



Getting Home

Outcomes from Housing High Cost Homeless Hospital Patients



2013

Underwritten by the Conrad N. Hilton Foundation, UniHealth Foundation, the Corporation for National and Community Service, the Corporation for Supportive Housing, and the Economic Roundtable



Economic
Roundtable

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This report has been prepared by the Economic Roundtable, which assumes all responsibility for its contents. Data, interpretations and conclusions contained in this report are not necessarily those of any other organization that supported or assisted this project.

This report can be downloaded from the Economic Roundtable and Corporation for Supportive Housing web sites:
<http://www.economicrt.org>
and
<http://www.csh.org>

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Chapter 1

Executive Summary

This study evaluates outcomes from April 2011 to May 2013 for 163 hospital patients screened by the 10th Decile Project in Los Angeles, which works with hospitals to identify the 10 percent of homeless patients with the highest public and hospital costs – the 10th decile – and provide immediate services for placing these individuals into permanent supportive housing. This is affordable housing that provides access to health and social services, such as mental health and addiction therapy, medical care, and case management.

Started in April 2011 with funding from the Conrad N. Hilton Foundation and the UniHealth Foundation, the FUSE (Frequent Users Systems Engagement) 10th Decile Project pilot helps hospitals collaborate with homeless service providers and community health centers to target and house the highest-cost, highest need individuals in supportive housing - and surround them with supportive medical and mental health homes. New federal funding in 2012 from the Social Innovation Fund of the Corporation for National and Community Service awarded through CSH to a team of service providers led by the Economic Roundtable expanded the 10th Decile Project to become one of four sites in a five-year national initiative.

Today, the 10th Decile Project is working with 18 partner hospitals that see over 6,000 homeless inpatients each year, using two 10th decile triage tools to screen for high-cost, high-need homeless individuals and enroll them with experienced community-based homeless service providers. The triage tools employ accurate, simple to use statistical models that analyze information about individuals that is available in hospitals, jails and homeless service agencies affiliated with medical clinics to identify the one-tenth of homeless persons with the highest public costs and the acute ongoing crises that create those high costs. Because there are multiple paths into this highest-cost group, ranging from young persons with psychoses who are publicly disruptive to older persons who are simply very sick, each tool uses a cluster of statistical models specifically designed to assess risk factors for different age and gender groups.

Screening begins when medical staff identifies patients who fit the 10th decile profile. Key elements of the profile are homelessness and above-average use of hospital services. From beginning to end, the screening and engagement process typically takes less than 4 ½ hours.

After the patient is identified, hospital or clinic staff complete a form with check-off boxes for information used in the triage tools. The key pieces of information are the patient's age, gender, diagnosed medical conditions, and use of hospital or jail facilities.

This information is sent to the housing navigator who quickly enters it into the appropriate triage tool. The availability of jail data determines which of the two triage tools is used. One tool uses demographic, medical and incarceration data, the other tool does not use incarceration data, but uses more medical diagnostic information.

If the patient is in the 10th decile, hospital or clinic staff tells him or her about the project and asks if the patient would like to have a place of their own to live in. If the patient wants to participate, the navigator is contacted to come meet the patient. If the patient is not in the 10th decile, he or she is not told about the project.

The transition from the hospital or clinic to the navigator takes place through a warm handoff in which health provider staff, usually a social worker, briefs the navigator on the patient's social and medical background, providing information about the patient's personal characteristics, history of hospital use, presenting issues, diagnoses, and underlying problems. This is followed by a personal introduction of the navigator to the patient.

After the patient is engaged in the project, the navigator assumes immediate responsibility for assisting the individual. This includes assessing what type of temporary housing is needed and providing transportation to the housing site, visiting a Federally Qualified Health Center to arrange follow-up care, and beginning the process of obtaining the documentation and benefits needed to become a permanent supportive housing tenant.

The homeless service providers that navigate housing, health care, public benefits and basic living needs for 10th decile clients are Housing Works, OPCC, Homeless Health Care Los Angeles, PATH, Ascencia, LA Family Housing, San Fernando Valley Community Mental Health, Watts Healthcare Corp, and Watts Labor Community Action Committee. This initiative has the goal of moving 175 high-need, high-cost homeless residents of Los Angeles County into supportive housing by the end of 2014.

As of May 2013, 163 formerly chronically homeless individuals had been screened, 131 individuals were found to be in the 10th decile, 89 had been enrolled in the 10th Decile Project, 36 had moved into permanent supportive housing, 22 were still receiving intensive help to manage the process of stabilizing their lives, and 5 had been placed in other types of permanent housing. These interventions resulted in avoidance of significant public and hospital costs.

- For the 10th decile patients studied in this evaluation who obtained housing, total annual average public and hospital costs per person are estimated to have decreased from \$63,808 when homeless to \$16,913 when housed – excluding housing subsidy costs.
- Total health care costs, including jail medical and mental health care, are estimated to have declined an average of 72 percent, from \$58,962 to \$16,474 per person.

These overall cost reductions are corroborated by hospital billing records for 31 patients in the evaluation group, covering the year before referral into the project and the interval after referral while they were waiting for permanent supportive housing. On an annual average per-person basis, before they obtained permanent housing but while they were receiving services, emergency room visits decreased 50 percent, hospital admissions decreased 71 percent, and inpatient days decreased 84 percent.

Every \$1 dollar in local funds spent to house and support 10th decile patients is estimated to reduce public and hospital costs for the evaluation population that was housed by \$2 in the first year and \$6 in subsequent years.

After taking account of the costs for helping these patients make the transition from homelessness to permanent supportive housing, subsidizing rent, and providing services to help them stay housed, the bottom line financial results from the evaluation are shown in Table 1.

These cost avoidances are contingent on retaining 10th decile clients in permanent supportive housing, which is facilitated by higher rather than lower levels of on-site services, particularly given the severe problems of this population. Eighty percent of the patients screened were in the 10th decile. Patients typically had two or more physical disorders and 42 percent were triply diagnosed with physical, mental and substance abuse disorders.

Table 1
Bottom Line Financial Results from the Evaluation

Category	Amount	Description
Cost Avoidance (Gross)	\$46,895	Annual public costs avoided as a result of housing 10th decile patients for the evaluation population that was placed in permanent supportive housing (\$63,808 in annual costs when homeless vs. \$16,913 when housed)
10th Decile Program Costs	\$15,159	One-time costs to house each patient, including the first year of local subsidies for rent and supportive services
	\$3,518	Annual rent subsidy in the second and subsequent years, in addition to the Section 8 subsidy
	\$3,000	Annual cost for enriched supportive services in the second and subsequent years
Cost Avoidance (Net)	\$31,736	Public costs avoided in the first year after paying the housing subsidy shortfall and one-time costs for housing placement, representing \$2 in public costs avoided for every \$1 spent in the first year
	\$40,377	Public costs avoided, after paying for local housing subsidies and enriched supportive services, in the second year and each year that follows, as long as the patient remains housed. This represents \$6 in public costs avoided for \$1 spent for housing subsidies and supportive services

Sixty-eight percent of patients in the 10th decile were engaged as program participants by the navigators. This opened the door to immediate, comprehensive services and a path to permanent supportive housing.

Virtually every patient who remained engaged obtained permanent supportive housing (98 percent), although this typically took six months and sometimes as long as two years.

This highly effective program can be strengthened and the proportion of high-cost, high-need homeless hospital patients whose needs are addressed through housing rather than through emergency hospital care can be increased through the following steps.

Increase the Housing Supply

The most difficult problem facing the 10th Decile Project is lack of access to permanent supportive housing and extended delays in obtaining housing subsidy vouchers that enable patients to pay rent. This drives up the attrition rate.

Broad housing solutions are needed to increase the supply of permanent housing and reduce time waiting to get into that housing. The following actions are recommended:

- Make more existing project-based permanent supportive housing units available to 10th decile renters.
- Convert tenant-based Section 8 vouchers into project-based vouchers that will provide the financial backbone for converting existing rental complexes into project-based permanent supportive housing sites.
- Make 10th decile individuals a top priority for tenant-based housing subsidies.

- Provide inclusive housing for 10th decile patients with a criminal background or immigration status that is a barrier to obtaining housing.
- Create an ongoing funding source such as housing impact fees for new development or real estate transfer fees to provide substantial, reliable funding for increasing the supply of affordable housing.

Increasing the Engagement Rate

Seventy-one percent of 10th decile patients were engaged by navigators or placed in another program. More of the remaining 29 percent of patients can be engaged by:

- Increasing the effectiveness of hospitals and navigators in achieving a warm hand-off of 10th decile patients.
- Flagging the hospital records of patients who decline to participate and encouraging them to reconsider this decision when they return to the hospital.
- Providing recuperative care or skilled nursing for patients who have health barriers that prevent them from living in permanent supportive housing.
- Improving the capacity of navigators to fill in behind each other in picking up referrals.

Increasing the Housing Rate

The long wait for permanent housing causes significant attrition. Attrition can be reduced and the housing rate increased by increasing funding for temporary housing with private rooms rather than dormitory-style emergency shelters, and notifying hospitals about the identities of missing clients so that they can be reconnected with their navigator when they return.

System Improvements

Hospitals are the primary financial beneficiaries when 10th decile patients are housed. *Providing permanent housing with supportive services to several thousand 10th decile patients will make a striking reduction in the number of chronically homeless patients seen in hospitals, with tangible savings in hospital costs.* Navigators and hospitals should jointly assess the savings that accrue to hospitals when 10th decile patients are placed in permanent supportive housing with ongoing services and identify a feasible and equitable level financial reciprocity for hospitals.

Hospitals should collaborate with the 10th Decile Project to screen all homeless patients in their databases in order to address systematically the problem of homeless patients who are frequent users of emergency health care services as well as to achieve system-wide cost reductions by housing these patients. And hospitals in proximity to each other should integrate data for homeless patients and screen these integrated records to identify 10th decile individuals.

Next Steps

The next phase of the 10th Decile Project will address the recommendations in this evaluation including increasing the availability of permanent housing, expanding the base of financial support, and bringing the project to scale.

Los Angeles 10th Decile Project

Public and Hospital Costs for Homelessness

There is strong evidence that public and hospital costs go down when individuals are no longer homeless. There is also strong evidence that costs for homeless individuals vary widely depending on their attributes. Additional recent information about costs for each public agency before and after homeless individuals are housed led to a series of projects in Los Angeles to identify homeless patients with ongoing health crises that cause extremely high public costs.

Information about public costs for homelessness came from a detailed cost study of a representative sample of 9,186 Los Angeles County residents experiencing homelessness. The study found that the 10 percent with the highest public costs – the 10th decile – accounted for 56 percent of all public costs for homeless adults.¹ Interest in identifying and housing these high-cost, high-need individuals led to development of two triage tools for identifying 10th decile homeless persons that were first piloted in the LA FUSE (Los Angeles Frequent Users Systems Engagement) Project. This report presents evaluation results from the LA FUSE pilot and the follow-on Social Innovation Fund project.

The screening tools employ accurate, simple to use statistical models that analyze information about individuals that is available in hospitals, jails and homeless service agencies affiliated with medical clinics to identify the one-tenth of homeless persons with the highest public costs and the acute ongoing crises that create those high costs. Because there are multiple paths into this highest-cost group, ranging from young persons with psychoses who are publicly disruptive to older persons who are simply very sick, each tool uses a cluster of statistical models specifically designed to assess risk factors for different age and gender groups. Both triage tools and reports explaining them are available on the Economic Roundtable web site.²

The 10th decile of homeless adults with the highest public costs is a critically high need segment of a much larger homeless population needing supportive housing. There is a strong but less than complete correlation between level of cost and level of need; high costs are the result of acute, chronic problems that require expensive public services. However, cost is not an absolute or exclusive measure of need. Some homeless individuals who are not in the 10th decile have problems that have been neglected, and while they may have a high level of need, their needs are not reflected in high public costs.

