FOSTERING WHOLE PERSON CARE THROUGH A CARE COORDINATION NETWORK: COMMUNITY INFORMATION EXCHANGE SAN DIEGO

EVALUATION REPORT FOR 2-1-1 SAN DIEGO'S SENIOR COHORT

OCTOBER 2017

Presented by:

About 2-1-1 San Diego
The mission of 2-1-1 San Diego is to serve as a nexus to bring the community (organizations) together to help people efficiently access appropriate services, and provide vital data and trend information for proactive community planning.

The Caster Center acknowledges Karis Grounds, Alana Kalinowski, Nicole Blumenfeld, and Minh Tran for their help with this project.

University of San Diego
SCHOOL OF LEADERSHIP
AND EDUCATION SCIENCES

About the Caster Family Center for Nonprofit and Philanthropic Research
The mission of the Caster Center is to provide research, evaluation and consulting services that build the leadership and strategic and evaluative thinking capacity of local nonprofits, and be the leading source of information, data and research on the local nonprofit sector.

Research Team
Mary Jo Schumann, PhD, Director of Research
Tessa Tinkler, PhD, Senior Research Associate
Katherine Nilsen, PhD, Research Associate

Support Team
Kim Hunt, PhD, Research Associate
Meghan Kelly, MPA, Research Assistant
Connelly Meschen, MA, Coordinator

Caster Family Center for Nonprofit and Philanthropic Research
The Nonprofit Institute
School of Leadership and Education Sciences
University of San Diego
www.sandiego.edu/npresearch

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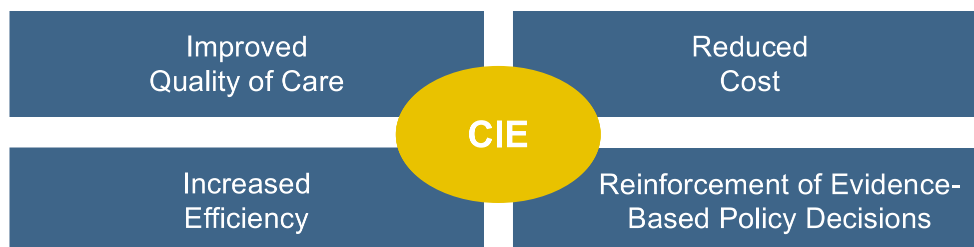
BACKGROUND

In 2012, an innovative group of healthcare and social service leaders combined social determinants of health data with electronic health records (EHRs), ultimately developing the Community Information Exchange (hereafter referred to as CIE) as a care coordination network to facilitate referrals and service delivery to clients in need. 2-1-1 San Diego served as the fiscal agent until CIE incorporated in California in October 2013 as a 501(c)3 nonprofit organization, and engaged partner organizations, customized technology to securely and efficiently exchange information across organizations, and launched its first client-centered dashboards for sharing information across six organizations that served the homeless in downtown San Diego (Cohort 1).[1] In February 2016, CIE became a technology of 2-1-1 San Diego maintaining its own 501(c)3 status.

Using a technology platform where agencies can enter and share client data, CIE strives to foster whole person care for the populations it serves (e.g., homeless, seniors, military), as well as reduce duplicative intakes and services provided by healthcare and social service agencies. By consenting into CIE, clients give permission for data sharing and may receive multiple referrals and services for their healthcare and/or social service needs.

Overall, CIE's enhanced care coordination network has four overarching goals:



OVERVIEW AND METHODOLOGY

2-1-1 San Diego commissioned the University of San Diego's Caster Family Center for Nonprofit and Philanthropic Research (Caster Center) to conduct the CIE Cohort 2 evaluation, which focused on the senior (defined as ages 60+) population in the San Diego region

Based on the aforementioned goals, the evaluation focused on answering the following questions:

- ☑ Who was served by CIE? What was the demographic and geographic profile of senior clients who consented into CIE?
- ☑ How was CIE utilized by participating agencies?
- ☑ Was CIE associated with any positive outcomes for senior clients?
- ☑ What were the advantages and challenges of using CIE for participating agencies' staff?

Focus of Cohort 2:

Seniors ages 60+ in San Diego region

[1] *In 2015, San Diego State University's Institute for Public Health evaluated Cohort 1, which focused on the homeless population.*

A mixed methods approach was used to address the specific evaluation questions and provide evidence that CIE contributes to the goals of a care coordination network. Table 1 summarizes the quantitative and qualitative methodologies, data sources, and participants used for this evaluation.

Table 1. Methodology Summary

Data Source	Participants	Description
CIE Database July 2014-July 2017	Senior Clients	The Caster Center analyzed agency and client information housed in the Efforts to Outcomes (ETO) CIE database, including demographics, agency usage, and EMS transport data.
Key Informant Interviews Dec 2016-Jan 2017 n=3 • *Father Joe's Villages/ St Vincent de Paul* • *Family Health Centers of San Diego (FHCSD)* • *Scripps Mercy Hospital*	Agency Staff and Leadership	Milliman (an independent firm and provider of actuarial and related products and services) conducted interviews with agency staff and leaders for their February 2017 CIE financial sustainability report. While the focus was on sustainability, Milliman's interview guide included questions about participants' expectations and uses of CIE, and barriers to adopting the CIE platform. Therefore, the Caster Center team analyzed Milliman's interview notes for this evaluation.
Agency Participant Interviews June-July 2017 n=5 • *City of San Diego Fire/Rescue* • *ElderHelp* • *Serving Seniors* • *Meals-On-Wheels* • *Catholic Charities*	Agency Staff and Leadership	The Caster Center developed an interview guide for agency participants who provided services for senior clients. Questions included the agency's utilization of CIE, expectations for CIE, and perceived benefits and barriers for senior clients (see Appendix A for the interview guide). 2-1-1 San Diego directors conducted and recorded the interviews, and provided some notes and overall impressions. Interviews ranged from 9-18 minutes each. Notes and audiotapes were analyzed by the Caster Center team.
Discussions with 2-1-1 San Diego Staff June-Sept 2017 n=4 • *Director of Health and Partner Integration* • *Associate Director of Partner Engagement* • *Senior Data Analyst* • *Director of Software Development*	2-1-1 San Diego Staff	This project involved ongoing discussions between the Caster Center team and 2-1-1 San Diego staff who had knowledge of CIE and/or senior-serving agencies. The Caster Center team took meeting notes and used them as part of the evaluation analysis.

QUANTITATIVE FINDINGS: CIE DATABASE

DEMOGRAPHIC AND GEOGRAPHIC PROFILE OF SENIOR CLIENTS

Table 2 summarizes the demographic profile of the 2,900 senior clients who consented into CIE, as well as the demographic profile of seniors in San Diego County. Note the CIE database contains missing data, and therefore caution should be taken when comparing the two groups.

