Evaluation of a Vulnerable Population Strategic Initiative:

Patients with Mental Health Illnesses and/or Chemical Dependency Disorders

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May 3, 2017

INTRODUCTION

Background

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

Those who have mental illness or substance use disorder live in our community, often with few resources, alone or with others who are unable or unwilling to provide adequate support. When people with mental illness or substance use disorder or others 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 and/or mental illness 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 use disorder 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. About 30% are non-white, 26% use a language other than English at home,[8] almost 38% have incomes at or near the poverty level, and almost 9% of those under age 65 have no health insurance. In King County, mental illness is the 3rd and 4th leading

cause of hospitalization for females and males, respectively.[2] 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 low-income households and for Hispanics, blacks and those of multiple races.[2] According to members of the King County collaborative, "Hospitals for a Healthier Community," a key issue related to behavioral health is access to care. Members of vulnerable populations have difficulty accessing care and require a high level of social service engagement.[2,3] Those affected by disparities often contact emergency medical services for health care services in disproportionate numbers since no other means are available.[4]

Shoreline, an area within King County, has a population of about 55,000 with diversities and health disparities mirroring the County.[8] The Shoreline Fire Department/EMS has expressed concern that they frequently respond to 9-1-1 calls from those who have mental illness or substance use disorder without an adequate ability to connect them to appropriate health care resources (M. Plorde, Personal Communication, December 5, 2014). Continuing their participation in Vulnerable Populations Strategic Initiatives (VPSI), the Shoreline Fire Department and the County initiated the pilot project to further investigate and address the problem.

Purpose of the Pilot Project

The pilot project was implemented by the Shoreline Fire Department (FD) to test a method of connecting 9-1-1 callers who have mental illness or substance use disorder to health care resources. The project aimed to answer the following questions:

1) Could the problem of use of EMS services by patients with mental health and/or substance use disorder for non-emergencies be further quantified for better understanding and remediation?
2) Could the use of a dedicated social worker (MSW) be effective in connecting and referring community members identified by EMS providers with mental illness and/or substance use disorder?
3) Would patients identified by the MSW agree to assistance?

Pilot Work Flow

Using VPSI funds, the EMS Division contracted with the Center for Human Services (CHS) to employ a MSW to provide dedicated follow-up with every patient identified by the Shoreline Fire Department with mental illness or substance use disorder and refer those in need to appropriate care. The proposed work flow is described in the following diagram.

Figure 1. Pilot Work Flow Diagram
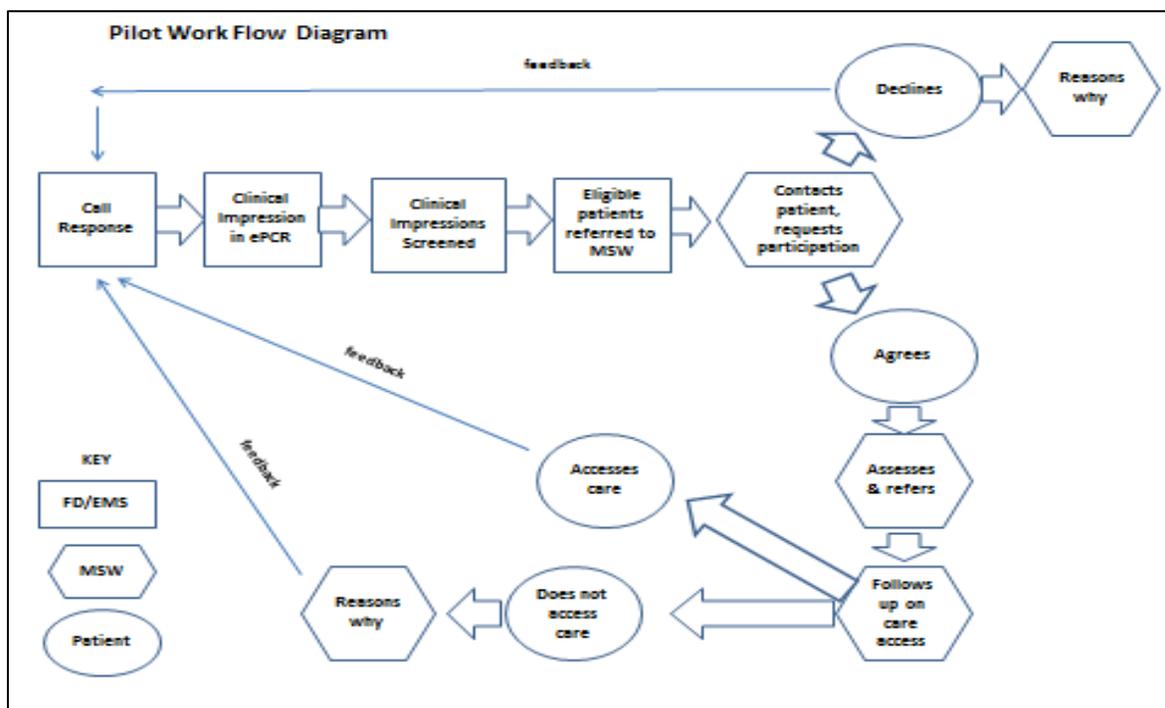
The criterion for inclusion in the pilot was a primary or secondary clinical impression of behavioral/ psychiatric disorder or substance/drug abuse reported by Shoreline FD in the ESO electronic patient care record database where all 9-1-1 responses are documented. Two Shoreline FD workers screened ESO incident reports 2-3 times weekly to identify those with the target clinical impressions and referred them to the MSW.