Prioritizing high-cost frequent users for the scarce supply of permanent supportive housing and care coordination services makes sense because it both improves the health outcomes for these individuals and provides dramatic cost savings for health institutions and public agencies. The tools provide strong objective evidence for identifying 10th decile patients and inmates who merit first priority access to the scarce supply of affordable housing with supportive services based on their high public costs.

Project Creation

In 2010, the Conrad N. Hilton Foundation brought together the Corporation for Supportive Housing and the Economic Roundtable to collaborate in a pilot project to validate the screening tools and assess the viability of a system-based screening, referral, advocacy, and housing network to move high-cost, high-need homeless individuals out of high-cost institutional settings and into permanent supportive housing.

The Corporation for Supportive Housing (CSH) took the lead in developing the housing placement infrastructure, forming linkages with community-based federally qualified health centers (FQHCs), and selecting housing navigation/service providers to deliver integrated health, mental health, and substance use services in coordination with housing providers.

The Economic Roundtable (ERt) took the lead in refining and testing the screening tools, obtaining approval of protocols for protection of human subjects, training discharge planning staff to use screening tools, and screening individuals being discharged to assess whether they were in the 10th decile.

ERt and CSH have taken on the role of participant evaluators to analyze information from the pilot project, report outcomes and identify opportunities for improvement in this report.

Project Teams

Navigators

The project was launched with Housing Works as navigator at California Hospital Medical Center in downtown Los Angeles and with Ocean Park Community Center (OPCC) as navigator and clinic site, collaborating with Saint John's Health Center and Venice Family Clinic in Santa Monica. It expanded to include Los Angeles County-USC Medical Center, and grew steadily to include 9 additional hospitals during the April 2011 to January 2013 patient intake window for this evaluation. Records for the first 163 patients screened out of referrals by 11 hospitals and clinics affiliated with the project were used for this evaluation. These thirteen hospitals are shown in Figure 1. The first patient referred was screened in April 2011. The latest referral included in this evaluation was screened in January 2013.

As this report is being completed, 18 hospitals are participating or making arrangements to participate in screening and housing high need patients, either through the FUSE project or the follow-on project supported by Social Innovation Funds (SIF) from the Corporation for National and Community Service.

CSH organized teams at FUSE sites, and ERt at SIF sites, to provide immediate, comprehensive, coordinated services for 10th decile patients. This complete package of services is critical given the high level of need among these patients. The pivotal agency at each site is the service provider/housing navigator agency. The navigators are responsible for meeting all of the patient's needs, beginning with engaging the individual in the hospital and continuing all the way through housing placement and post-housing follow-on support.

The navigators were selected based on their extensive experience and record of effectiveness in helping high-need homeless individuals successfully transition into permanent housing and in providing the services needed for their continued well-being.

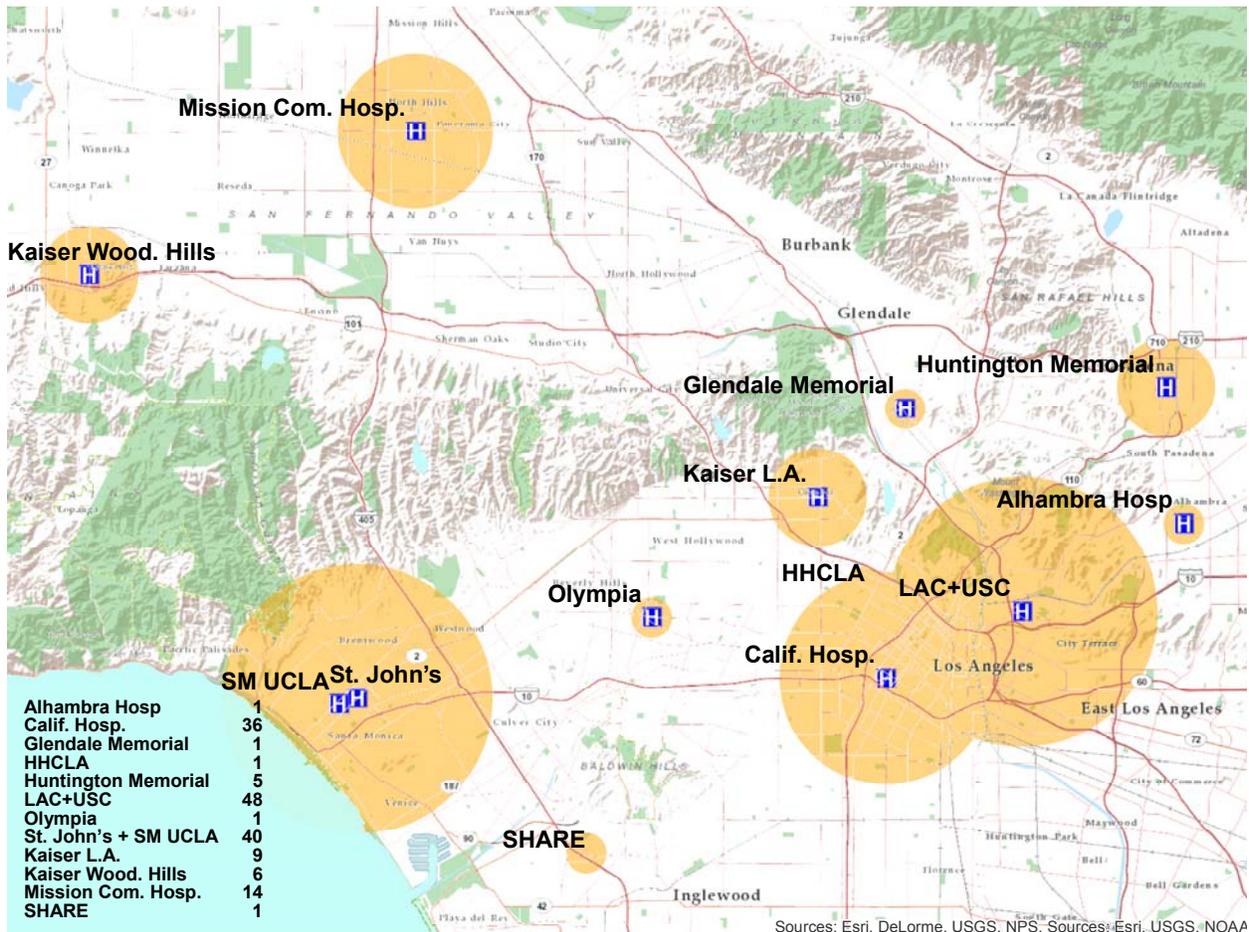
In order to have a reliable sample of cases to evaluate, records of clients from three phases of project development are included in this evaluation. All of the project phases use the same patient screening and service delivery model. The first and second phases were launched with funding from the Conrad N. Hilton and UniHealth foundations.

The *first phase*, the FUSE pilot, received 72 hospital referrals who were screened using the triage tools. Patients in the 10th decile were handed off to three service delivery teams organized by CSH. The navigator agencies for this *first phase* are described below.

Ocean Park Community Center (OPCC), founded in 1963, has an interim and permanent supportive housing model based on a harm reduction philosophy that moves people into permanent housing as quickly as possible and provides comprehensive services to help individuals retain their housing. Venice Family Clinic co-located on-site, 12 respite beds and close coordination with 2 local hospitals provide wrap-around services for moving homeless patients into housing.

Homeless Health Care Los Angeles, founded in 1985, provides integrated health, behavioral health and housing services using a harm reduction model based on "whatever

Figure 1
Hospitals that Identified and Referred 163 Patients for 10th Decile Screening



it takes” to reach, engage and house the individual. Their stated goal is to provide a comprehensive, coordinated health, mental health and substance abuse treatment system integrated with permanent housing.

Housing Works, founded in 2003, uses housing first and harm reduction strategies, and a mobile integrated service team that actively outreaches and engages chronically homeless persons challenged by serious mental illness, addictions, and chronic health conditions. It assists these individuals in applying for/obtaining benefits, rental subsidies, and scattered site permanent housing, and provides on-going “for however long needed” supportive services/care management once the person is housed.

The *second phase* began after the ERt team was selected for a national Social Innovation Fund (SIF) grant underwritten by the Corporation for National and Community Service and awarded through the Corporation for Supportive Housing. The first 71 referrals screened through the Social Innovation phase of the program were included in this evaluation. This phase was carried out by the three navigators that launched the FUSE pilot as well as two new navigators described below.

Ascencia, incorporated in 2006, provides comprehensive homeless services and housing to homeless individuals and families in the greater Glendale area. Services include street outreach, an Access Center with case managers specialized in addiction recovery and mental health, on-site psychiatrist and trauma therapist. Ascencia’s partnership with local hospitals to reduce readmissions led them to join the 10th Decile Project.

People Assisting the Homeless (PATH), founded in 1984, fields street outreach teams that provide individualized client support to address barriers, increase income, and sustain permanent housing. Their strategy combines assertive street outreach and engagement, case management, peer support, motivational interviewing, and on-going supportive services to tenants. PATH’s outreach efforts include vulnerability survey projects.

The *third phase* grew out of direct funding from the Conrad N. Hilton Foundation for a service delivery collaborative in the San Fernando Valley led by *L.A. Family Housing*. The first 20 patients referred by San Fernando Valley hospitals and screened using the triage tools were included in this evaluation. The navigator is:

San Fernando Valley Community Mental Health Center Inc., founded in 1970, provides a continuum of therapeutic programs for children, adolescents and transitional age youth with serious emotional disorders, and adults with severe and persistent mental illness.

In addition, a navigator staff position internal to the hospital was created at Kaiser Permanente-Woodland Hills to assist homeless patients in obtaining needed services as well as to connect them with the navigator at San Fernando Valley Community Mental Health Center.

The service delivery models of all of the navigators include using the 10th decile screening tools to identify the target population, deeply subsidized affordable housing, housing-based supportive services (i.e. care management), and coordinated primary and behavioral health services. The navigators, communities they serve, referring hospitals, temporary housing providers, and providers of immediate primary and behavioral health care are shown in Table 2.

Table 2
Organizations Providing Services Covered by Evaluation

Service Provider, Housing Navigator	Screened Cases in Evaluation	Service Area	Hospitals Referring Patients	Temporary Housing	Immediate Primary & Behavioral Health
Ocean Park Community Center (OPCC)	40	West Los Angeles & Santa Monica	HEARTH Partnership: OPCC, Venice Family Clinic, Saint John's Health Center, Santa Monica-UCLA Medical Center	SAMO-SHEL, Daybreak, Turning Point, motels	Venice Family Clinic
Housing Works	51	Central & East Los Angeles (includes LA's Skid Row) Pasadena, San Gabriel Valley	LAC + USC, California Hospital Huntington Memorial Hospital	SRO Housing, motels Union Station, motels	JWCH, Clinica Romero CHAP, Comprehensive Community Health Center
Homeless Health Care Los Angeles (HHCLA)	29	Central & East Los Angeles (includes LA's Skid Row) Alhambra Fairfax/Mid-City	LAC + USC Alhambra Hospital Olympia Medical Center	Motels	HHCLA
Ascencia	1	Glendale, East San Fernando Valley	Glendale Memorial Hospital	Ascencia	Comprehensive Community Health Center
PATH	10	Hollywood & West Hollywood	Kaiser Permanente-Los Angeles & Hollywood Presbyterian Hospital	PATH, motels	JWCH Clinic at the PATH Mall
San Fernando Valley Community Mental Health Center	20	San Fernando Valley	Mission Community Hospital, Kaiser Permanente Woodland Hills	L.A. Family Housing	San Fernando Valley Community Mental Health Center
Patients screened but not seen by a navigator	12	Patients screened by the Economic Roundtable and determined not to be in the 10 th decile or to have an attribute that precluded access to permanent supportive housing			

Referrals

The sources of referrals during the evaluation window are shown in Table 3. Two-thirds of the 163 referrals (69 percent) came directly from hospitals. Los Angeles County-USC and California Hospital, both of which serve downtown Los Angeles, provided the most hospital referrals.

Another third (30 percent) of the referrals came from OPCC and PATH’s outreach program, both working in collaboration with hospitals. OPCC’s on-site clinic operated by Venice Family Clinic works closely with Saint John’s Health Center and identified 40 homeless patients who were screened.