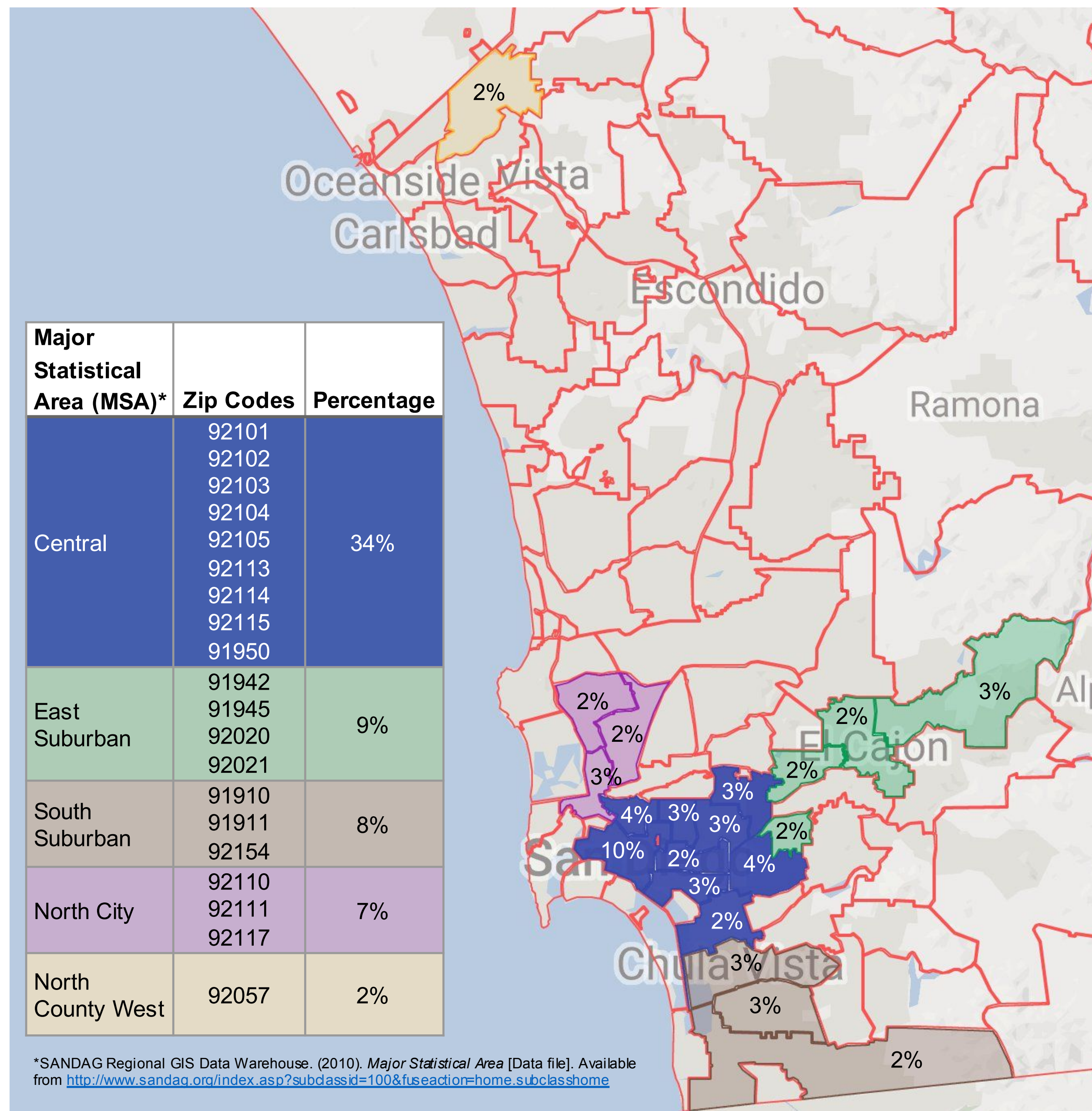
Table 2. Demographic Profile of Senior Clients in CIE and Seniors in San Diego County[2]

Demographic	CIE Enrolled	San Diego County Population
Gender		
Males	46%	44%[a]
Females	37%	56%[a]
Missing data	17%	
Age		
60 to 64 years	46%	30%
65 to 74 years	35%	39%
75 to 84 years	13%	21%
85 years and over	6%	10%
Disability Status		
With a disability	4%	36%[b]
Without a disability	31%	
Missing data	65%	
Housing Status		
Lives alone	14%	35%[c]
Lives with others	3%	
Lives with spouse	1%	
Lives with children	1%	
Missing data	81%	
Insurance Providers		
With health insurance coverage	35%	86%[d]
Without health insurance coverage	1%	
Missing data	64%	
Homeless Status		
Gross Rent as a Percentage of Household Income (GRAPI) of 35%+		47%[e]
Unstable housing[3]	19%	
Don't know/Missing data	81%	

[2] *https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2015/*
[a] *65 years and over.*
[b] *65 years and over, Civilian Noninstitutionalized Population.*
[c] *65 years and over, percentage calculated from the total number of householders living alone.*
[d] *Civilian Noninstitutionalized Population.*
[e] *GRAPI was used as a proxy for unstable housing; it is based on available data for occupied units paying rent.*
[3] *Includes seniors who were homeless, imminently losing housing, or unstably housed and at-risk of losing housing.*

Of the 46% of senior clients with valid zip code data (n=1,348), there were 110 zip codes reported. Figure 1 displays the top 20 zip codes for senior clients organized by Major Statistical Area (MSA). One third (34%) of the senior clients lived in the Central region. The most frequent zip code for senior clients was 92101.

Figure 1. Zip Codes of Seniors by MSA (n=1,348)



Major Statistical Area (MSA)*	Zip Codes	Percentage
Central	92101 92102 92103 92104 92105 92113 92114 92115 91950	34%
East Suburban	91942 91945 92020 92021	9%
South Suburban	91910 91911 92154	8%
North City	92110 92111 92117	7%
North County West	92057	2%

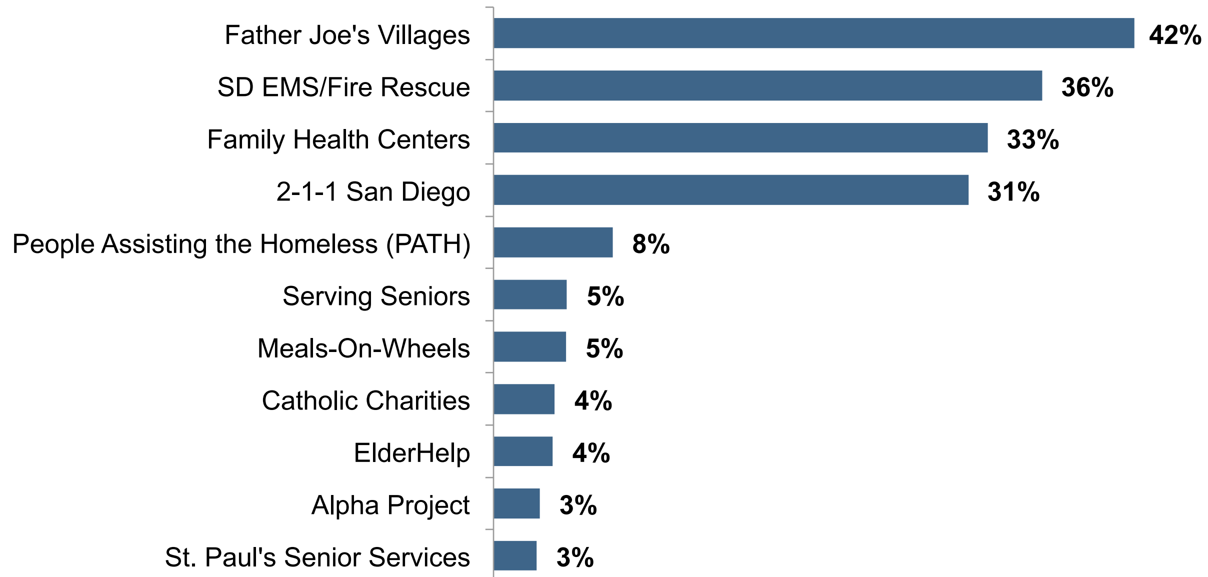
*SANDAG Regional GIS Data Warehouse. (2010). *Major Statistical Area* [Data file]. Available from http://www.sandag.org/index.asp?subclassid=100&fuseaction=home.subclasshome

ANALYSIS OF CIE USAGE

Client Enrollment in CIE Agencies

Figure 2 shows the percentage of senior clients enrolled in each of the participating CIE agencies. Nearly one-half (42%) of senior clients were enrolled in Father Joe's Villages, and 17 percent were enrolled in one of the senior-serving agencies (Serving Seniors, Meals-On-Wheels, ElderHelp, and St. Paul's Senior Services). Because of CIE, all of these agencies were able to access information about clients that they would not have had access to otherwise.