Initially, the MSW attempted to make contact with the patient by phone to follow-up on the service call, describe the pilot program, and request participation. Refusals were documented and had no

further follow-up. For those who agreed, the MSW completed an assessment, referred the patient to care services, and coordinated services among existing or new case managers and providers. The MSW provided regular feedback on patient outcomes to FD/EMS workers.

Due to a low rate of reaching patients by phone, adjustments were made to the work flow in an attempt to increase the number of patients reached by the MSW. On November 1, 2015, the pilot began Open Access Day (9-5 PM on Wednesdays and Fridays) to improve access to the MSW. Shoreline FD could either drop patients off directly at CHS, or refer patients to the facility for follow up. Unfortunately, this did not result in any additional patient contacts. In December 2015, CHS also began sending a letter to the patient if there was no response to telephone contact or if a telephone number was unavailable.

In February 2016, a Community Medical Technician (CMT) employed by Shoreline Fire Department, began accompanying the MSW to attempt to meet the referred patients in person in hopes of improving the number of patients successfully reached. Figure 2 reflects the change in work flow.

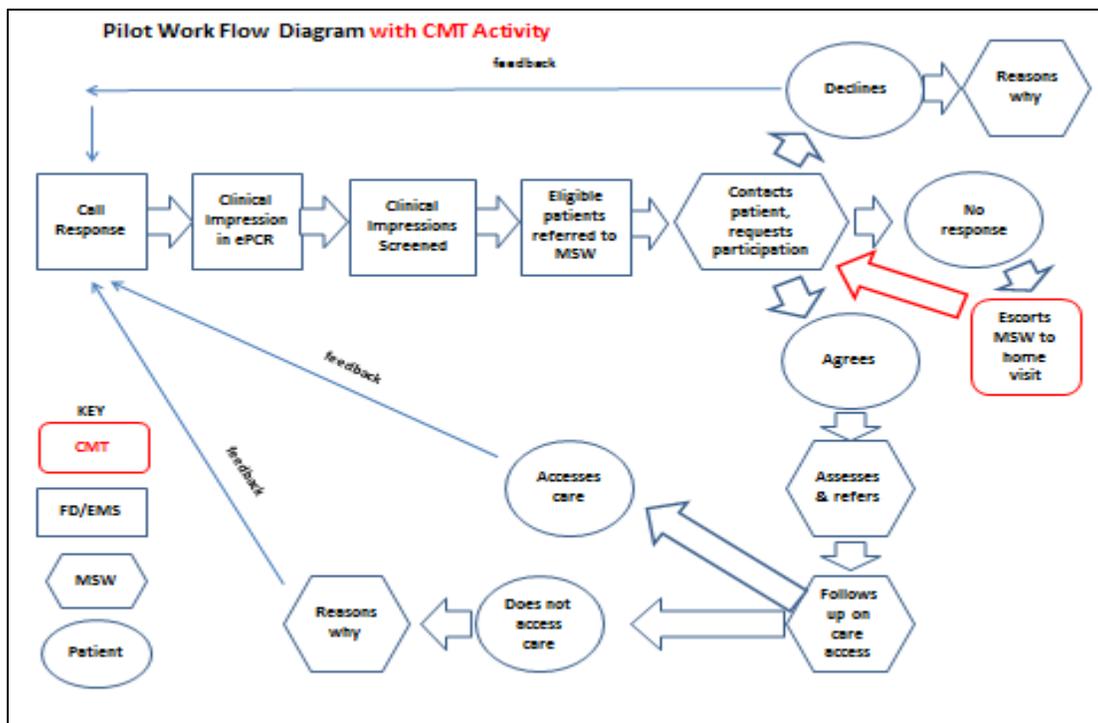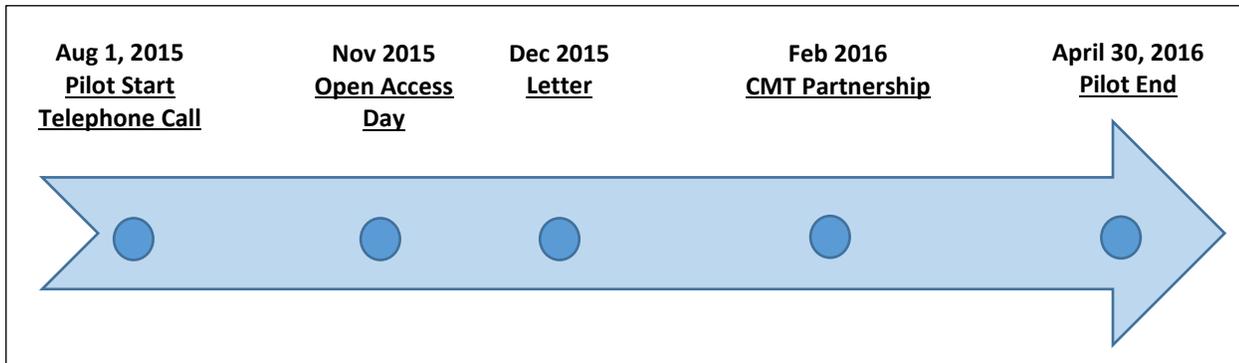**Figure 2. Pilot Work Flow with CMT Activity**

Figure 3 is a timeline that illustrates the initiation of these changes throughout the pilot project.

Figure 3. Contact Tool Use Relative to Pilot Timeline

Aug 1, 2015 Pilot Start Telephone Call	Nov 2015 Open Access Day	Dec 2015 Letter	Feb 2016 CMT Partnership	April 30, 2016 Pilot End

EVALUATION METHODS