PATH’s street outreach program works closely with

Kaiser Permanente-Los Angeles Hospital and identified 9 homeless patients who were screened.

Two referrals came through agency staff at HHCLA and SHARE who obtained the medical data needed for screening with the triage tools.

Table 3
Referral Sources and for 163 Patients that were Screened

Referral Source	Screened
Alhambra Hospital Medical Center	1
California Hospital Medical Center	36
Glendale Memorial Hospital	1
Homeless Health Care Los Angeles (HHCLA)	1
Huntington Memorial Hospital	5
Los Angeles County + USC Medical Center	48
Olympia Medical Center	1
OPCC, Venice Family Clinic, Saint John's, Santa Monica-UCLA	40
Kaiser Permanente Los Angeles thru PATH Street Outreach	9
Kaiser Permanente Woodland Hills Medical Center	6
Mission Community Hospital	14
Self-Help and Recovery Exchange (SHARE)	1
<i>Total</i>	<i>163</i>

10th Decile Training

During start-up activities with each hospital and navigator, the Economic Roundtable provided training in using the triage tools to screen and identify 10th decile patients. This included training hospital social workers and social service agency staff in how to identify likely 10th decile patients and how to fill out the hospital information form that is used for screening. The Roundtable carried out the initial screenings at each site, coming to the hospital to screen patients, and making a warm hand-off of eligible 10th decile patients to the navigator. After the project was established at that site, responsibility for carrying out screenings was handed off to either the navigator or the hospital, depending on the agreed upon division of labor at the site.

Immediate Primary and Behavioral Health Care

There is an immediate need for primary and behavioral health care after clients are engaged and while they are waiting for permanent supportive housing. The providers of this care are listed in Table 2. Navigators link clients with primary health care providers at FQHCs and encourage them to seek care from these providers rather than from hospital emergency rooms. Later, after clients are placed in permanent supportive housing, which often is located in a different community, a permanent medical health home is established.

Mental health care, particularly immediate emergency care is often needed but difficult to obtain. A broken mental health system that is underfunded and often inaccessible to patients

with psychiatric emergencies is critical problem. This is an ongoing challenge for navigators. Another challenge is obtaining inpatient medical detoxification for the roughly one-fifth of clients who have severe substance abuse problems. There often is a wait of thirty or more days for inpatient detoxification.

Temporary Housing

Temporary housing is provided for intervals that last up to six months, while the documentation and approvals needed for permanent supportive housing are obtained. The quality and type of temporary housing varies from one community to the next. In the downtown Los Angeles area, SRO Housing is able to provide individual rooms for clients and HHCLA is able to rent affordable rooms at a nearby hotel. In Santa Monica, the primary resource for temporary housing is a dormitory style emergency shelter. In the San Fernando Valley, the LA Family Housing Valley Shelter is houses participants in rooms with three persons. In other communities, motels are the only source of temporary housing.

Temporary housing that offers private rooms is more appealing to clients and improves project retention rates; however, it typically becomes unaffordable if the process of obtaining permanent housing lasts longer than several months. In those instances, the options for clients often are to move to a shelter or return to the streets while they wait for permanent housing.

Permanent Supportive Housing

Scattered-site housing is used for most permanent placements, with navigators providing ongoing supportive services through site visits that are responsive to the tenant's needs and sufficiently flexible to respond to emergencies. Scattered sites are used because there are not sufficient units available in project-based sites, and also because a large share of project-based sites are in proximity to Skid Row, which clients often want to avoid because of the high level of substance abuse and risk of criminal victimization in that area.

Placements in scattered site housing result in the navigator being the sole provider of supportive services, in contrast to placements in project based permanent supportive housing where the navigator augments an existing supportive service infrastructure. Given the acute medical and mental health needs of 10th decile clients, it would be beneficial to broaden collaboration with permanent housing providers outside of Skid Row. A key to this collaboration is the long-term commitment by navigators to provide continuing supportive services for these high-need clients.

Identifying and Enrolling 10th Decile Patients

The steps in screening to identify patients in the 10th decile, then enrolling them are shown in Figure 2. Two central objectives in the screening process are first, to use accurate and complete medical information as well as interview responses to produce accurate screening results. Second, to avoid presenting the project to patients and raising their hopes about having a place of their own in which to live, but then disappointing them when they are screened out of the project because they are not in the 10th decile.

Steps in Figure 2 that are carried out by medical staff are highlighted in green; steps carried out by navigators are highlighted in orange.

Pre-screening (Steps 1-2 in Figure 2)

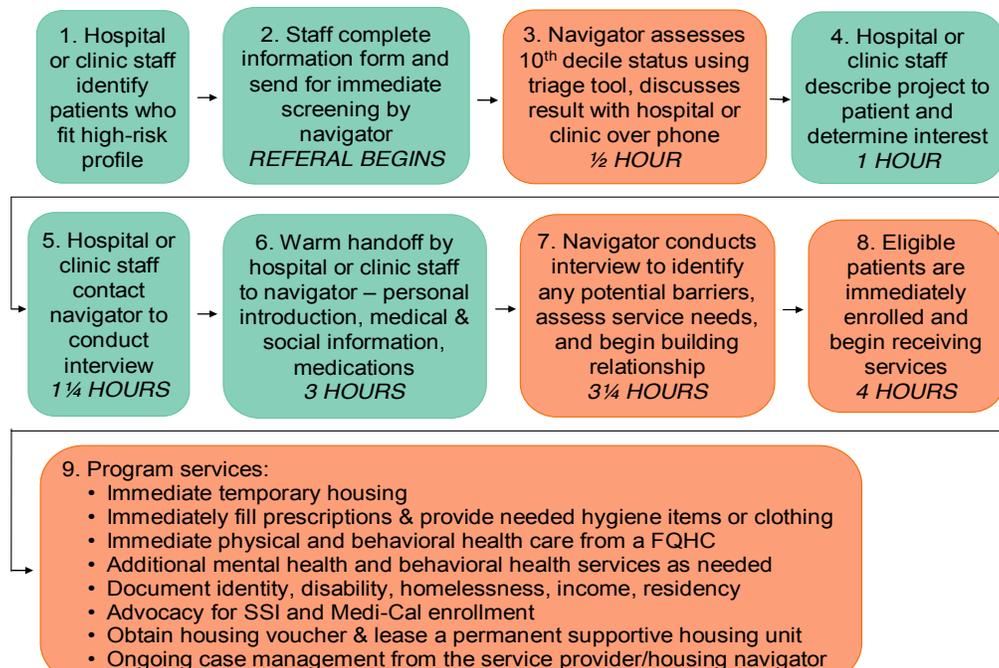
Medical staff identifies patients who fit the profile of individuals in the 10th decile. Often this is done by hospital social workers. The key elements of the profile are that patients are homeless and have above-average use of hospital services. For example, aside from any other health factors and without any jail time, a patient who has been admitted to the hospital as an inpatient several times in the past two years is in the 10th decile.

Most of the patients in the evaluation sample were hospital inpatients, often with hospital lengths of stay exceeding three days. This allowed for multiple conversations between the patients and hospital staff to build trust and discuss the patient’s hopes for his or her life after leaving the hospital.

After a patient who fits the 10th decile profile is identified, hospital or clinic staff complete a form with check-off boxes for information used in the triage tools. The key pieces of information are the patient’s age, gender, diagnosed medical conditions, and number of visits to the hospital over the past two years. If available, information is also obtained about use of other hospitals and jail stints.

The form also collects information that flags probable barriers to obtaining HUD Section 8 vouchers, which are typically used to pay most of the monthly rent for permanent supportive housing. In addition, the form collects information for assessing whether the patient has ongoing nursing needs that require care in a skilled nursing facility rather than in permanent supportive

Figure 2
Flow Chart of Steps in 10th Decile Screening



housing. A copy of the form used to compile this information is included in the *Appendix*.³

Information sharing between health providers and navigators is managed so as to comply with HIPAA guidelines.⁴ If there is a business associate agreement between the health provider and navigator, patient identifiers are included in the information. If there is not an agreement, information is shared on a de-identified basis until the patient has signed an authorization for release of medical information.

Screening (Steps 3-5 in Figure 2)

The completed hospital information form is sent to the housing navigator, who quickly enters the information into the appropriate triage tool. The availability of jail data determines which of the two triage tools is used. The *first tool*, released in 2011, uses 27 pieces of information including length of incarceration and type of incarceration facility. It partitions individuals being screened into three sub-groups based on age, with separate statistical models for each group. If good data about incarceration history *is* available, the first tool is more reliable; if good incarceration history data is *not* available, the second tool is more reliable. Both tools measure the same thing, the likelihood of being in the 10th cost decile.

A limitation of the first tool is that when working with patients in hospital settings, it is often difficult to obtain reliable information about episodes of incarceration. One reason is that patients may prefer not to disclose stigmatizing information. Another reason is that individuals in the 10th decile are often poor historians of their own lives and unable to provide clear information about whether episodes of incarceration occurred in the past two years, how long the incarceration lasted, or the type of facility in which they were incarcerated.

The *second tool*, released in 2012, was developed to eliminate the need for incarceration data. It uses 51 pieces of information available in hospital settings and partitions individuals being screened into four sub-groups based on gender and age, with separate statistical models for each group. It makes more extensive use of medical information than the first version of the tool. The majority of clients in this evaluation were screened using the second tool.

If either tool shows that the probability of the patient being in the 10th decile is 0.35 or higher, hospital or clinic staff describe the project to the patient and explain that it is possible he or she may be able to get a place of their own in which to live. If the patient is interested, hospital staff informs the navigator of this, and the navigator comes quickly, within one to two hours, to the hospital to interview the patient. The typical timeline for the screening and hand-off process is shown in steps 2 through 8 of Figure 2.

If the probability is less than 0.35, the cutoff point, the reasonableness of this outcome can be reviewed by staff. If warranted, negative results from the tool can be overridden based on clinical judgment. *The triage tool is designed to assess the current level of public costs for a patient, not to predict future costs.* If a patient were recently diagnosed with a high-cost medical condition, this would be an important factor to take into consideration in deciding whether to override results from the tool and include the patient in the 10th decile group based on the strong likelihood of high public costs in the future.

Among the cases included in this evaluation, one person who was not in the 10th decile was engaged and provided with permanent supportive housing. This was a woman in her early 40s who used the emergency room frequently and had multiple health problems but who had not

yet been admitted as a hospital inpatient. Her diagnoses included psychosis, depression, hypertensive disease, chronic pulmonary disease, and musculoskeletal disease.

The time window for screening and referrals is currently limited to normal business hours, Monday through Friday. This reflects a mismatch of scale and operating hours between hospitals, which are large complex organizations operating around the clock, and nonprofit homeless agencies, which are much smaller organizations, with staff typically limited to business hours. As a consequence, navigators currently do not have the capacity to respond to referrals of homeless patients seen by hospitals at night or over the weekend, as often is the case.

Warm Hand-off (Step 6 in Figure 2)

The transition from the hospital or clinic to the navigator takes place through a warm handoff in which health provider staff, usually a social worker, briefs the navigator on the patient's social and medical background, providing information about the patient's personal characteristics, history of hospital use, presenting issues, diagnoses, and underlying problems. This is followed by a personal introduction of the navigator to the patient.

Interview and Enrollment (Steps 7-8 in Figure 2)

The navigator's meeting with the patient in the hospital is the final step in the screening process and the first step in building a long-term relationship with growing trust. In order to obtain a lease from a permanent supportive housing provider, the patient typically needs to have both a Section 8 housing voucher to pay the bulk of the rent and an ongoing source of income, most often from Supplemental Security Income (SSI) to cover the tenant's portion of the rent and to pay living expenses. Among other things, the interview determines whether there are any showstoppers for obtaining a Section 8 housing voucher.