Figure 2. Client Enrollment in CIE Agencies (n=2,900)*

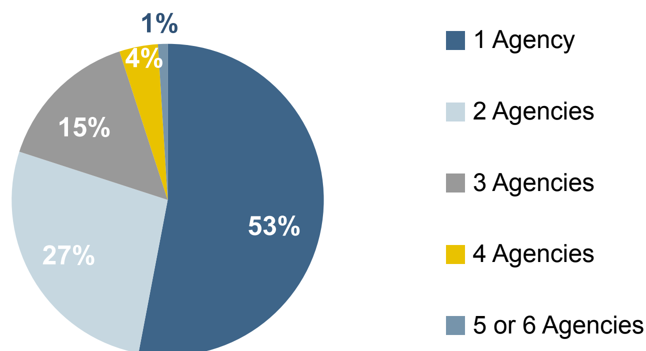


**Percentages do not total 100% because clients were enrolled in multiple agencies*

Number of Agency Enrollments Per Senior

Figure 3 shows that one-half (47%) of senior clients were enrolled in two or more agencies, where their information could be shared amongst those overlapping agencies.

Figure 3. Number of Agency Enrollments Per Senior (n=2,900)



Senior Client Lookups

A "lookup" refers to when an agency views a client's information in the CIE database, and therefore signifies instances in which agencies use CIE to access shared client information and potentially coordinate care. As shown below, a total of 73 senior clients were looked up by two or more agencies.

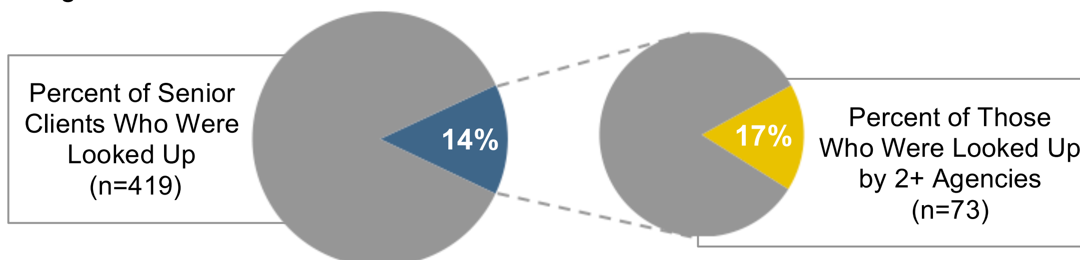


Table 3 shows that Father Joe's Villages and SD EMS/Fire Rescue had the highest total client lookups and unique client lookups. Both agencies' data systems are directly uploaded into the CIE database, in contrast to the other agencies that have to take an extra step and send their data to 2-1-1 San Diego to be imported into the CIE database. This may contribute to when and how often agencies utilize CIE.

On average, senior clients were looked up 2.2 times per agency. Father Joe's Villages, ElderHelp, Family Health Centers, and San Diego EMS/Fire Rescue had the highest average lookups per client. Of the senior-serving agencies, ElderHelp looked up senior clients most frequently.

Table 3. Senior Client Lookups By Agency

Agency	Total Client Lookups	Unique Client Lookups	Average Lookups per Client	Range of Client Lookups
Father Joe's Villages	654	262	2.5	1 to 26
SD EMS/Fire Rescue	168	78	2.2	1 to 26
People Assisting the Homeless (PATH)	76	44	1.7	1 to 8
ElderHelp	75	33	2.3	1 to 12
Family Health Centers	42	18	2.3	1 to 11
Meals-On-Wheels	33	20	1.7	1 to 3
Serving Seniors	19	12	1.6	1 to 4
Alpha Project	14	12	1.2	1 to 2
2-1-1 San Diego	11	6	1.8	1 to 5
St. Paul's Senior Services	11	9	1.2	1 to 2
Scripps Mercy Hospital	9	6	1.5	1 to 2
Catholic Charities	8	7	1.1	1 to 2
UCSD Medical Center	7	7	1.0	1 to 1
Total	**1,127**	**514**	**2.2**	**1 to 26**

Figure 4 shows that senior clients who were enrolled in multiple agencies were looked up three times more frequently than senior clients enrolled in only one agency.

Figure 4: Percent of Senior Clients Who Were Looked Up (n=419)

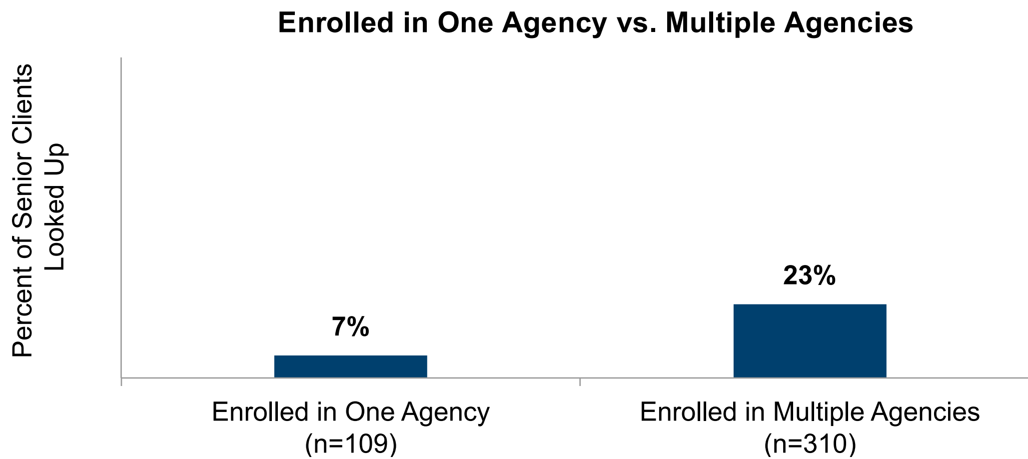
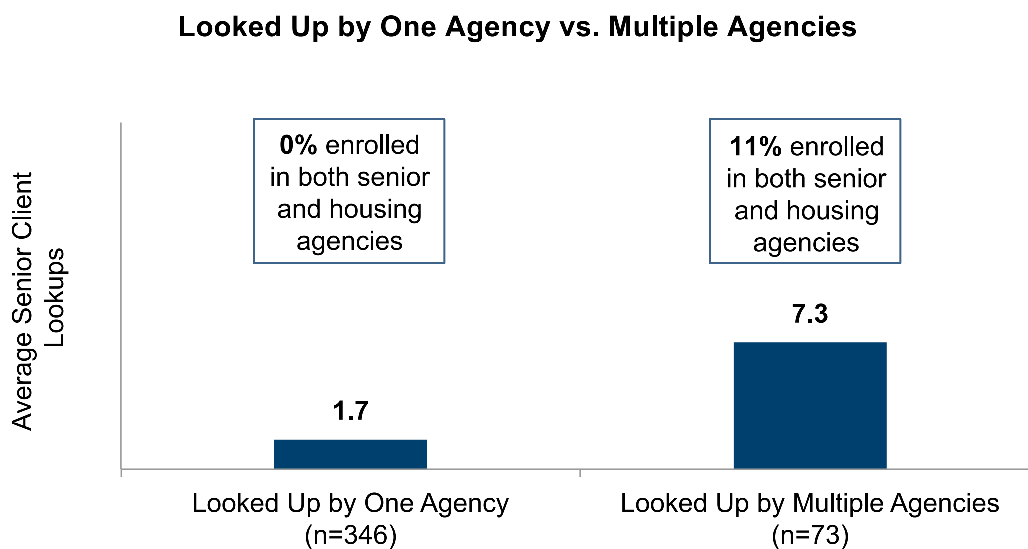


