. Results indicate that patients who are institutionalized (59%), are under the influence of alcohol or drugs (78%), or are mentally ill (66%) pose the biggest challenges in service delivery all of the time or frequently (as compared to infrequently or never), and communication challenges are greatest with the latter two groups. Those surveyed commented about challenging populations:

"Patients under the influence of alcohol or drugs and the homeless population. Often times these groups are the same. We will frequently be called to these patients for transport to the hospital because they are hungry and cold or need somewhere to stay. They also often times make up illness or injury in order to be transported to the hospital."

"Patients with mental health conditions. There are no real resources to help them when they call 9-1-1 and don't need ER evaluations. We often send them to an ER because that's the only option. ER releases most of them immediately and they come home and call 9-1-1 for the same exact issue. It's a revolving door with no answers. These people often live alone and have no support networks for the daily problems and feel 9-1-1 is their only option for attention."

Tools/technologies to assist in patient referral to alternative services were rated as very useful (48%) or somewhat useful (44%). Only 7% felt such tools would not be useful (H. Meischke and M. Plorde, Personal Communication, May 22, 2015).

In summary, about 10% of King County's population has a mental illness or substance abuse disorder, with rates over 2 times higher for those who are non-white or with low income. In 2014 these diagnoses accounted for 13% of 9-1-1 calls to Shoreline FD/EMS. The FD/EMS

crew believe that current practice does not adequately serve the mentally ill and substance abusers.

As a solution the team proposed a dedicated professional skilled in social services – a social worker with a master's degree (MSW) - could help provide additional data about the problem and assist members of this vulnerable population in service access and care coordination.

Solution Development and Proposal

Pilot project inclusion criteria were identified as the first priority for resolution. Work flow was diagrammed. Specific points of discussion were the mechanisms of referral to the MSW and communication between the MSW and FD/EMS crew, details of the process to be followed by the MSW with patient interactions, desired characteristics of the contracting social services agency, the physical placement of the MSW, length of the pilot project, and appropriate project evaluation measures.

Options for the use of the FD/EMS incident report database for patient identification were reviewed and the optimal use was selected. FD/EMS training needs were identified. The process of referral to the MSW was discussed among the project team. Methods for providing feedback to referring crew members were outlined and the pilot project implementation plan was framed. FD/EMS crew will be educated about the pilot and provided training in the mechanics of patient referral to the MSW. Specific details were ironed out for feedback from the MSW to referring crew members, and the referral process itself. The plan for contracting with a local social services agency for the MSW was discussed and the target agency identified.

Understanding how the FD/EMS databases are populated and their reporting capabilities was useful in identifying their limitations and specific training needs to assure accurate and comprehensive data entry for the success of the pilot project.

Shoreline FD/EMS workers will launch a six to nine month pilot study in the summer of 2015 to investigate if

1) the problem can be further quantified for better understanding and remediation

2) the use of a dedicated MSW can be effective in identifying community members who are mentally ill and/or substance abusers
3) identified patients will agree to MSW assistance
4) those who receive MSW assistance actually access care

Using VPSI funds, the pilot will contract with a local social services agency to employ a MSW to provide dedicated follow-up with every patient identified as mentally ill or a substance abuser during 9-1-1 calls and to refer those in need to appropriate care. Though there are many social service agencies throughout the County who offer treatment and referral services for mental illness and substance abuse, the project group plans to contract with an agency in or near Shoreline to reduce access barriers to program participants.

Patient Identification

The criterion for inclusion in the pilot will be a primary, secondary or tertiary clinical impression of behavioral/psychiatric disorder or substance/drug abuse documented by FD/EMS workers in the ESO database, where all 9-1-1 responses are documented. FD/EMS workers are trained to recognize the signs and symptoms of mental illness and substance abuse. The workers are deeply immersed in the community and are experienced at responding to calls at every point along the health and wellness continuum. As such, they are in a uniquely capable position of identifying community members in need.

Workflow

When documenting a service call in ESO, FD/EMS workers complete the Clinical Impression page in the ePCR module to capture impressions of behavioral/psychiatric disorder and/or substance/drug abuse.