Six barriers can prevent individuals from having access to permanent supportive housing because of limitations on publicly funded housing subsidies, or local restrictions of some jurisdictions and housing providers, or the program design of supportive housing itself. During the screening interview, these barriers are identified and the patient is asked if any of them apply to him or her. At a minimum, this provides fair warning to the patient about these barriers, should they come up while seeking to qualify the individual for permanent supportive housing. The barriers are:

1. Undocumented immigration (barrier to local, state and federal subsidies)
2. Being on parole for a violent crime (currently a barrier for Section 8 housing vouchers issued by Los Angeles County's Housing Authority)
3. Conviction for arson (screening criteria for some but not all housing providers)
4. Conviction for operating a methamphetamine lab (barrier to federal housing subsidies)
5. Convicted for an offense that requires registering as a sex offender (barrier to federal housing subsidies)
6. Not expected to recover from a disorder or injury to the extent that the individual will be able to live independently without continuing nursing care. (Supportive housing does not

provide on-site nursing care and tenants must be sufficiently ambulatory to be able to live independently.)

Ongoing Engagement and Support (Step 9 in Figure 2)

The identification of probable 10th decile patients, triage tool assessment, and follow-up interview all occur quickly - within two hours if possible. This is necessary because the hospital often needs the bed for another patient, and also because the patient may be restless to leave the hospital. For example, patients may be addicts or alcoholics and may want to return to the street to self medicate.

After the patient is engaged in the project, the navigator assumes immediate responsibility for assisting the individual. This includes assessing what type of temporary housing is needed and providing transportation to the housing site, visiting a Federally Qualified Health Center to arrange follow-up care, and beginning the process of obtaining the documentation and benefits needed to become permanent supportive housing tenant. These services are provided using a Housing First approach.⁵

Integrating Housing and Health Care

The triage tools are being used in combination with hospital records to successfully screen and identify high-need high-cost patients on a *case-by-case* basis. The next step in integrating these tools with the health care system is to use the same hospital record systems to screen *systematically* all homeless patients who have been seen by hospitals so that individuals in the 10th decile are immediately flagged when they return to the hospital. For example, there are 14 hospitals located within 5 miles of downtown Los Angeles. Gathering patient data from all area hospitals and identifying homeless patients' utilization of all hospitals would be an effective method for identifying most of the 10th decile population in this area. This would enable the program to reach many more patients that are eligible and also allow more time for a warm hand-off to navigators, and for navigators to engage the patients successfully.

The outcome data presented in the following chapter shows that substantial time and money must be invested to move patients from hospitals into permanent housing. In some cases, multiple cycles of engagement are needed before patients are successfully placed in permanent housing. The pay-off for this investment is system wide rather than patient-by-patient. It is system wide because the payoff in reduced health care costs is convincingly achieved when the overall population of homeless persons receiving emergency care in hospitals is reduced rather than when an individual patient is referred to a navigator.

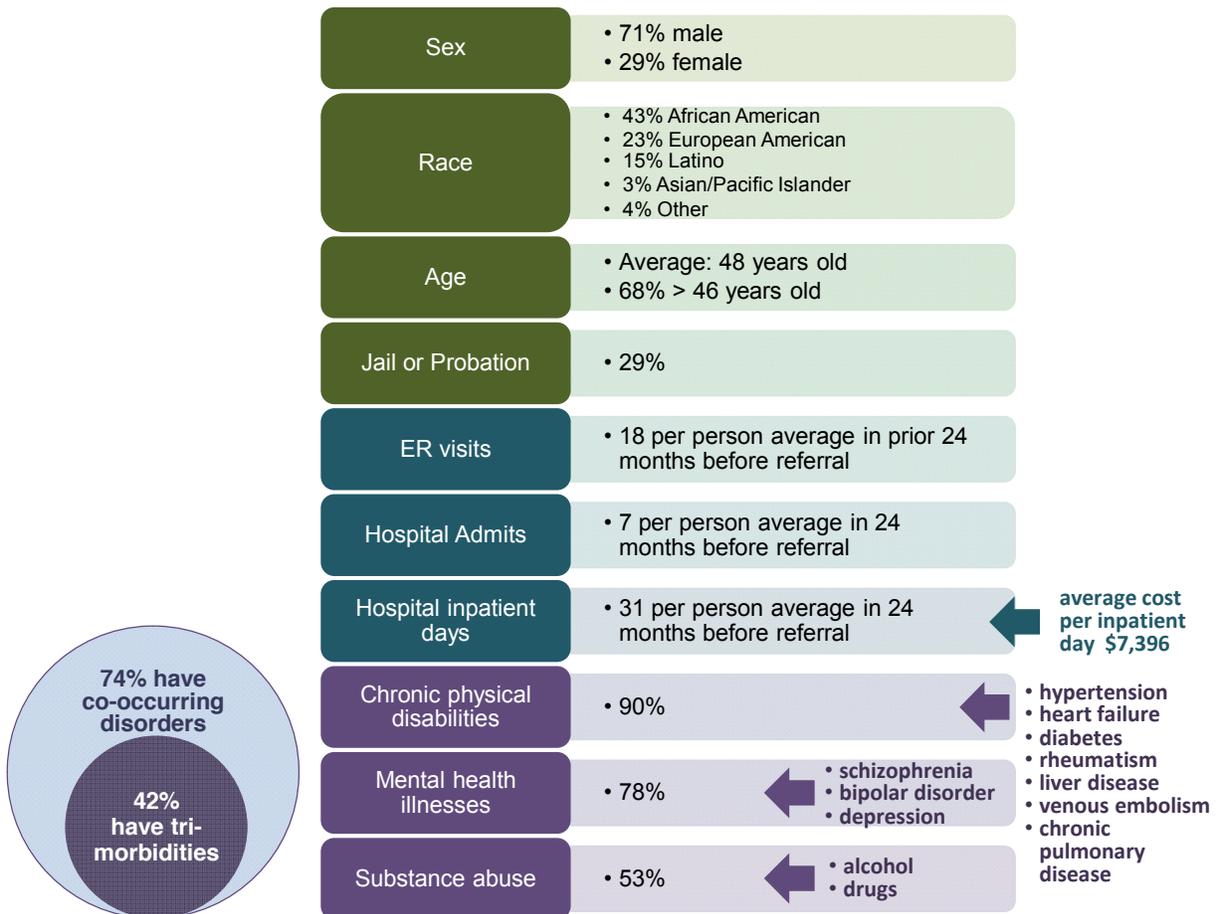
Patient Profile and Outcomes

Patients Screened

A profile of the 163 patients who were screened is shown in Figure 3. Demographic highlights include:

- Over two-thirds (68 percent) of the patients screened were 46 years of age or older. The average age was 48 years, the median age was 49 years; the youngest person was 18, the oldest was 76.
- Most had local origins, with 30 percent born in another state and 7 percent born in another country. Only 3 percent had a primary language that was not English.
- Men made up the majority, 71 percent, and women accounted for 29 percent of referrals.
- African Americans were referred more frequently than any other ethnic group (43 percent of persons screened), followed by European Americans (23 percent), Latinos (15 percent), Asian/Pacific Islanders (3 percent), and Other (4 percent).

Figure 3
Baseline Profile of 163 Persons Screened



percent), and Asian/Pacific Islanders (4 percent).

- Twenty-nine percent reported having a jail or probation record.
- Six percent reported being veterans.

Almost everyone (93 percent) had been an emergency room patient in the past three years, and 78 percent had been hospital inpatients. Average rates of hospital use in the past two years by the 163 patients screened were:

- 18 emergency room visits per person
- 7 hospital admissions per person
- 31 inpatient days per person

Patients who were screened typically had two or more physical disorders (90 percent had at least one physical disorder) and frequently had mental health disorders. The body systems most frequently distressed were:

- Mental – 78 percent, most frequent among women – 85 percent
- Circulatory system – 42 percent, most frequent among African Americans – 54 percent
- Musculoskeletal Disorder – 28 percent, most frequently rheumatism
- Respiratory Disorder – 23 percent, most frequently chronic pulmonary disease
- Digestive Disorder – 23 percent, most frequently gastritis
- Endocrine Disorder – 15 percent, most frequently diabetes

Fifty-three percent were identified as having substance abuse disorders when screened, although this is undoubtedly an undercount since individuals often conceal this problem.

- 42 percent were triply diagnosed with physical, mental and substance abuse disorders
- 47 percent were diagnosed with both mental and substance abuse disorders
- 48 percent were diagnosed with both physical and substance abuse disorders
- 67 percent were diagnosed with both mental and physical disorders

Patients in the 10th Decile

Eighty percent, or 131, of the patients screened were in the 10th decile,⁶ as shown in Figure 4. Within different breakouts of the screened population, rates of inclusion in the highest cost, highest need patient population that makes up the 10th decile were as follows:

- The small number of young adults 18 to 29 years of age had the highest inclusion rate (86 percent) within age group breakouts.
- Men were slightly more likely than women to be in the 10th decile (81 vs. 79 percent).
- African Americans had the highest inclusion rate of any of the three largest ethnic groups (93 percent), and Latinos the lowest (76 percent).
- Patients with digestive disorders had the highest inclusion rate of any diagnostic major category (86 percent); musculoskeletal disorders had the lowest rate (67 percent).
- Patients with mental disorders had an 83 percent inclusion rate.
- Patients with both mental and substance abuse disorders had an 88 percent inclusion rate.
- Patients triply diagnosed with physical, mental and substance abuse disorders had a similar inclusion rate – 87 percent.

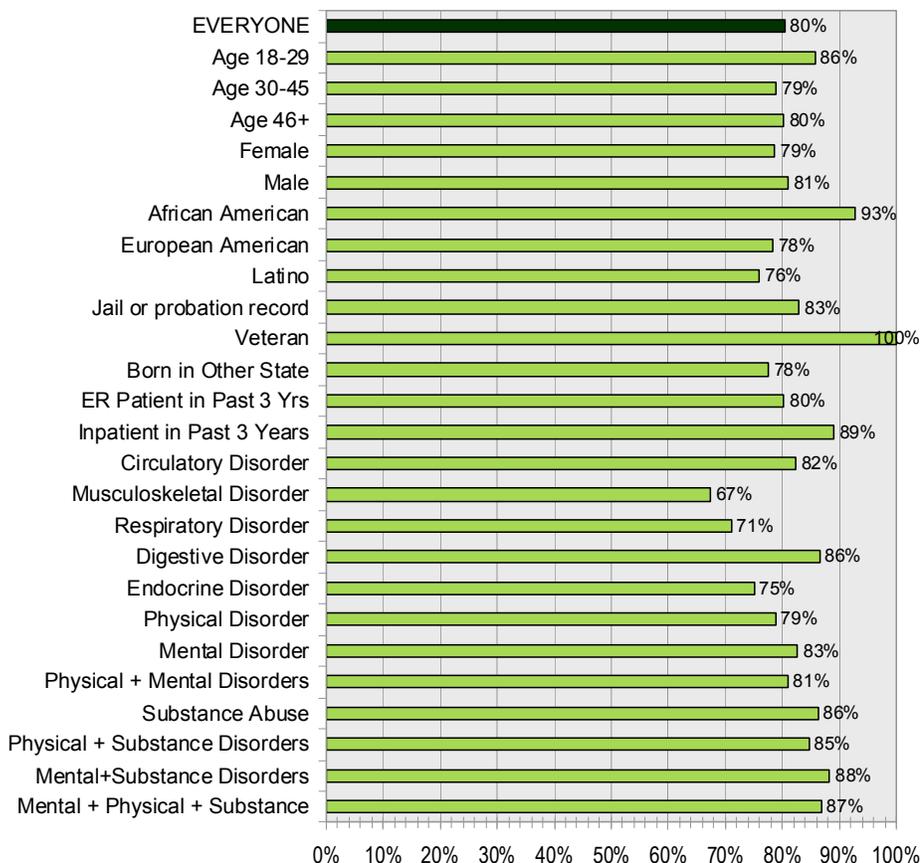
Patients who were screened and determined *not* be in the 10th decile based on their triage tool score were *not* informed about the program and received standard discharge services from the hospitals. Patients in the 10th decile who were not known to have an attribute that would prevent them from obtaining a housing subsidy were handed off to a navigator for final screening to determine whether they would be invited to participate in the program.