Figure 5 illustrates that senior clients who were looked up by multiple agencies had more than four times the average number of lookups than senior clients looked up by only one agency. Moreover, one out of ten senior clients (11%) who were looked up by multiple agencies were enrolled in both senior-serving and housing agencies. In contrast, no senior clients who were looked up by one agency were enrolled in both senior and housing agencies.

Figure 5: Average Senior Client Lookups and Types of Agency Enrollments (n=419)



The co-occurrence of both senior and housing agency enrollments for seniors who were looked up by multiple agencies points to the benefits of care coordination to address multiple needs and whole person care

ANALYSIS OF OUTCOMES ASSOCIATED WITH CIE

In order to assess ways in which CIE was positively impacting senior clients and the overarching goals, the Caster Center team analyzed EMS transport data. EMS transports were selected for the following reasons:

- Seniors who are frequently transported to the Emergency Room (ER) represent a population with significant social service and healthcare needs
- The Cohort 1 analysis of homeless clients also analyzed EMS transports, making comparisons between cohorts possible
- In the CIE database, EMS transports had the most data points of all potential senior client outcomes

EMS Transports

Table 4 shows the number and percentage of EMS transports during the 12 months prior to enrolling in CIE. The majority of senior clients (82%) did not have an EMS transport. Using the same terminology from the Cohort 1 evaluation of homeless clients, senior clients who did have an EMS transport were categorized into General, Frequent, and Super EMS user groups.[4]

18% of senior clients had a history of EMS transports before enrolling in CIE

Table 4. History of EMS Transports 12 Months Before CIE Enrollment

Annual EMS Transports	Number	Percentage
No EMS Transports	2,380	82%
General (1-2 Transports)	371	13%
Frequent (3-11 Transports)	126	4%
Super (12+ Transports)	23	1%
Total CIE Senior Clients	**2,900**	**100%**

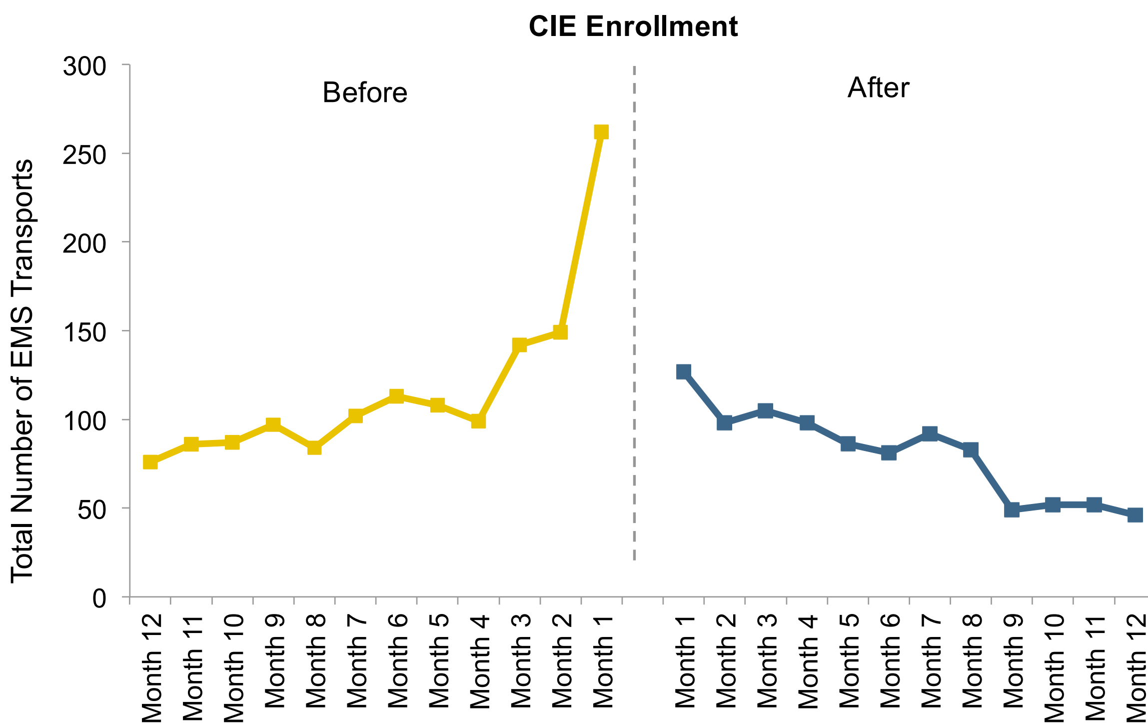
[4] *The range of EMS transports for the senior cohort was much smaller than the range of EMS transports for the homeless cohort; therefore, the individual ranges of transports for each of these EMS user groups was adjusted for Cohort 2.*

Was CIE enrollment associated with a reduction in the number of EMS transports?

Figure 6 displays the total number of EMS transports for the 12 months leading up to seniors' enrollment in CIE and the 12 months following their enrollment.[5] In general, there was a steady climb in the total number of EMS transports prior to CIE enrollment, with a sharp spike one month before enrollment. After CIE enrollment, the total EMS transports sharply decreased and gradually declined over time.

CIE enrollment was associated with a reduction in EMS transports

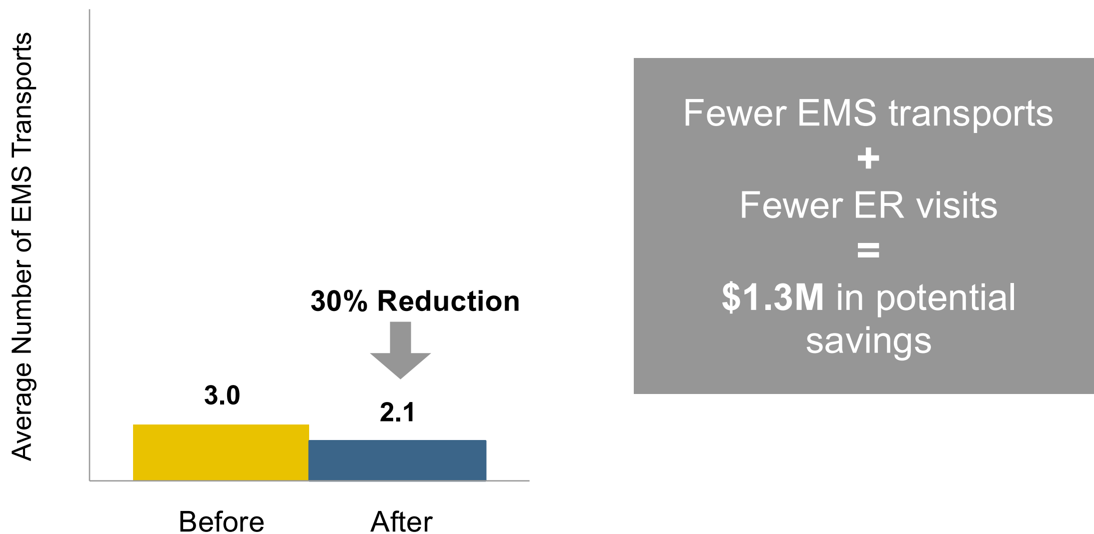
Figure 6. Total Number of EMS Transports in the 12 Months Before and After CIE Enrollment (n=464)