The Clinical Impressions page is well-suited for the pilot study because a clinical impression is a required field, and FD/EMS workers are already trained in its use. Workers will receive refresher training when the study is introduced and the workflow is explained. Consistent and accurate use of the Clinical Impression page is critical in order to assure that all eligible patients are identified.

Two FD/EMS workers will share the responsibility to screen 2-3 times per week ESO Incident Reports with Clinical Impressions of behavioral/psychiatric disorder and/or substance/drug abuse and refer eligible patients to the MSW.

The MSW will contact the patient by phone or in person to follow-up on the service call, describe the pilot, and request participation. If the patient declines, there will be no further follow-up from the MSW and the refusal will be documented. If the patient agrees, the MSW will complete an assessment, refer the patient to care services and coordinate services among existing or new case managers and providers. The MSW will maintain contact with the patient to determine if care services are accessed.

The MSW will provide regular feedback on patient outcomes to FD/EMS workers. The workflow is diagrammed in Appendix A.

Solution Evaluation

Data will be collected to further define the problem and barriers to care, and to evaluate pilot performance. The database framework is illustrated in Appendix B and is intended to capture these elements:

- Demographics of referred patients
- Percent of patients who agree to participate
- Percent of patients who access services
- Number of FD/EMS calls per patient enrolled, prospectively and retrospectively
- Reasons for non-participation and failure to access services

Data analysis will inform decisions made by County leaders about the success of the pilot. Positive results may include a demonstration of feasibility by a high participation rate, or favorable outcomes based on the percent of patients who access services and/or a reduction in repeat 9-1-1 calls. If leaders deem the pilot a success its procedures may be adopted by other King County FD/EMS crews.

Limitations

Subjectively, FD/EMS workers interviewed believe the problem is much larger. If so, there may be under-reporting or miscoding of clinical impressions, which could exclude eligible patients. This potential training need will be addressed prior to pilot start with refresher training to optimize appropriate and consistent use of the Clinical Impressions page in ePCR.

The available databases are unable to provide reliable data about the frequency of repeat callers, though subjective data indicates that the population of interest makes repeat calls of varying frequency. However, once patients are enrolled in the pilot project, it is feasible to prospectively and retrospectively review databases for information about call frequency.

If mental health or substance abuse is a tertiary impression or both are present and there is a primary impression other than mental health or substance abuse, there is no way to capture all the data on the ePCR Clinical Impressions page, resulting in under-reporting and possible exclusion of eligible patients.

Inability to overcome structural barriers to appropriate care is just one reason why those in need may not receive care. Other reasons could include lack of desire or social support, co-morbid conditions that are more serious or disabling, and other psychological factors such as shame or

embarrassment. However, in addition to addressing structural barriers, MSW engagement could help mitigate the negative effects of inadequate social support and psychological factors. Further, data collected during the pilot will help characterize other reasons, which will help guide future interventions.

There could be selection bias. Those patients who agree to enroll in the pilot project might have been most likely to seek help on their own. It's possible that those who don't enroll are most in need of help and will perpetuate the problem despite pilot project efforts.

Minors will not be included in the pilot because they constitute a small part of the call volume and in many cases cannot provide consent. Conclusions and recommendations made at the end of the pilot will be applicable only to the adult population.

Conclusions

As evidenced by strategic initiatives, the Shoreline Fire Department/EMS in partnership with King County is committed to identifying vulnerable populations and optimizing their care. Those with mental illness and substance abuse are vulnerable populations in need of specialized efforts to obtain appropriate care. Despite its limitations the proposed pilot project will provide information about the ability of a MSW to connect these populations to care, as well as data about causes of failed access. Pilot data will help to further characterize the mentally ill and substance abuse populations and inform future interventions in Shoreline and throughout King County.

References

1. http://www.kingcounty.gov/healthservices/MentalHealth/Information.aspx. Accessed March 9, 2015.

2. http://www.who.int/mediacentre/factsheets/fs220/en/. Accessed May 15, 2015.