Patients Engaged by Navigators

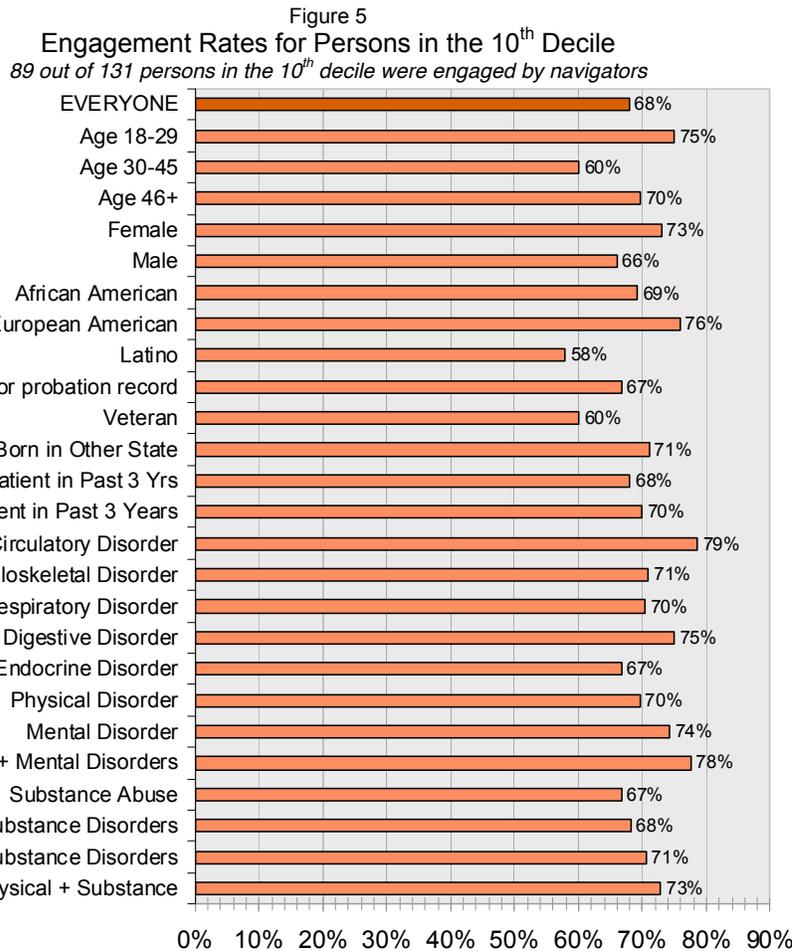
Sixty-eight percent, or 89, of patients in the 10th decile were engaged as program participants by the navigators, as shown in Figure 5. This includes the person who was identified as 10th decile based on a clinical over-ride of the triage tool score, and then engaged. Engagement opened the door to immediate, comprehensive services and a path to permanent supportive housing. Engagement rates for different breakouts of the 10th decile population are shown in Figure 5. Some of the groups shown represent small client samples, and outcome data for them should be treated cautiously. Table 8 in the *Statistical Appendix* shows the number of persons in each group.

- Young adults, 18-29 years old, had the highest engagement rate (75 percent), followed by the oldest group, 46 years or older (70 percent).
- Women were more likely to be engaged than men (73 vs. 66 percent).
- European Americans had the highest engagement rate of any of the three largest ethnic groups (76 percent), and Latinos the lowest (58 percent).
- Patients with circulatory disorders (most often hypertension) had the highest engagement rate (79 percent), followed by digestive and mental disorders (75 percent).

Figure 4
Percent of Persons Screened who were in the 10th Decile
131 of the 163 persons screened were in the 10th decile



- Patients with endocrine system disorders (most often diabetes) had the lowest engagement rate of any of the most frequently identified medical diagnoses (67 percent).
- Patients in a variety of small diagnostic groups had below-average rates of engagement; including genitourinary system disorders (64 percent), infectious diseases (62 percent), skin disorders (58 percent), and injuries (55 percent).



- There were progressively higher rates of engagement for dually and triply diagnosed patients, starting with substance abuse alone (67 percent) substance abuse and a physical disorder (68 percent), substance abuse and a mental disorder (71 percent), and mental, physical and substance abuse disorders (73 percent).

Reasons why 10th Decile Patients were Not Engaged

The objective of the FUSE and SIF programs is to house the highest cost and highest need patients whom it is feasible to place in permanent supportive housing. When 10th decile patients were not engaged by navigators, it was because it was not feasible to house them.

The specific reasons why 42 10th decile patients in the evaluation population were not engaged are broken out in Figure 6.

- 37 percent of the patients who were not engaged were excluded because there was an insurmountable barrier to housing them. Reasons for exclusion are described in Figure 7 in the next section.

- 27 percent were “no shows” – they could not be found by the navigator, often because they had left the hospital premises before the navigator arrived.
- 20 percent declined to participate in the program. Paranoia was often a factor in this decision, and in some cases the patients were intoxicated. In other cases, patients were deeply connected to the hospital and did not want to leave that setting.
- 12 percent were referred on days when navigators did not have the capacity to engage them - usually because a recent influx of referrals was taking up all of the time of navigator staff, creating a situation in which no new referrals could be absorbed.
- 5 percent already had case management agreements with other programs and were reconnected with those programs.

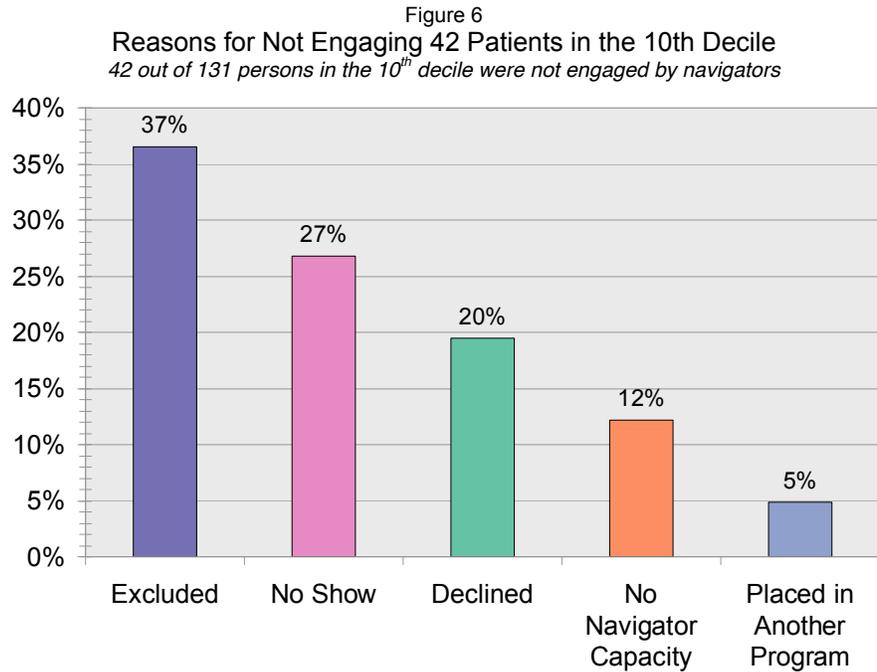
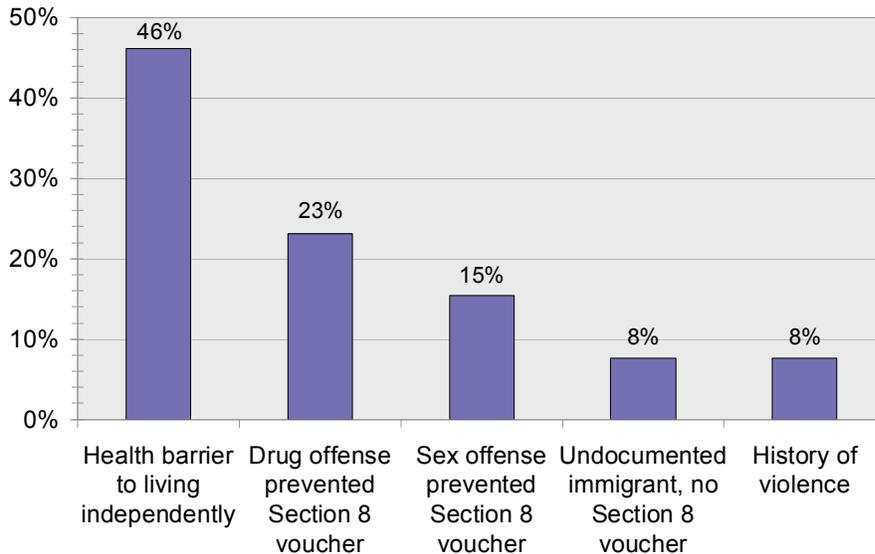


Figure 7
Reasons for Excluding 15 Patients in the 10th Decile
15 out of 41 persons in the 10th decile who were not engaged by navigators were excluded



Reasons for Excluding 10th Decile Patients

Fifteen of the 42 10th decile patients who were not engaged were excluded for different reasons. Of those who were excluded, 46 percent had acute health problems that would prevent them from living independently in permanent supportive housing and that made them candidates for skilled nursing facilities. For example,

some of the patients were not sufficiently mobile to get in and out of bed at night by themselves. This breakout is shown in Figure 7.

Nearly a quarter (23 percent) of those excluded had criminal convictions that would prevent them from receiving Section 8 housing subsidy vouchers under policies currently enforced by the housing authorities of the city and county of Los Angeles.

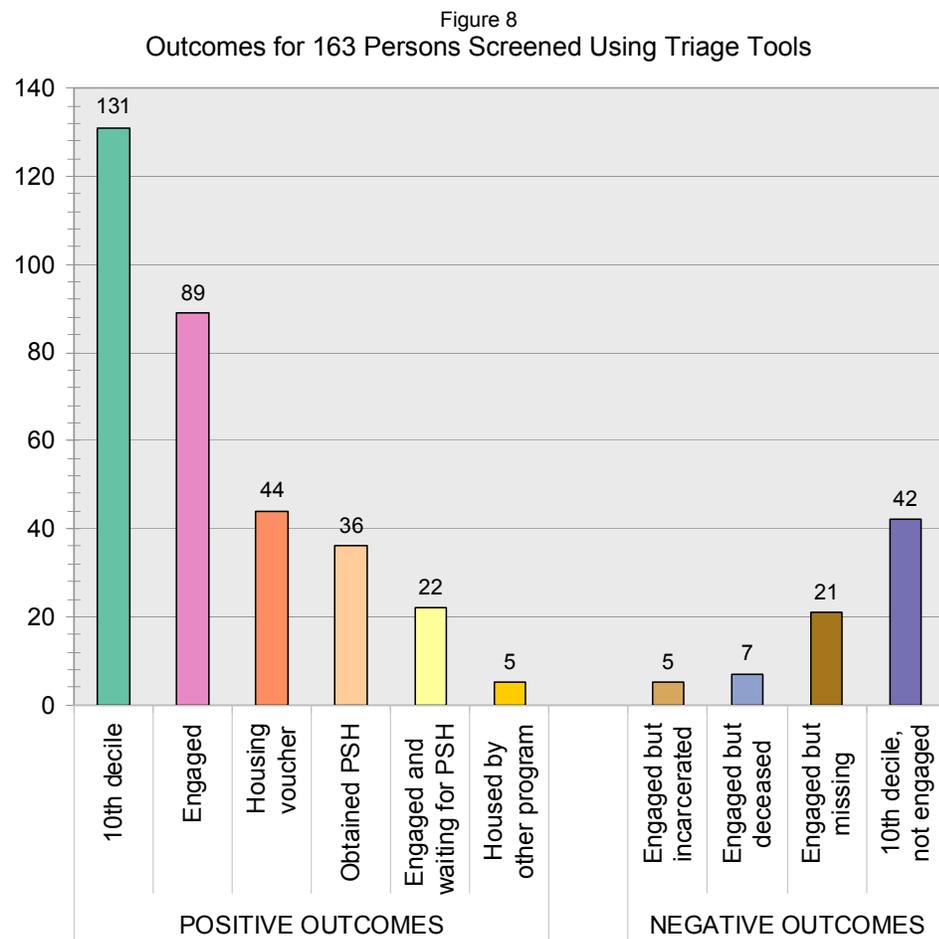
Fifteen percent of those excluded (2 individuals) had been convicted of offenses that required them to register as sex offenders, preventing them from being eligible for Section 8 vouchers.