The primary objective of the evaluation was to analyze pilot performance with the goal to improve service to vulnerable populations with substance use disorders and mental illness in Shoreline. Evaluation findings will be used by King County leaders and Shoreline FD staff to assess the value of the pilot as well as to inform future service efforts.

Data Analysis

During the design of the pilot project, an Excel database was created to capture patient demographics and outcomes of referrals, logged by the MSW. During the pilot evaluation, the database was analyzed to gain insight into the problem and barriers to care. Within Excel, simple statistics were generated:

- Demographics of referred patients
- Percent of patients who agreed to participate
- Reasons for non-participation
- Comparison of those reached by phone or in person to those who were not reached by the MSW

<u>Team Interviews</u>

Interviews were conducted with crews at 4 fire stations (61, 63, 64 and 65), a Community Medical Technician (CMT), and CHS staff to gain their perspectives on the effect of the pilot on patients and staff, the magnitude of the problem, and the pros and cons of potential solutions. These perspectives are important since potential consequences of the problem include decreased job satisfaction and the development of compassion fatigue, which could impact service quality.

<u>Staff Interviews</u>

Two of the three CHS staff members who served in the MSW role were interviewed to learn about barriers to patient participation, discuss pros and cons of the pilot, and obtain suggestions for improvement.

RESULTS

<u>Data</u>

The pilot ran for 9 months, from August, 2015 through April, 2016. The MSW received 520 substance use disorder/mental health referrals, representing about 10% of the total call volume for Shoreline FD during the 9 month period.