[5] *This sample of 464 seniors represents a smaller subset of the senior clients because they had a history of EMS transports in the 12 months before CIE enrollment and had been enrolled in CIE for at least six months (to be consistent with Cohort 1).*

Figure 7 presents the average number of EMS transports before and after CIE enrollment.[6] The average number of EMS transports decreased from 3.0 transports prior to CIE enrollment to 2.1 transports following CIE enrollment. This 30% reduction in transports among CIE senior clients translates to a potential cost savings of $777,571 for San Diego County.[7] The reduction in EMS transports also means a reduction in ER visits, which translates to an additional cost savings of $514,901.[8]

Figure 7. Average Number of EMS Transports Before and After CIE Enrollment (n=464)*

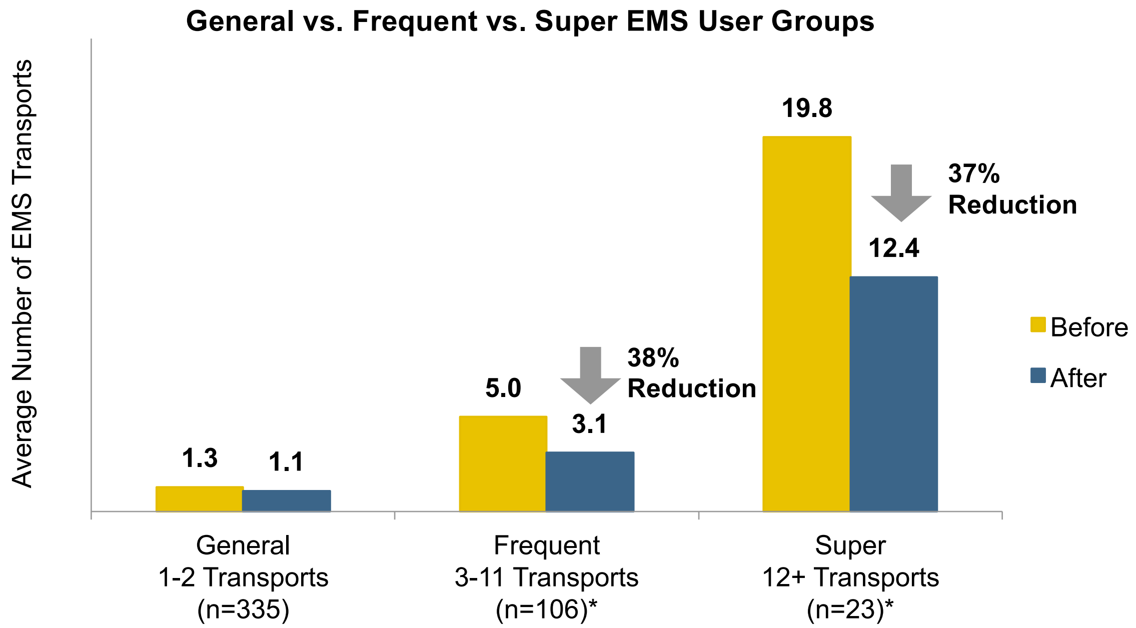


Statistically significant difference (p<.05)

[6] *A paired-sample t-test was performed to identify statistically significant differences between average number of EMS transports before and after CIE enrollment.*
[7] *The average cost of an EMS transport in San Diego was $1,862. This was determined by taking an average of cost estimates from the following sources:*
Estimate 1: $1,800 http://www.amr-sandiego.com/index.php?pid=51
Estimate 2: $1,820 http://www.kpbs.org/news/2013/jun/04/sd-ambulance-contract/ and http://www.voiceofsandiego.org/business/what-san-diegos-ambulance-contract-is-worth/
Estimate 3: $1,966 http://www.sdcta.org/assets/files/City%20of%20SD%20EMS%20Insourcing%2010-28-13%20SK.pdf
[8] *The cost of an emergency room visit was $1,233 https://doi.org/10.1371/journal.pone.0055491*

Figure 8 shows the average EMS transports for the General, Frequent, and Super EMS user groups before and after CIE enrollment.[9] While all groups experienced a reduction in the average number of EMS transports, the Frequent and Super EMS user groups experienced the largest reductions.

Figure 8. Average Number of EMS Transports Before and After CIE Enrollment (n=464)



**Statistically significant difference (p<.05)*

[9] Paired-sample t-tests were performed to identify statistically significant differences between average number of EMS transports before and after CIE enrollment for each of the three EMS user groups.

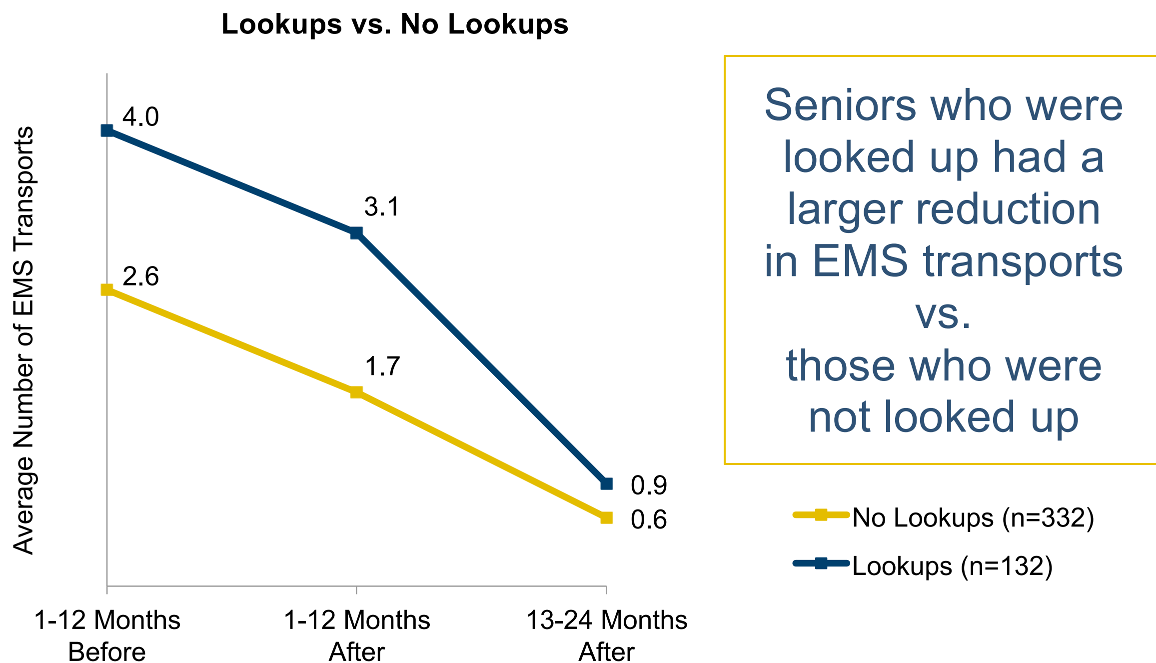
Were senior client lookups associated with a reduction in EMS transports over time?