One individual (making up 8 percent of those excluded) was an undocumented immigrant, precluding eligibility for a Section 8 voucher.

One individual (8 percent of those excluded) had a history of dangerous violence.

Outcomes To-date for 163 Patients Screened

Outcomes as of May 17, 2013, the closure date for information shown in this report about the status of the 163 patients who were screened, are shown in Figure 8. Positive outcomes for



the 131 patients in the 10th decile who were potentially eligible for program engagement included:

- 89 were engaged by navigators, including 1 person added to the 10th decile through a clinical over-ride
- 36 had been placed in permanent supportive housing (PSH) as of May 2013
- 22 who had not yet obtained housing remained actively engaged

Numbers do not foot because some people are in more than one category, e.g., of people housed, 2 are deceased and 1 is missing.

- 5 had been engaged and provided with housing through other programs, for example, at skilled nursing facilities
- Negative outcomes included:
- 5 individuals were engaged but came to the attention of the criminal justice system and were incarcerated
 - 7 individuals died after they were engaged by navigators; sad evidence of the acute health problems in the 10th decile population
 - 21 individuals had been engaged but were missing and could not be located
 - 42 10th decile individuals were not engaged for the reasons described earlier

Differences in Housing Rates among Patients Engaged by Navigators

The degree of stability in clients' lives is one key factor influencing the length of time it takes for them to obtain permanent housing. Individuals vary in their capacity to show up for appointments, assist in obtaining needed documents and approvals, as well as develop trust in the likelihood of obtaining permanent housing.

A second key factor for maintaining client engagement is the quality of temporary housing. Continuous housing in a private room strengthens engagement. Dormitory style housing in shelters or intermittent housing interspersed with residing on the street weakens engagement.

A third key factor that speeds up or slows down the transition into permanent housing is access to Section 8 vouchers to provide an ongoing rent subsidy for clients. At the beginning of this project, long waits were typically required for obtaining Section 8 vouchers. Despite strong support from the Housing Authority of the City of Los Angeles, a time-consuming approval process was slowed down further by staff shortages caused by cutbacks in federal funding. During the last six months of the evaluation, this undesirable situation deteriorated further when the federal budget sequester reduced the number of Section 8 vouchers, making new vouchers virtually unavailable.

Two of the three key reasons for why more individuals were not housed were housing related - lack of adequate temporary housing options following engagement, as well as delay and uncertainty in obtaining permanent housing.

Breaking out clients by different subgroup, without adjusting for the length of time that they have been engaged in the program, there is wide variation in the percent of clients in different subgroups that are housed, as shown in Figure 9. The entire population of clients represented in Figure 9 had been engaged an average of 297 days.

Forty-six percent of actively engaged clients were placed in permanent housing during the data window for the evaluation. This includes 6 percent housed in other programs along with 40 percent placed in permanent supportive housing. Among groups with at least 20 engaged clients, the rates of success in obtaining permanent housing included:

- Musculoskeletal disorder 77 percent
- Digestive disorder 63 percent
- European Americans 59 percent
- 46 years of age or older 55 percent

Groups with the lowest rate of success in obtaining housing included:

- Males 45 percent
- African American 44 percent
- Substance abuse disorder 42 percent
- 30 to 45 years of age 39 percent

The small group of actively engaged young adults 18 to 29 years of age had been engaged for an average of 192 days, but no one in this group had yet been housed.

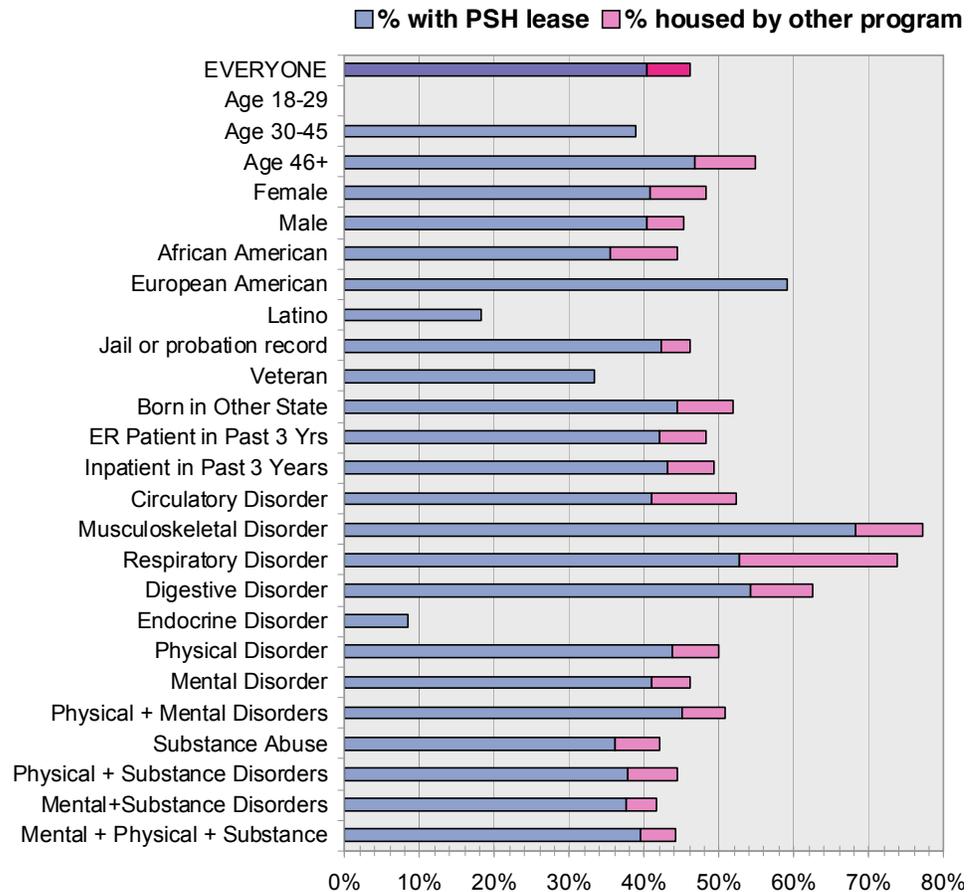
The below-average rate of 44 percent of African Americans placed in permanent housing identifies a need to learn how to engage more effectively this large group of clients. The even lower placement rate of 42 percent for persons with identified substance abuse problem identifies a need to improve capabilities for maintaining purposeful engagement with clients who have a compulsive need to use drugs.

Length of Time from Engagement to Obtaining Permanent Housing

When we breakout actively engaged individuals by the length of time they have been engaged, the picture is encouraging. Virtually everyone who remains engaged obtains permanent housing, although it sometimes takes a long time, as shown in Figure 10.

Housed and actively engaged clients are combined in Figure 10, and broken out by quarterly housing status over a two-year period. Housed individuals include those in permanent supportive housing as well as those permanently housed through other programs. For those who

Figure 9
Housing Rates for Patients in the 10th Decile Engaged by Navigators
Out of 89 persons engaged by navigators, 41 were housed during the evaluation time window



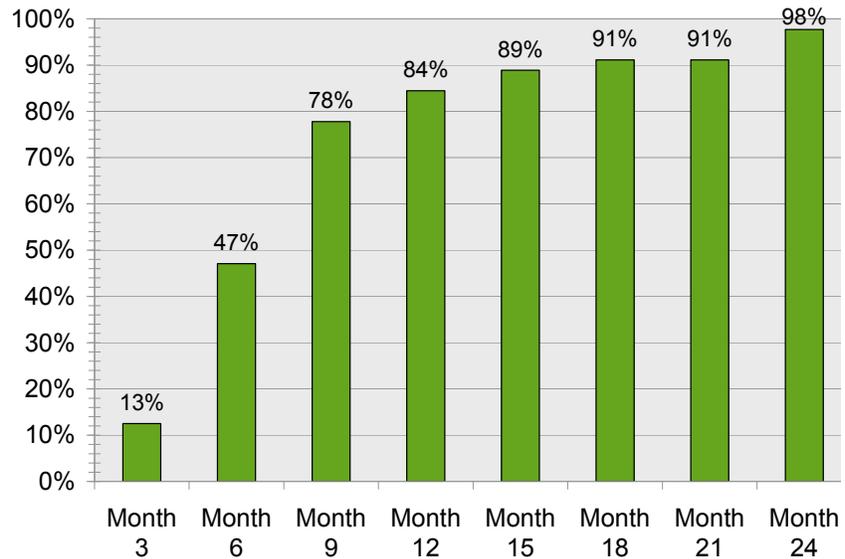
have obtained housing, the average length of time between screening and obtaining permanent housing is 190 days; the median is 162 days.

Looking at the combined population of housed and actively engaged persons, the quarterly housing status for obtaining permanent housing was:

- 13 percent housed at 3 months
- Nearly half (47 percent) housed at 6 months
- Over three-quarters (78 percent) housed at 9 months
- 84 percent housed at 1 year
- 98 percent housed at 2 years

Figure 10
Percent of Actively Engaged Patients in Permanent Housing by Number of Months Engaged in Program

36 patients were placed in PSH by FUSE/SIF, 5 patients were housed in other programs for a total of 41 housed



The issues of attrition and delay cloud the permanent housing placement results. The issue of *delay* is that the longer individuals have to wait for housing, the more tenuous their engagement is likely to become. The issue of *attrition* can be seen in Figure 8 - at the end of the evaluation window, the group of 21 engaged clients who had gone missing was almost as large as the group of 22 clients who were still engaged and waiting for permanent housing.

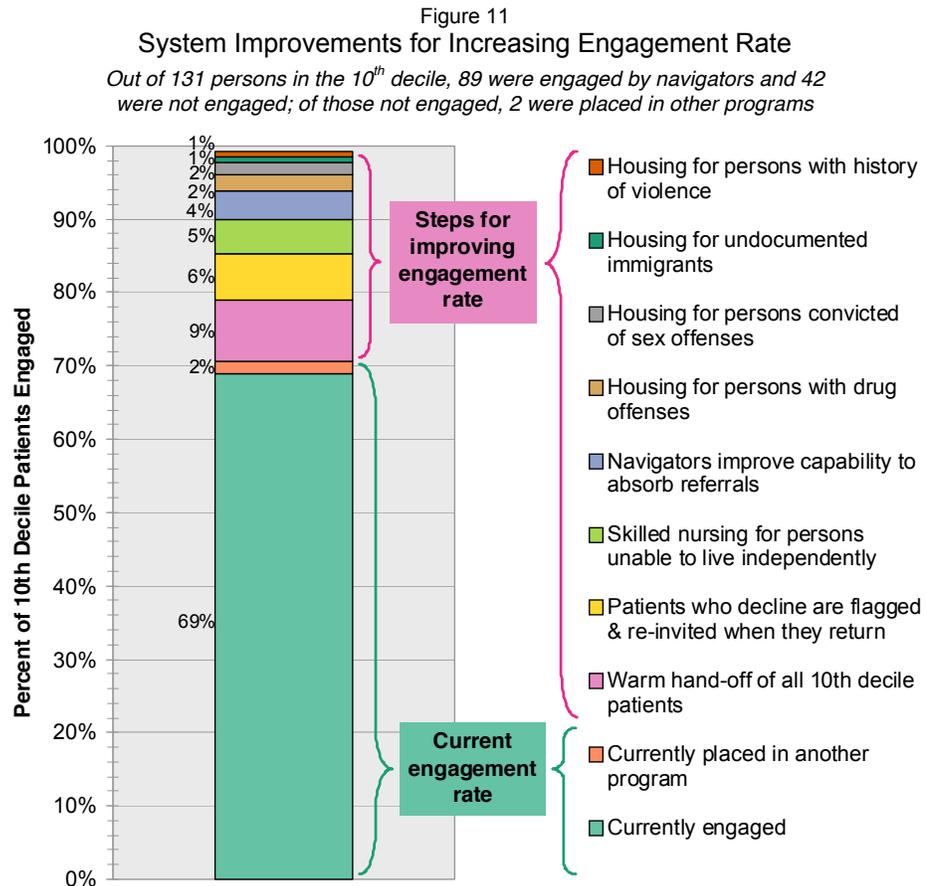
Discussion of Outcomes

Based on outcomes to-date for the population evaluated, 70 percent of the patients engaged by navigators, and about half of the total 10th decile population, are likely to be permanently housed. This is a considerable accomplishment, yet the attrition that occurred at every step in the process points to opportunities for improving the housing rate. The greatest amount of attrition occurred in the step between identifying patients in the 10th decile and engagement by navigators.