To get a better understanding of characteristics of the patient population that was referred by EMS providers for the pilot program dispatch codes were analyzed. Table 1 shows the Initial Dispatch Codes (IDCs) that were assigned to the 520 calls by the 9-1-1 call receivers based on information they received from the caller. Overdose/Poisoning, Unconscious/Syncopal/Weak, and Behavioral Health IDCs accounted for 55% of all 520 calls. It also shows the number of calls with each IDC that received a paramedic response (paramedic responses are an indication of the severity/critical nature of the call as recognized by the 9-1-1 call receiver). Overdose/Poisoning, Chest Discomfort/Heart Problems, Cardiac Arrest, and Seizures had the highest percentages of calls with a paramedic response.

Table 1. Initial Dispatch Code for 520 MSW Referrals

	Total N (% of 520 calls)	ALS Responses N (% of calls with that IDC)
Overdose/Poisoning	**130 (25)**	**48 (37)**
Unconscious/Syncopal/Weak	**81 (16)**	**17 (21)**
Behavioral Health	**75 (14)**	**11 (15)**
Post-Op/Pain/Bleeding	41 (8)	1 (2)
Chest Discomfort/Heart Problems	39 (8)	15 (38)
Breathing Difficulty	25 (5)	5 (20)
Fire/Haz Mat	24 (5)	1 (4)
Unknown	22 (4)	5 (23)
Assault/Trauma	17 (3)	1 (6)
Stroke (CVA)	14 (3)	2 (14)
Sick (Unknown)/Other	13 (3)	0
Cardiac Arrest	12 (2)	12 (100)
Seizures	11 (2)	4 (36)
Diabetic	5 (1)	1 (20)
Motor Vehicle (MVA)	4 (1)	0
Environmental/Toxic Exposure	2 (0)	0
Bleeding/Pain, Non-trauma	2 (0)	0
Medical Clinic (Facility)	1 (0)	1 (100)
Pediatrics	1 (0)	0
Allergic Reaction	1 (0)	1 (100)
Total	520	125 (24)

Besides the IDC, which indicated the 9-1-1 call receivers' evaluation of the call type, EMS personnel also indicated their assessment of the call type in their primary and secondary impressions in the electronic health records. The primary and secondary clinical impressions documented by EMS personnel provide a more complete picture of the patient findings. Out of 520 incidents, 435 (84%) had

a primary impression of "Behavioral/Psychiatric Disorder" or "Substance/Drug Abuse." An additional 85 (16%) had a secondary clinical impression of "Behavioral/Psychiatric Disorder" or "Substance/Drug Abuse."

Of the 69 unique patients who were reached by the MSW, 17 (25%) only had a secondary impression of "Behavioral/Psychiatric Disorder" or "Substance/Drug Abuse." A chi-square test indicates that there is no correlation between a primary impression of "Behavioral/Psychiatric Disorder" or "Substance/Drug Abuse" and whether the patient agreed to receive services.

Of the 520 incidents involving mental illness or substance use disorder, 364 (or 70%) resulted in transport as described in Table 2. Of these, 85% were transported to a hospital, a comparatively high rate of EMS and hospital resource utilization and corresponding cost, though the latter data were not captured for the purpose of this pilot.

Table 2. Transport Unit and Destination of the 364 Transported Patients

	N (%)
Transport Unit	
BLS	250 (48)
ALS	89 (17)
Other	25 (5)
Transport Destination	
Hospital	311 (85)
ER facility	1 (0)
Other	31 (9)
Unknown	21 (6)

Of the 520 referrals to the MSW, 448 unique patients were identified. Of the 448 unique patients referred to the MSW, 53 (12%) were excluded because they were already in facilities that provide services, 326 (73%) were not reached by the MSW, and 69 (15%) were successfully reached by the MSW. Table 3 describes the patients who were reached by the MSW.