In order to further understand the potential relationship between EMS transports and CIE, average EMS transports were compared for senior clients who were looked up and those who were not looked up across three time periods:[10]

Figure 9 shows that senior clients who were looked up had more EMS transports than senior clients who were not looked up across all three time periods. This is logical because those who had more EMS transports likely had greater needs, which should have prompted agencies to look them up.

Furthermore, there was a significantly larger reduction in average EMS transports for senior clients who were looked up compared to those who were not looked up. This suggests that senior clients who were looked up may have received more support from CIE participating agencies because their EMS transports declined more drastically over time compared to senior clients without lookups.

Figure 9: Average Number of EMS Transports Over Time (n=464)*



**Statistically significant difference (p<.05)*

Analyses were also conducted to determine if lookups followed an EMS transport, however there was no clear correlation. That is, there were many EMS transports with no subsequent lookups, and there were many lookups that did not follow an EMS transport.

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[10] *A repeated measures ANOVA (Analysis of Variance) was performed to test for statistically significant differences between means across the three time periods.*

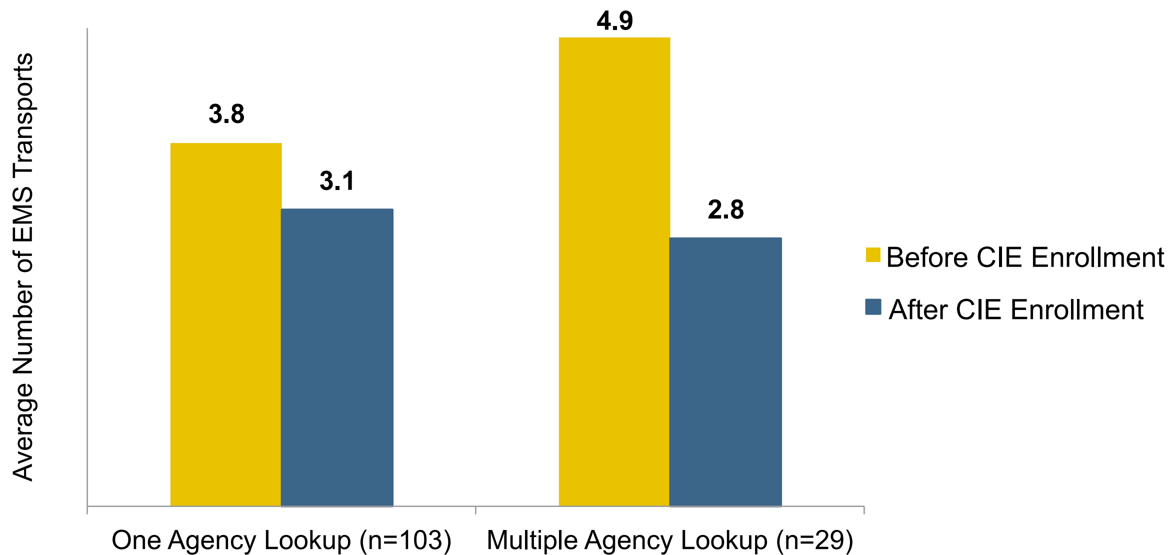
Was there a difference in the number of EMS transports for senior clients looked up by multiple agencies vs. one agency?

Figure 10 illustrates that senior clients who were looked up by multiple agencies had more EMS transports (average=4.9) before CIE enrollment than senior clients who were looked up by one agency (average=3.8). Yet, 12 months after enrolling in CIE, the senior clients who were looked up by multiple agencies had a lower average number of EMS transports (average=2.8) compared to senior clients only looked up by one agency (average=3.1). This result suggests that CIE's network (i.e., multiple touch points from different agencies) is associated with a reduction in EMS transports.

Multiple agencies looking up clients is associated with a reduction in EMS transports

Figure 10. Average EMS Transports Before and After CIE Enrollment (n=132)*

Lookups by Multiple Agencies vs. One Agency



**Not statistically significant (p=.13)*

COMPARISON TO COHORT 1 FINDINGS

Overall, the findings for the senior population in Cohort 2 were consistent with the findings for the homeless population in Cohort 1, although it is important to note that the two groups were not mutually exclusive because many of the senior clients were also homeless.

Compared to homeless clients, senior clients had similar numbers of EMS transports before and after CIE enrollment. Analyses for Cohort 2 included a longer timeframe than Cohort 1, and the pattern of a large spike in EMS transports one month before CIE enrollment and then reduced EMS transports after CIE enrollment continued.

Even with the longer timeframe, the numbers of EMS transports for the senior General, Frequent, and Super EMS user groups were less than the numbers for the homeless cohort, suggesting that senior clients may have had less immediate emergency health needs, less risky health behaviors that required quick treatment, and/or did not seek out emergency transport services.

Like the homeless cohort's Super EMS user group, there was a statistically significant decrease in the average number of EMS transports after CIE enrollment for the senior cohort's Super EMS user group. For senior clients, the difference was also statistically significant for the Frequent EMS user group, indicating that CIE enrollment was beneficial for senior clients using EMS transport less frequently (i.e., 3-11 times per year).

The average number of lookups by agency was consistent for both the senior and homeless cohorts at around two lookups, although it was slightly higher for senior clients (2.2) compared to homeless clients (1.8). This may be because the Cohort 2 analysis spanned a longer timeframe.

The similar EMS outcome data findings suggest that there may be health and cost-saving benefits related to CIE enrollment for both the homeless and senior populations, as indicated by fewer EMS transports after CIE enrollment. Furthermore, the similar average lookup data results point to the possible occurrence of care coordination within and across agencies for both cohorts.

CAVEATS AND LIMITATIONS OF CIE DATABASE

There were a variety of challenges with using the CIE database to answer the evaluation questions, and the findings should be interpreted in light of these limitations.

First, there were multiple data integrity issues, including:

- A lack of standardized data entry (i.e., some agencies directly linked their information into the CIE database, whereas other agencies sent information from their case management systems to be imported into the CIE database) which yielded inconsistent and incomplete client records
- Uncertainty about variable names and what they represented (e.g., date created and date consented)
- Duplicate records and/or multiple records per client because of multiple IDs and/or misspelled or multiple names (e.g., Katherine versus Kathy)
- Inconsistencies in different records for the same individual (e.g., identified as both male and female, or as both having and not having a disability)
- Extensive missing and "null" data

Second, data represented a 3-year time period where senior clients entered the system at different times. Therefore, the findings do not represent the same moment in time or the present time (e.g., age and zip code may not be current).

Third, it is important to understand and acknowledge that the findings reflect an association between CIE and positive outcomes and not causation. For example, it should not be concluded that fewer EMS transports were the direct result of CIE because there could be other reasons and contributing factors.

QUALITATIVE FINDINGS: PERSPECTIVES FROM AGENCIES

It is important to note that the subsequent findings include consistent and logical themes that reflect participants' experiences and opinions, but do not necessarily represent 100% consensus of the participants' perceptions. Moreover, the type of agency (e.g., social service, healthcare, government) was a mediating factor that impacted perceptions, experiences, utilization, and recommendations. In other words, the different needs of different agencies contributed to the number and variety of challenges, as well as the various recommendations for improvement.