Increasing the Engagement Rate

Seventy-one percent of 10th decile patients are engaged by navigators or placed in another program. Potential steps for increasing the engagement rate are shown in Figure 11 and would have the following impacts:

- Increasing effectiveness in achieving a warm hand-off of 10th decile patients from hospitals to navigators could increase the engagement rate by 9 percentage points. This can be approached in at least two ways. One approach entails maintaining hospital contact with the patient until the navigator is present, for*



example by keeping the patient in the hospital for an additional night, providing a meal in the hospital cafeteria, or inviting the patient to wait in the social work office. Another approach is expand the time window in which navigators are available to come to hospitals, and in which temporary housing providers can admit residents so that these services are available at night and during the weekend. The necessary outcome is ensuring that the patient is personally introduced to the navigator and that the navigator is briefed on the patient's condition and needs.

- Flagging the hospital records of patients who decline to participate and encouraging them to reconsider this decision when they return to the hospital could increase the engagement rate by 6 percentage points. Often a patient's resistance to participating is based on short-term circumstances and the patient may be willing to participate the next time the invitation is extended.*
- Providing housing in skilled nursing facilities for patients who have health barriers that prevent them from living independently in permanent supportive housing could increase the engagement rate by 5 percentage points. Some of the sickest 10th decile patients lack sufficient mobility to live independently (e.g., the ability to get into bed by themselves at night), or have medical needs such as ongoing wound care that require skilled nursing care.*

- *Building collaborative capacity among navigators to shift referrals from a navigator that is at capacity and cannot accept referrals to another navigator that can accept referrals could increase the engagement rate by 4 percentage points.*
- *Creating a special set-aside for inclusionary housing by earmarking a portion of HUD-funded Shelter plus Care housing vouchers as well as Section 8 vouchers to provide rental assistance for patients who are barred from housing subsidies because of criminal offenses, or undocumented immigration status, or other reasons could increase the engagement rate by 5 percentage points.*

Increasing the Housing Rate

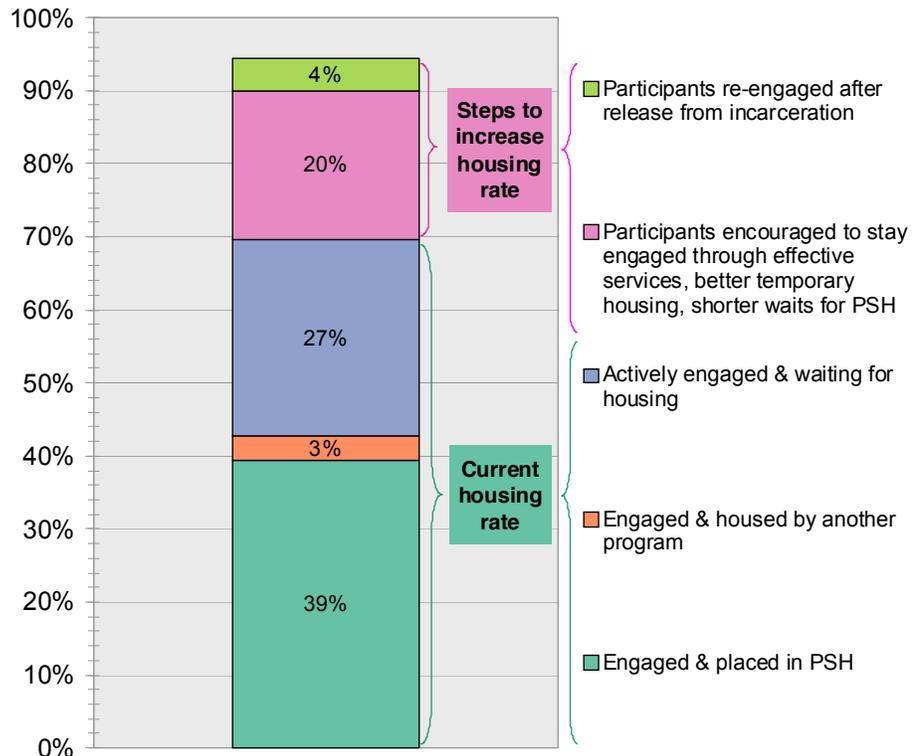
Virtually everyone who is engaged and remains engaged obtains permanent housing, however, many clients do not remain engaged. Potential steps for increasing the housing rate are shown in Figure 12.

Twenty percent of the clients who had been engaged went missing during the time window of the evaluation. Most had been diagnosed with a major mental illness and most were frequent users of hospitals. In the past two years, the 21 missing participants had visited emergency rooms an average of 25 times and spent an average of 59 days as hospital inpatients. Eliminating this

attrition would increase the housing rate by 20 percentage points. Steps include:

- Increase funding for temporary housing with private rooms, thereby making housing conditions during the waiting period more appealing.
- Increase the availability of housing subsidy vouchers and thereby reduce the

Figure 12
Steps for Increasing the Permanent Housing Rate
Out of 89 people engaged by navigators, 36 were placed in PSH and 5 were housed in other programs for a total of 41 housed



wait period for permanent supportive housing. It is very difficult to maintain active engagement with mentally ill and often dually or triply diagnosed clients when they have to wait six, nine, twelve or more months to obtain housing.

- Increase the number of project-based permanent supportive housing units outside of Skid Row that are available to 10th decile patients. Existing on-site services augmented by continuing supportive services from navigators provides the strongest support for 10th decile patients. In addition, some site-based projects have housing subsidies attached to the project, making it unnecessary to obtain a Section 8 or Shelter plus Care voucher before housing the patient.
- Notify all participating hospitals about the identities of missing clients so that they can be identified when they seek hospital care and reconnected with their navigator.

Four percent of engaged clients were incarcerated while waiting for permanent housing. Keeping places in the program open for these clients and re-engaging them when they are released will increase the housing rate by 4 percentage points.

The final six percent of engaged clients who remained unhoused were individuals who died (two other clients died after they were housed). They represent a permanent shortfall in the housing rate and a reminder of how important it is to provide housing, stability and care for sick homeless residents.

These measures for increasing engagement and retention rates will further strengthen an already effective program, and further increase the proportion of high-cost, high-need homeless hospital patients whose needs are addressed through housing rather than through emergency hospital care.

Costs Incurred and Avoided

Overview

Two sources of information were available for estimating differences in costs of 10th decile patients before and after they were screened by this project. The first and most reliable source is from cost data for statistically reliable comparison groups, one made up of similar individuals who were homeless, and another made up of similar individuals living in permanent supportive housing. The second source is from actual hospital billing records for the year preceding and the year following referral to the project.

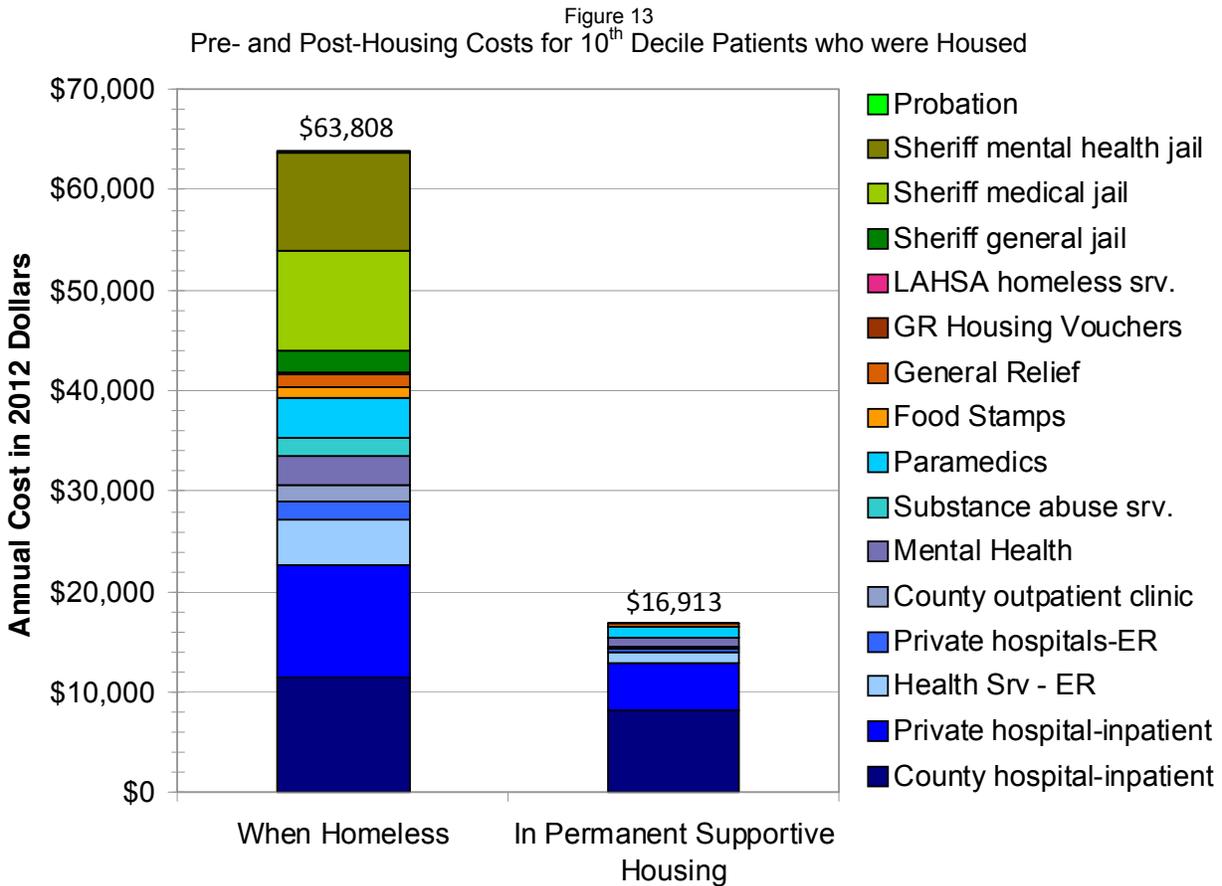
The first source of data was developed by Los Angeles County. Records for a representative sample of 9186 adults experiencing homelessness as well as for 1007 formerly homeless adults with disabilities who had obtained permanent supportive housing were linked across county departments to identify both services and costs for these individuals.⁷

A statistical procedure called propensity score matching was used to extract a subset from each of the two samples, with each subset consisting of individuals who, person-by-person, are highly similar to the 10th decile evaluation population. This procedure is explained in greater detail in the *Statistical Appendix*. With an evaluation sample of 131 persons in the 10th decile, these statistically matched proxy groups provide very good evidence of the effects of the project as measured by cost comparisons for the entire 10th decile population identified through screening, the subset of persons who were engaged, and the subset of engaged persons that had been housed.