Table 3. Description of 69 Unique Patients Reached Over the Entire Pilot Period by the MSW

	N (%)
Contact Method	
In person	4 (6)
Phone	62 (90)
Unknown	3 (4)
Insurance	
No	61 (88)
Yes	8 (11)
Currently enrolled in any services	
No	31 (45)
Yes	38 (55)
Agreed to receive services	
No	52 (75)
Yes	17 (25)
Referred to services	
No	58 (84)
Yes	11 (16)

Seventeen patients who were reached by the MSW agreed to receive services; 10 of the 17 were already enrolled in other services when they were reached by the MSW. Also notable are the high rate of uninsured patients (88%) and the lack of enrollment in services (45%). Almost all of the 38 patients who said that they were currently enrolled in services mentioned that they were under the care of a primary care physician. Many (45%) mentioned a psychiatrist or mental health counselor. One person had weekly nurse visits and a caregiver.

Of the 52 patients who refused to participate in the pilot, most did not provide a reason for not participating. One patient cited confidentiality, another passed away, and others mentioned they were receiving services elsewhere.

Table 4 below shows that even though only 4 people were reached in person, all 4 agreed to receive services. In-person contacts yield the highest rate of agreeing to receive services.

Table 4. Rate of Agreeing to Receive Services by Contact Method

		Contact Method		
		By Phone, n (%)	In Person, n (%)	Unknown, n (%)
Agree to Receive Services	No	51 (82)	0	1 (33)
	Yes	11 (18)	4 (100)	2 (67)
Total, n		62	4	3

Table 5 presents another interesting finding on enrollment and referral to services of the 69 unique patients reached by the MSW. It shows that 5 patients who were not already enrolled in services were referred to new services. In addition, 6 patients who were already enrolled in services, such as a primary care physician's care, were referred to new services, which were not a part of their routine care.

Table 5. Distribution of Patients Currently Enrolled in Services and Referral to New Services by MSW

		Referred to Services		Total, n
		No, n (%)	Yes, n (%)	
Currently Enrolled in Services	No	26 (84)	5 (16)	31
	Yes	32 (84)	6 (16)	38

Table 6 compares characteristics of patients who were successfully reached by the MSW to those who were not reached.

Table 6. Comparison of Patients Reached and Not Reached by the MSW

	Patients reached by MSW, (N =69)	Patients not reached by MSW (N=380)
Gender, n (%)		
Male	33 (48)	215 (57)
Female	36 (52)	164 (43)
Unknown	0 (0)	1 (0)
Race, n (%)		
Asian	1 (1)	2 (1)
Black	3 (4)	14 (4)
Caucasian	34 (49)	84 (22)
Hispanic	1 (1)	0 (0)
Mixed	1 (1)	0 (0)
Unknown	29 (42)	280 (74)
Age, median, mean (S.D.)	46.5, 46.3 (22.2) *n = 66*	44.5, 44.6 (19.0) *n = 356*
Homeless, n (%)		
Yes	3 (4)	39 (10)
No	62 (90)	292 (77)
Unknown	4 (6)	49 (13)
Phone number available, n (%)		
Yes	65 (94)	301 (79)
No	4 (6)	79 (21)

A larger percentage of those reached by the MSW had an available phone number. However, such a difference is expected since the most frequent method of contact was by phone. Further, attempts were made to reach every patient who had a phone, and significantly fewer contact attempts were made by letter or at-home visit.

Homeless patients present an added challenge in that at-home visits and letters are not feasible methods of contact, and most may not have a phone though the pilot did not collect that data.

Most of those reached by the MSW were Caucasian, but race was unknown for most of those not reached as well as for 42% of those who were reached.

Community Medical Technician (CMT) Interview

In a separate but parallel initiative to serve vulnerable populations, the CMT program was launched in October 2015 in the cities of Shoreline, Bothell and Woodinville. Key differences between the pilot project and the CMT program include:

- The target population. While the pilot project targeted those with mental illness and/or substance use disorder, the CMT program targets select individuals within all vulnerable populations. The majority of those served are the elderly and disabled.
- The intervention staff. The pilot project utilized a social worker employed by Community Health Services (CHS), whereas the CMT is employed by the fire department.

The CMT had a positive impact on both contact rates and willingness to receive services. Table 7 shows the rates of reaching patients before and after the CMT began accompanying the MSW for all 448 unique patients. There was a statistically significant difference (p=0.035) in the number of patients reached by the MSW after the CMT began accompanying the MSW to visit the patient.