It should also be noted that the findings reflect perceptions of participants who provide services to the senior population and not the senior clients themselves. Therefore, these findings may not reflect senior clients' true needs, or represent the impact that CIE had on senior clients and the overarching goals. In addition, the sample size is limited and not necessarily representative of, or generalizable to, the larger network of agencies and staff.

STRENGTHS OF CIE

Overall, participants had positive perceptions of CIE's philosophy and goals, which are summarized below.

Strength of Concept

Participants liked the philosophy of CIE from both a workflow standpoint (e.g., reducing intake redundancies, accessing and verifying client information) and a care coordination standpoint (e.g., higher quality of care, more supports for clients).

I think we stuck with it because we believe in the concept…
[we are] excited about 211 and new momentum.

Excitement for 360° Community Coordination (360)[11]

Participants were enthusiastic about 360 because the new direct referral pathway will fulfill the objectives of CIE and increase the likelihood of collecting and sharing more client data.

[Our agency is] particularly excited about 360
because the direct referrals will essentially deliver
the philosophical ideals of CIE with each client coming in
rather than just hoping there will be information on a client.

Benefits for Seniors

Participants believed that information sharing had the potential to help them and partnering agencies address senior client needs. They felt that data sharing allowed information about client impairments or barriers to be known to all agencies working with a particular client, which was especially important when a client's impairments (e.g., dementia) may have led them him/her to share information with one agency but not another.

[11] *360° Community Coordination is 2-1-1 San Diego's new technology platform where agencies can access shared client records and receive direct, facilitated referrals. 2-1-1 San Diego serves as the hub through which clients are processed by intake specialists and then referred to services that they need. Part of the intake process involves a holistic assessment of client needs according to social determinants of health.* *http://211sandiego.org/community-coordination/*

The majority of our [senior] clients are homebound.
The more we can work with other agencies to coordinate their care,
the more they are going to benefit.

They [senior clients] are walking to our different centers and our different locations…Just being able to have a better glimpse of them… and what their needs are [helps us help them].

Maybe [senior clients] are not telling us everything.
Maybe there's some dementia so maybe some [agencies] are getting information that we're not.

CHALLENGES WITH CIE

Participants reported some challenges with the CIE technology platform, and the ability for senior clients to enroll and take full advantage of CIE referrals and services. These challenges are summarized below.

Functionality of the CIE Platform

Participants revealed challenges with CIE's technology platform and interface glitches, which discouraged users from utilizing the system. These included:

- Not very user-friendly (e.g., platform not intuitive, tabs contain missing information, difficult to find valuable information)
- Status bar error messages
- Credentials that worked only on occasion
- Navigation stuck on a page
- Timeliness of alerts

Lack of Data Sharing

Not all agencies entered data or clients into CIE because they did not have the time, were not motivated, and/or were reluctant to adopt the system because of CIE's limited scale.

Some agencies shared data with CIE; however, when they logged in, they sometimes could not find clients and/or did not have access to new client data from other agencies.

CIE's data is extracted from our HMIS and imported into the CIE.
So whatever we put in is what they have for the client.

…the information from [the] dashboard was the information from [our agency]. So really [CIE] was an extra step for our team without a lot of benefit.

Potential for Misuse

Participants expressed concerns about multiple case managers assigned to clients from different agencies and the need to prevent client workarounds.

We have someone assigned to [our agency] but he is using the VA for serious medical conditions and care management. So we get dinged since he doesn't have a full medical assessment. But he doesn't use us for that and really the VA is his primary medical home…

…we have a Medi-Medi patient [Dual Eligible] who broke his opioid medical agreement. He was caught shopping around. Then he walked out and called 9-1-1 because then the EMS can pick him up and give him pain meds. So that's an example of a way we can better prevent opioid abuse and share information…

Senior Clients' Reluctance to Share Personal Information

Participants explained that senior clients, in particular, are reluctant to consent into CIE because they do not like sharing their personal information.

For older adult populations, [there are] misconceptions and fear about how information is being stored and out there for anybody.

Seniors are afraid to give their information to other agencies – they are afraid of being scammed, having their ID stolen, etc.

Senior Clients' Unwillingness to Sign Up for Additional Services

Participants conveyed that senior clients typically focus on one need and do not take advantage of multiple services to meet all of their needs. Moreover, the senior population typically prefers to stay with "tried and true" agencies that are familiar to them instead of expanding beyond their comfort zone.

Seniors like to stick with the same agencies, rather than rotate across agencies.

…Having [senior clients] sign up for services they need is hard. You know they need more but [they] just want grocery shopping.

Participants listed what they believe are the needs of senior clients (in order of importance):

Housing

Social/community connections

Activities of daily living

Affordable in-home support services

Nutrition

Transportation

RECOMMENDATIONS FOR CIE

Participants gave suggestions for how to improve CIE, which are summarized below.

HIPAA Compliance

Participants conveyed that HIPAA regulations and compliance prevented them from entering confidential client data into CIE, and without these limitations they would be more likely to utilize CIE.

> *Because of [CIE's] limited privacy and security capabilities, and that it's a non-HIPAA compliant portal, we were a 'lookup' only participant [could only view what's already there vs. enter or edit data].*

Single Sign-On Entry

Participants expressed a desire for integrating the CIE platform with other case management systems (i.e., "single sign-on entry"), which would eliminate additional steps and time needed for staff members who are already at workload and workflow capacity.

Track Clients More Formally Before and After They Receive Services

Participants expressed the desire and need for more formal and consistent tracking of clients over time (i.e., before and after they receive services) in order to:

- Identify clients at risk
- Follow through on referrals
- Gain a better understanding of the whole person and the whole system
- Understand and address larger social problems

> *Right now, the biggest value is that if I see my patient is using services at another housing facility in the trust network and [I can] see their case worker, I can call them up and say, "I am looking for this CIE participant." And we can have a real conversation because of the trust network.*

> *I would like to use a system that helps me prevent homelessness. For example, are there ways to identify clients at risk for homelessness and match them to the right program?*
>
> *We do refer patients to 2-1-1 a lot. But we never really tracked what happens to them and not in a formal way.*

Emphasize Collaboration Among Partner Agencies

Participants explained that collaboration is necessary and essential to facilitate relationships, connect with other agencies to share information and, ultimately, be successful in meeting client needs (especially in relation to whole person care).

[It’s important to have] a platform where we could talk to other service providers, [because] there can a be a lot of turnover for case workers.

We need to be patient-centered and provide consistent, continued care. I am fine if a patient belongs to another clinic – we can work collaboratively. The idea of “stealing” patients was a concern for some. That is not a concern for us…Having the governance body and developing that trust network is the most important part.

LESSONS LEARNED AND IMPLICATIONS FOR THE FUTURE OF 360° COMMUNITY COORDINATION

The findings revealed that some agencies entered information into CIE and others did not. Moreover, even when some information was entered, it was common that all of the necessary and relevant information was not included. These gaps in client records limit the effectiveness and efficacy of the system.

The referral pathway for 360° Community Coordination holds promise for overcoming some of the challenges of CIE because there will be a client record and corresponding data for each referral. This centralization of intake data should reduce some of the duplicate records and errors that were discovered in the CIE database. Furthermore, 2-1-1 San Diego will be the hub for managing client information and sending notifications to the appropriate agencies who can help meet client needs. This referral pathway that facilitates the sharing of client information truly fulfills the goals of CIE.