3. http://www.apa.org/pi/ses/resources/publications/homelessness-health.aspx. Accessed May 15, 2015.

4. Thakarar, K., Morgan, J.R., Gaeta, J.M., Hohl, C., Drainoni, M.L. Predictors of Frequent Emergency Room Visits Among a Homeless Population. PLOS One. 2015 Apr 23;10(4)

5. Alang, S.M. Sociodemographic Disparities Associated with Perceived Causes of Unmet Need for Mental Health Care. Psychiatric Rehabilitation Journal. 2015 February 9

6. Richard-Lepouriel, H., Weber, K., Baertschi, M., DiGiorgio, S., Sarasin, F., Canuto, A. Predictors of Recurrent Use of Psychiatric Emergency Services. Psychiatric Services 2015 May 1;66(5):521-6

7. Knowlton A1, Weir BW, Hughes BS, Southerland RJ, Schultz CW, Sarpatwari R, Wissow L, Links J, Fields J, McWilliams J, Gaasch W. Patient demographic and health factors associated with frequent use of emergency medical services in a midsized city. Academic Emergency Medicine, 2013 Nov; 20(11): 1101-11.

8. http://quickfacts.census.gov/qfd/states/53/53033.html. Accessed March 21, 2015.

9. King County Community Health Needs Assessment 2015/2016. 7

10. Health of King County 2006, Chapter 10: Mental Health/Drug Abuse, 4-5

11. Public Health-Seattle and King County, Division of Emergency Medical Services. 2014 Annual Report to the King County Council. 10, 30-31

12. http://www.nwcphp.org/communications/news/delivering-quality-emergency-services-to-vulnerable-populations. Accessed April 25, 2015.

13. http://quickfacts.census.gov/qfd/states/53/5363960.html. Accessed March 21, 2015.

14. https://www.nami.org/Learn-More/Mental-Health-Conditions. Accessed May 15, 2015.

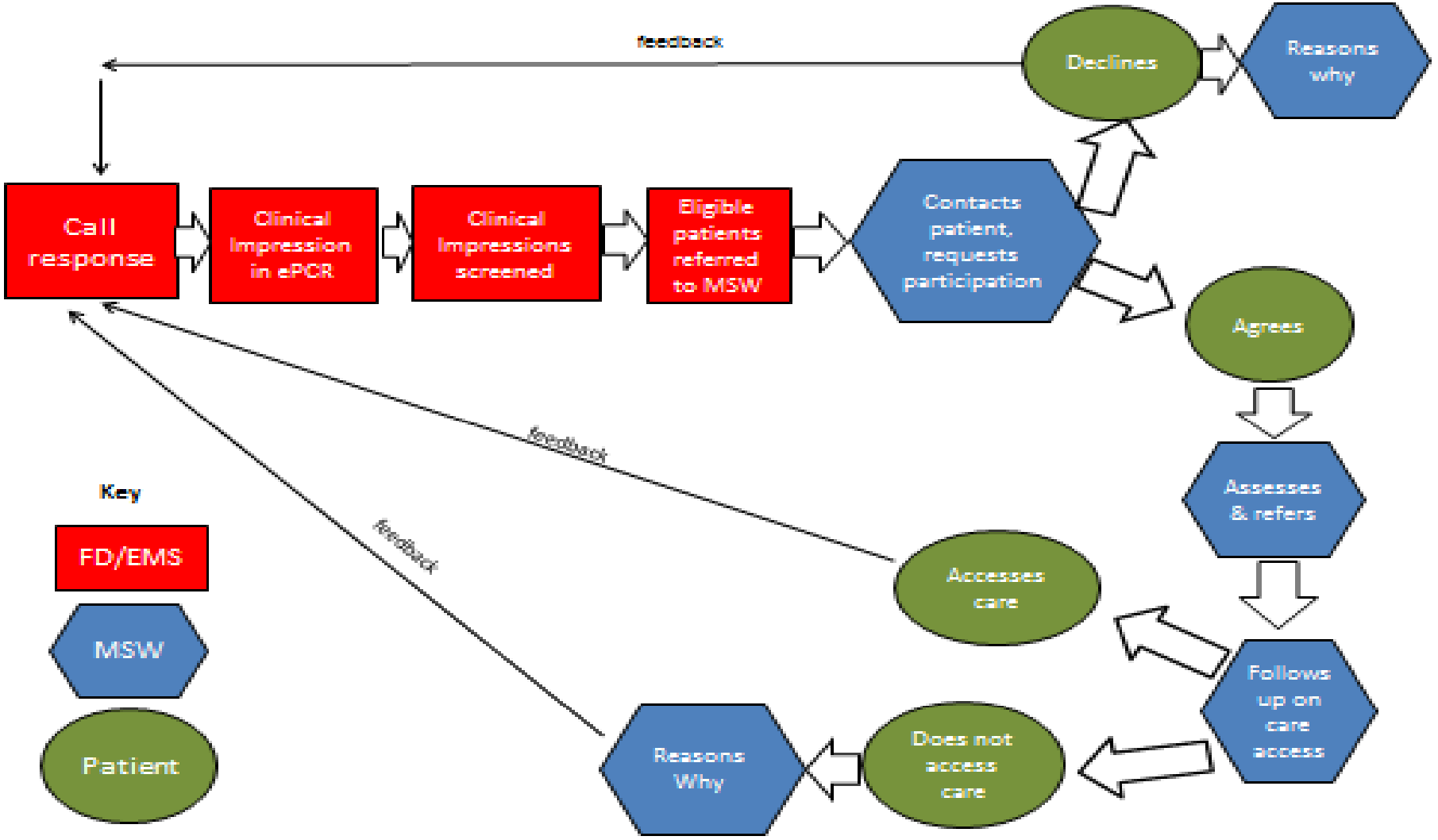
15. http://www.cdc.gov/mentalhealth/basics/mental-illness.htm. Accessed May 15, 2015.