Table 7. Rates of Reaching Patients Before and After CMT Involvement

	Patient not reached by MSW, N (%)	Patient reached by MSW, N (%)	Total
Pre-CMT	243 (87)	35 (13)	278
Post-CMT	136 (80)	34 (20)	170
Total	379 (85)	69 (15)	448

Table 8 shows that amongst the 69 unique patients reached by the MSW, patients were more likely (p=0.002) to agree to receive services after the CMT began accompanying the MSW to visit the patient.

Table 8. Service Receipt Rates Before and After CMT Involvement

	Patient did not agree to receive services, N (%)	Patient agreed to receive services, N (%)	Total
Pre-CMT	32 (91)	3 (9)	35
Post-CMT	20 (59)	14 (41)	34
Total	52 (75)	17 (25)	69

Fire Department Interviews

Crews at stations 61, 63, 64 and 65 were interviewed. Themes, similar across all crews, and notable comments are summarized below:

- The person assigned to make contact with patients must have the ability to make a connection quickly in order to maximize opportunities for intervention. An engaging personality with marketing skills may be most effective.

- The ability to intervene must be immediate when a patient requests help or else the opportunity is lost. Ideally, there will be the ability to respond around-the-clock with regional staffing in order to provide care for local populations.

- Crews were confused when they received follow-up from the MSW on individual cases, not realizing the significance of the information or its relationship to the pilot.

- To avoid burn-out or indifference, crews tend to "move on" from calls and not dwell on individual patients or their outcomes.

- Bureaucracy is seen as part of the problem in serving those with mental illness and substance use disorders. Patients have to fit into "neat packages" to be eligible to receive care at social service agencies.

MSW Interviews

Similar to the CMT and crew perspectives, the MSWs believe it is crucial that patients be recruited for intervention "in the moment" and not later. The work flow of the pilot is not conducive to rapid patient

contact so the opportunity may be lost. However, those patients who were reached, especially those reached at their homes, were receptive, appreciative, and grateful for the follow-up.

One barrier to making contact by phone may have been time of day. Many patients are working or otherwise occupied during the day when calls were made. It is possible that the rate of reaching patients would increase if calls had been made in the evening after normal working hours.

Some home visits were attended by the MSW, the CMT, and 1 or 2 firemen. A group of several strangers may be intimidating to some patients, which could negatively affect the ability to make a successful contact and to obtain agreement to connect to care. Most people are reticent to discuss their health problems to strangers, even those who appear to have good intent.

DISCUSSION

The pilot program used a social worker to engage with 9-1-1 callers who were referred by EMS providers with a primary or secondary diagnosis of mental illness and/or substance use disorder. It gave us insight into strategies that may prove to be successful, as well as challenging. Overall, an undeniable strength of including the MSW as part of the pilot is the ability to devote all efforts to making in-person contact and identifying community resources and care providers to patients in need of this support. Further, a dedicated MSW can collect consistently defined data about referrals and outcomes that will continuously inform current and new efforts. As a result of this pilot effort, **69 patients were reached by the MSW, 17 of them agreed to receive services, and 11 patients were assessed and referred to resources for follow up.** Unfortunately, it's unknown whether these patients actually flowed up for care.

A breakdown of initial dispatch codes (IDCs) from dispatch and primary and secondary impressions from EMS personnel indicates that the **patients did not have behavioral/psychiatric disorder or substance/drug use disorder incidents in isolation**. In the 125 (24%) of 520 incidents where an ALS unit was also present at the scene, the patients experienced a more critical medical condition (e.g. cardiac arrest, seizure, or chest pain) as evidenced by the distribution of IDCs in Table 1. This indicates the patients seen by the Shoreline FD may have complex physical and behavioral needs, requiring close

collaboration between the FD and local area resources. In addition, these patients may not have been receptive to follow-up from an MSW because they may not relate their critical 9-1-1 incident to any behavioral or substance use disorder. Perhaps, this correlation could be explained to the patients when the MSW engages with them.