Specific lessons learned and recommendations for coordinated care efforts in the future include the following:

- **Interoperability with other systems**: CIE’s role and function should be better defined to agencies in the trust network, including how it differs from other systems that provide coordinated care (e.g., HIE). Similarly, more specific explanations and instructions are needed for all users (e.g., logging in, intake protocol, uploading data, etc.).
- **Agency lead**: To address agencies’ concerns around case management and client workarounds, assign a primary case manager or agency lead from each organization into CIE (if it doesn't exist already) so that clients don't develop workarounds and disrupt existing agreements providers have with them.
- **Legal support**: Because HIPAA compliance issues restricted some agencies from entering data into CIE, increase security and HIPAA compliance and communicate this to agencies in order to successfully recruit agencies to be part of the trusted network.
- **Utilization incentives**: Because some participants emphasized the importance of identifying clients before they need referrals and tracking clients after they receive referrals, educate agencies about the advantages of the assessments and risk rating scales.
- **Workflow considerations**: Encourage agencies to build client lookups into their workflow. This will minimize duplicate client records and likely increase data scalability.
- **Expand data collection**: Create required fields and monitor data entry for thoroughness and accuracy. Consider developing an intake form where all new clients answer the same basic demographic questions.

CONCLUSIONS

This evaluation provided some evidence for the attainment of the overarching goals of CIE's enhanced care coordination network. The quantitative analysis of CIE data revealed associations, or indirect evidence of reduced costs ($1.3 million in savings in EMS transports and ER visits), improved quality of care, and increased efficiency. In addition, significantly reduced EMS transports, and multiple agency enrollments and client lookups provided evidence for plausible associations between CIE and coordinated care efforts.

From the agency interviews, participants expressed that this type of shared information system has much potential to benefit clients through coordinated, whole person care. Sharing information about senior clients, in particular, was important because they may have impairments that compromise their ability to share their complete "story" with agencies. More research is needed to assess clients' experiences and personal feedback, and evaluate other health outcome data (e.g., nutrition, activities of daily living, etc.) to fully understand how CIE translates to better, whole person care for all clients.

Overall, the results from this evaluation highlight 2-1-1 San Diego's efforts to bring agencies together to work with each other, address whole person care, reduce gaps in healthcare and social services, and ultimately benefit those in need throughout the San Diego region.

APPENDIX A. INTERVIEW GUIDE FOR CIE COHORT 2: SENIORS

Introduction

This interview is about the Community Information Exchange, which I will sometimes refer to as CIE. As you know, when service providers enroll in CIE, they can share client information with each other, which enables clients to receive targeted social service and healthcare assistance. I will be asking you questions about your experience as an agency utilizing 2-1-1 San Diego's CIE referral system for senior clients, ages 60 and older, although some questions will pertain to benefits and barriers of accessing resources and services through this referral system for other target populations as well.

Your individual responses will be kept confidential and will only be seen by me and the Caster Center at the University of San Diego, who is our third-party evaluator. Your feedback will be reported in aggregate and we will not attach your name to any of your responses. The summary of aggregated findings will be shared with community partners who are involved in shared information and referral systems.

I would like to audiotape our conversation because it will allow me to pay better attention and have a conversation with you instead of scribbling notes as we go.

Do you consent to participate in this interview and have your responses audiotaped?

Interview Questions

This first set of questions asks about your utilization of, and current experience with, the Community Information Exchange.

1) Please describe your background and history with CIE. How did you get involved with CIE?
2) How does [ORGANIZATION] currently use the Community Information Exchange?
3) What do you and [ORGANIZATION] like most about CIE? What is working well?
4) What needs did you expect CIE to address?
    a) [If they didn't mention data needs, ask: What about your data needs? What data needs did you expect CIE to address?]
5) Have those expectations been met? Why or why not? [Address each need separately]
6) Were there any roadblocks or barriers to adoption?

    [Examples include technical support, user experience, and staffing workload, but do not state examples unless necessary]
7) What don't you and [ORGANIZATION] like about CIE? What isn't working for you?
8) Are there any features that you would like to see added to CIE?

Now I would like to get your input on how CIE serves the senior clients and also other target populations (e.g., homeless, disabled, veterans, etc.).

9) Using the CIE model, what do you think are the main ***benefits*** for senior clients?
10) Do you think there are differences in benefits experienced by target populations other than senior clients? Why or why not?
11) Using the CIE model, what do you think are the main ***barriers*** for senior clients?
12) Do you think there are differences in barriers experienced by target populations other than senior clients? Why or why not?

The following question asks about the social service and healthcare needs of the senior clients in your community as gained from your interactions with them.

13) What are the needs of senior clients overall from their perspective? Please rank the top three needs and check the rest that apply.

___ Housing
___ Nutrition
___ Primary Care
___ Activities of Daily Living
___ Criminal Justice/Legal
___ Income
___ Transportation
___ Utility/Technology
___ Safety/Disaster
___ Employment
___ Health Condition Management
___ Social/Community Connection
___ Personal Hygiene/Household Goods
___ Education/Human Development

14) Thank you for sharing so far. To sum up, I'm going to read some statements and I'd like you to tell me your level of agreement with each one using a 1 to 5 scale where 1 means you strongly disagree with the statement, 2 means you disagree, 3 means you neither agree nor disagree, 4 means you agree, and 5 means you strongly agree.

	1	**2**	**3**	**4**	**5**
CIE helps advance care coordination services through improved care quality.					
CIE helps advance care coordination services through reduced cost.					
CIE helps advance care coordination services through increased efficiency.					
CIE helps advance care coordination services through reinforcement of evidence-based policy decisions.					
CIE helps us as ***agencies*** foster whole-person care.					
CIE helps ***senior clients*** receive whole-person care.					
Overall, I am satisfied with CIE.					
Since being in CIE, I have heard many senior clients say that they are satisfied with CIE.					
I would recommend CIE to other social service agencies.					

15) What advice do you have for other agencies that are considering using shared information and referral systems in their communities?

16) Finally, is there anything else you would like to say about your CIE experience that I haven't asked you about?

Thank you so much for your participation.

INTERVIEWER: NOTE OVERARCHING THEMES

OTHER INTERVIEWER COMMENTS AND IMPRESSIONS

APPENDIX B. REFERENCES

2011-2015 American Community Survey 5-Year Estimates. Available from https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2015/

Caldwell N., Srebotnjak T., Wang T., Hsia R. (2013). “How Much Will I Get Charged for This?” Patient Charges for Top Ten Diagnoses in the Emergency Department. PLoS ONE 8(2): e55491. https://doi.org/10.1371/journal.pone.0055491

City News Service (2013, June 4). San Diego Ambulance Service Cost May Rise. *KPBS.* Retrieved from http://www.kpbs.org/news/2013/jun/04/sd-ambulance-contract/

Dillon, Liam (2013, October 3). What San Diego’s Ambulance Contract Is Worth. *Voice of San Diego.* Retrieved from http://www.voiceofsandiego.org/business/what-san-diegos-ambulance-contract-is-worth/

SANDAG Regional GIS Data Warehouse. (2010). *Major Statistical Area* [Data file]. Available from http://www.sandag.org/index.asp?subclassid=100&fuseaction=home.subclasshome

San Diego County Taxpayers Association (2013). *Emergency Medical Services: An Analysis of EMS in the City of San Diego.* Retrieved from http://www.sdcta.org/assets/files/City%20of%20SD%20EMS%20Insourcing%2010-28-13%20SK.pdf

Sisson, Paul (2014, March 10). *Emergency economics: Q&A with Mike Murphy, general manager of Emergency Medical Response in San Diego.* Retrieved from http://www.amr-sandiego.com/index.php?pid=51