16. http://www.who.int/topics/substance_abuse/en/. Accessed May 27, 2015.

17. Andreas, JB, Lauritzen, G, Nordfjaern, T. Co-occurrence between mental distress and poly-drug use: A ten year prospective study of patients from substance abuse treatment. Addictive Behaviors, Volume 48, September 2015, 71-78

18. http://www.samhsa.gov/data/sites/default/files/NSDUHMetroBriefReports/NSDUHMetroBriefReports/NSDUH-Metro-Seattle.pdf. Accessed May 27, 2015.

Appendix A – Pilot Work Flow Diagram



Appendix B – Pilot Project Database

Pt. No.	ePCR Clinical Impression (Mental Illness, Substance Abuse, Both)	Last Name	First Name	Street Address

City	ZIP	Phone	Gender Male or Female	Race/ Ethnicity Caucasian, Black, Asian, Hispanic, Mixed	Insurance Yes/No	EMS Referral (date)	Contacted? (Yes/No)	Contact Date	Contact Method (In-person or Phone)

Appendix B – Pilot Project Database, continued

Agree to Participate? (Yes or No)	If No, Reason(s) (Services not indicated, Already receiving services, Process not clear or too complex, Other)	If Yes, Reason(s) (Desire to obtain services, Insistence of social support network, Other)	Enrolled in Any Services Now? (Yes or No)

If Yes, Which Services?	Current Case Manager/Phone (if any)	Current Care Provider(s)/Phone (if any)	Service Referral (Yes or No)

Appendix B – Pilot Project Database, continued

Referred to (agency type or provider name)	**Services Accessed?** (Yes or No)	**Access date**	**If Accessed, Reason(s)** (Desire to obtain help, Wish to follow MSW guidance, No barriers, Other)

If Not Accessed, Reason(s) (Process too complex or not understood, No services needed, Desires use of different agency/provider, Outcome unknown/too soon to assess, Case closed, Other)	**Assigned Case Manager/Phone**	**9-1-1 Calls Since Start (number)**	**9-1-1 Calls Prior to Start (number)**