We also learned that **the time and method of contact is directly related to the rate of patient participation**. For one, the screening report in ESO worked well to identify the patients of interest for the pilot, as long as data were entered accurately. However, we found that the timing of the contact loop may be too long; i.e., there is a gap of at least several days between initially screening clinical impressions and referral to the MSW and another similar gap between referral to the MSW and the MSW attempting to contact the patient. Unfortunately, we did not capture the length of time it took to contact or reach the patients, so we were unable to evaluate it with data. The screening report should be run and sent to the MSW regularly (daily) to allow the MSW to follow-up with the patient sooner. If patients are reached within a short amount of time after the 9-1-1 incidents, it may improve the rate of connection to appropriate care.

Regarding the contact methods, we learned that an **in-person contact method is the most efficient way to connect with patients and motivate them to enroll in services**. The reasons may be two-fold: many patients don't have a reliable phone or may choose to ignore calls from an unknown number, and it is generally more difficult to disengage in person than to hang up a phone. Furthermore, we found that when the CMTs began to accompany the MSW to in-person patient visits, the percentage of patients reached by the MSW increased with statistical significance. Of the patients who were reached by the MSW, only 9% agreed to receive services before the CMT accompanied the MSW. After the CMT joined the MSW, 41% of patients reached agreed to receive services. These data indicate that the CMT's involvement in the pilot had a statistically significant impact on the rates of patients agreeing to receive services. Since the MSW mentioned in the interview that some patients may have felt reluctant to share medical issues when multiple EMS personnel (an MSW, CMT, and 1-2 fire-fighter/EMTs) accompanied her to the patient's home, it may be worth considering a two-person team for in-home visits.

People usually call 9-1-1 when in need in of EMS help, so they can be more receptive to receiving help in alternate forms as well. As identified by the CMT, crews, and MSWs in their interviews, the ideal state would include 24-hour staffing to allow more "in the moment" contact rather than later. Additionally, during the pilot project, over 20% of those referred to the MSW called 9-1-1 between 11 pm and 7 am. A 24-hour staffing model would allow capture of those incidents as well.

Another challenge that the pilot faced was that homelessness was an impediment for the MSW to contact or reach the patient. Homeless patients made up about 9% of all patients identified in the pilot, but only 3 of the 41 total homeless patients were reached by the MSW. From the data collected, it was not clear if the homeless patients had a phone number. It is possible that reach rates for this population were so low because of a lack of phone and no address to which to address the letter or for in-person visits.

Finally, it is important to address the cultural concerns voiced by the crews in their interviews. In order for a program like this to be a success, a unified field-based team is required. Perhaps, after addressing the challenges the MSW encountered in reaching patients, patient contact and service enrollment rates will increase, convincing EMS providers of the program's benefits and utility. It is imperative to provide immediate feedback on patients to crews, so that they can recall the patients. The MSW can also explain how the EMTs' involvement had an impact on the patient's overall care, elucidating the crucial role that EMTs play in programs like this pilot. Overall, in order to bolster support, all parties leading these efforts can stress that mobile integrated health programs, such as this pilot, aim to reduce low-acuity calls so that crews can be available to engage in other critical activities in their departments and communities.

CONCLUSIONS & RECOMMENDATIONS

After evaluating the "Patients with Mental Health and/or Chemical Dependency" VPSI Pilot Program, we can make the following recommendations:

1. Patient screening by the FD and referral to the MSW should occur regularly (daily) to minimize the gap between referral and MSW follow up.

2. In-person visits are the most effective contact method. This should be done in partnership with local area service providers (MSW) in partnership with CMT.

3. Twenty-four/seven availability by MSWs will allow for more immediate contact "in the moment" could increase engagement with patients.

4. CMTs and MSWs must be able to quickly make an emotional connection with the patient. The "right" personality is a key criterion for success.

5. Real time feedback from the MSW to the crews will make the program more obvious and meaningful to the EMS personnel, than emailed updates weeks or months after the incident.

In conclusion, this pilot program was able to connect with 11 patients and refer them to needed services. This should be perceived as a considerable success in light of the many challenges people face with mental illness and chemical dependency. We were also able to identify areas for improvement in order to increase engagement. A coordinated effort to address the recommendations listed above will lead to greater success for Shoreline FD and the region. An initiative such as this has the potential to positively impact the lives of people with mental illness and/or substance use disorders in King County's communities. Fire departments are in a unique position to come into contact with people in need of services, and ideally, connect them to community resources in a comprehensive and cohesive way.

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