The second source of data is billing records extracted by California Hospital Medical Center in downtown Los Angeles and Saint John's Health Center in Santa Monica that cover the year preceding and the year following referral of 32 patients to this project.⁸ These costs reflect the impact of navigator services while patients waited for permanent housing, which then typically resulted in relocation to a different community. When patients were placed in permanent housing in less than a year, their pre-housing hospital costs were annualized by increasing partial year costs to represent equivalent costs over a one-year interval. This pre-post cost data is subject to the limitation that the year preceding referral to the project may not be representative of patients' long-term hospital utilization; however, its strength is that it reports actual cost changes experienced by hospitals as a result of participating in this project.

Costs Before and After Permanent Housing based on Matched Comparison Groups

Comparison groups made up of persons for whom we have pre- and post-housing cost data and who are similar to the evaluation population were formed by identifying person-by-person matched pairs based on *propensity scores*. Matching on propensities is a powerful statistical technique that reduces multiple descriptive data on an individual to a single score – the “propensity” of that individual to belong to a specified subset of the larger group. In this case,



Source: 36 10th decile patients placed in permanent supportive housing matched with 36 homeless persons in the ALP database, matched in turn with 36 housed persons in the SRHT database of formerly homeless persons now in permanent supportive housing.

this is the subset of homeless who have achieved membership in the 10th decile evaluation population. This procedure is explained in the *Statistical Appendix*.

Propensity scores were calculated for the combined evaluation population and representative sample of 9,186 homeless persons (mentioned earlier). Then, individuals from the latter were matched to the former on the basis of propensity score. This matching process yielded 106 matched pairs of 10th decile patients in the evaluation and similar persons in the homeless database.

In turn, the process was repeated to create matched pairs of the 106 persons from the homeless database who achieved first match with similar people in the database of 1,007 formerly homeless persons now living in permanent supportive housing (PSH) for whom we have detailed cost information obtained by linking their county records. Thus, we end with 106 “triads”, each consisting of an individual from the evaluation population with unknown actual costs, a matched un-housed proxy with known costs, and a matched housed proxy with known costs.

Using this information, Figure 13 shows the estimated costs for 10th decile patients identified in this project when they are homeless and after they obtain permanent supportive

housing. These estimates are based on the subgroup of engaged patients who had been placed in permanent supportive housing as of May 2013.

The estimated average annual cost in 2012 for 10th decile patients living in permanent supportive housing was \$63,808 when they were homeless and \$16,913 after obtaining permanent supportive housing. Before taking account of costs for helping these patients make the transition from homelessness to permanent supportive housing, or supportive housing subsidies, there is an estimated annual savings of \$46,895 because of being housed and receiving supportive services. Savings come from:

- Total annual health care costs decreased from \$58,962 to \$16,474, including:
 - Hospital inpatient costs decreased from \$22,738 to \$12,981
 - Hospital emergency room costs decreased from \$6,185 to \$1,314
 - Jail mental health and medical costs decreased from \$19,646 to \$2
- Public assistance costs, including General Relief, Food Stamps and homeless services decreased from \$2,576 to \$351
- Non-medical justice system costs for general jail facilities and probation decreased from \$2,270 to \$89

The estimated pre- and post-housing costs for all 131 10th decile patients, the subset of 89 patients that navigators succeeded in engaging, and the further subset of 36 patients who had been housed as of the writing of this report are shown in Table 9 in the *Statistical Appendix*.

Estimated public costs for *engaged* patients were 1 percent lower, and for *housed* patients 5 percent lower than for the overall 10th decile group, raising the possibility those who fell through the cracks and were not housed might be slightly more intense users of public services than those who were housed.

The estimated decreased in annual public costs for *housed* patients was slightly less than the estimated potential reduction for the overall group of 10th decile patients - \$46,895 vs. \$47,977.

Post-housing cost decreases came largely from an estimated 72 percent reduction in health care costs – both in hospitals and jails.

Jail costs almost disappear when patients are living in permanent supportive housing. We see great reductions in the rate and duration of incarceration among patients who remain housed. Twenty-nine percent of patients who were screened had been in jail or on probation in the past three years. This group again made up 29 percent of those who were engaged and 31 percent of those who were housed, indicating a housing placement rate as high as for the overall project population.

Change in Hospital Use and Costs while Waiting for Permanent Housing

All of the 32 clients with hospital cost data were screened using the triage tools, found to be in the 10th decile, and engaged by a navigator. The post-referral cost data largely covered the interval when these clients maintained varying levels of engagement, with most receiving social services from navigators, including connection with outpatient medical clinics. However, for the most part, these individuals were not yet permanently housed. Among these 32 clients, an

average of 302 days of the post-referral year was spent in temporary housing and 63 days was spent in permanent housing where they could be linked with a permanent medical home.

After making an upward adjustment to hospital use during the portion of the post-referral year spent waiting for permanent housing to annualize the data, and comparing it to hospital use in the pre-referral year, we see a significant drop in hospital use in the post-referral year, as

shown in Figure 14. On an annual average per-person basis:

- Emergency room visits decreased 50 percent, from 6.0 to 3.0
- Hospital admissions decreased 71 percent, from 1.8 to 0.5
- Inpatient days decreased 84 percent, from 8.6 to 1.4.

These reductions in hospital use resulted in corresponding reductions in hospital costs for these 32 patients. On an annual average per-person basis:

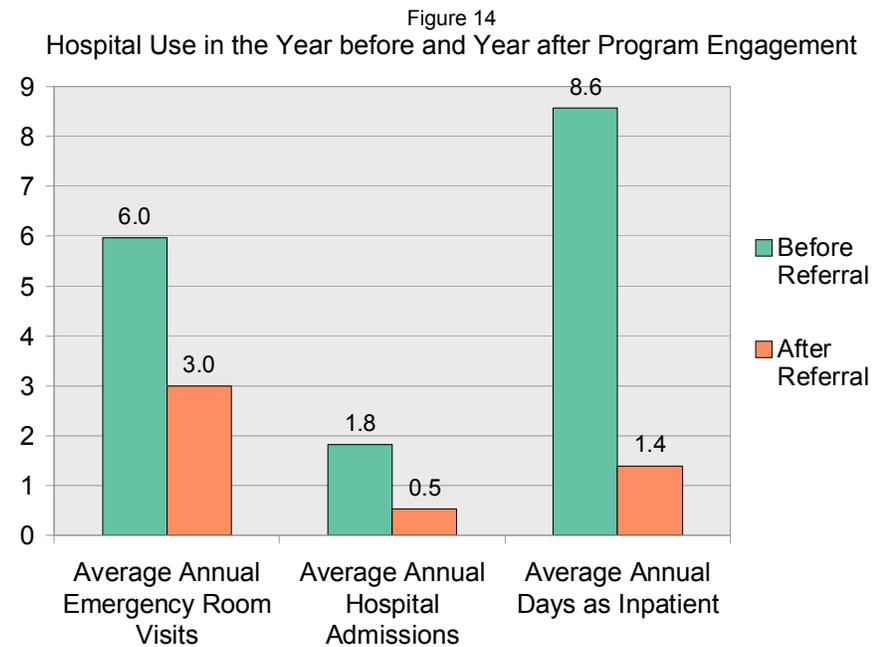
- Emergency room costs decreased 67 percent, from \$3,702 to \$1,222
- Inpatient cost decreased 68 percent, from \$13,354 to \$4,254

These pre-post cost changes suggest that even before obtaining permanent housing, social services provided by navigators and connection with outpatient health care resulted in reducing inappropriate hospital use.

Costs Incurred and Avoided by Housing 10th Decile Patients

A mosaic of subsidies is assembled to provide permanent supportive housing for individuals. This section details those subsidies with a focus on local costs, since this initiative to house high-cost homeless patients is locally driven, and looks at the bottom line financial impacts of the initiative. Annual ongoing and one-time costs to assist project participants in becoming tenants in permanent supportive housing are shown in Table 4.⁹

The annual cost for permanent supportive housing is approximately \$14,450, with roughly two-thirds of this for the capital cost of the unit and one-third for supportive services and operating costs.¹⁰ If a tenant has a Section 8 rent subsidy voucher funded by the U.S.



Encounters and costs reported by California Hospital Medical Center and Saint John's Health Center for 32 patients. Post-referral hospital use adjusted upward to represent a full year.

Table 4
Cost for 10th Decile Patients Who were Placed in Permanent Supportive Housing

Cost Category	Annual Cost - 1 Client	Annual Cost - All Clients
Ongoing Costs for Duration of Tenure in Permanent Supportive Housing		
<ul style="list-style-type: none"> Capital cost for dwelling unit, paid either at the time of construction for project-based permanent supportive housing or through monthly rent for scattered site permanent supportive housing (<i>59 estimated to be placed in PSH – 35 already housed + 24 actively engaged</i>) 	\$9,750	\$575,250
<ul style="list-style-type: none"> Operating cost for supportive services and operating costs (<i>59 estimated to be placed in PSH – 35 already housed + 24 actively engaged</i>) 	\$4,700	\$277,300
<i>Annual Rent, Supportive Service and Operating Cost</i>	\$14,450	\$852,550
Ongoing Rent Revenue for Duration of Tenure in Permanent Supportive Housing		
<ul style="list-style-type: none"> Section 8 rent subsidy voucher payment after tenant receiving Supplemental Security Income (SSI) pays 30 percent of income for rent (<i>U.S. Department of Housing and Urban Development fair housing rent amount for an efficiency unit in Los Angeles County in 2013 is \$911 per month or \$10,932 annually, minus \$3,119 paid annually by the tenant x 59 tenants</i>) 	\$7,813	\$460,967
<ul style="list-style-type: none"> Rent payments by tenant receiving Supplemental Security Income (SSI) and paying 30 percent of income for rent (<i>monthly SSI benefit is \$866.40 x 30 percent x 59 PSH tenants</i>) 	\$3,119	\$184,023
<i>Annual Income to Pay for Rent, Supportive Services and Operating Costs</i>	\$10,932	\$644,948
Annual Deficit for Rent, Supportive Services, Operating Costs	(\$3,518)	(\$207,560)
One-time Costs to Place 10th Decile Patients in Permanent Supportive Housing		
<ul style="list-style-type: none"> Training and on-site start-up assistance at hospitals (<i>\$6,000 to \$9,500 per hospital averaged over 163 patients screened plus future screening</i>) 	\$100	\$16,300
<ul style="list-style-type: none"> Hospital staff time prepare triage tool information (<i>\$100 @ x 163 patients screened</i>) 	\$100	\$16,300
<ul style="list-style-type: none"> Screening with triage tool and hospital interview (<i>\$100 @ x 163 patients screened</i>) 	\$100	\$16,300
<ul style="list-style-type: none"> Navigator services (<i>\$6,000 @ x 89 patients engaged</i>) 	\$6,000	\$534,000
<ul style="list-style-type: none"> Temporary housing (<i>\$2,250 @ x 89 patients engaged</i>) 	\$2,250	\$200,250
<ul style="list-style-type: none"> Client transportation (<i>\$200 @ x 89 patients engaged</i>) 	\$200	\$17,800
<ul style="list-style-type: none"> SSI / Medi-Cal enrollment (<i>\$500 @ x 89 patients engaged x 60 percent uninsured</i>) 	\$300	\$26,700
<ul style="list-style-type: none"> Unreimbursed medical costs (<i>\$145 @ x 89 patients engaged x 60 percent uninsured</i>) 	\$87	\$7,743
<ul style="list-style-type: none"> Move-in costs (<i>\$1,000 @ x 59 PSH tenants</i>) 	\$1,000	\$59,000
One-time Costs Averaged Over 59 Patients in Permanent Supportive Housing	\$15,159	
<i>(36 already placed and 23 actively engaged/incarcerated projected to be placed)</i>		
Total One-time Costs for 163 Patients in Evaluation		\$894,393

Department of Housing and Urban Development, the combination of the rent subsidy paid by the voucher and the rent paid by the tenant will pay for about three-quarters of the cost for the unit and supportive services. This leaves an annual deficit of \$3,518 to be recouped from other sources.

A significant one-time expenditure is required to place 10th decile patients in permanent supportive housing. This includes training hospital staff at the start of the project, and ongoing work by hospital staff to identify and screen potentially eligible patients for a total cost of about \$300 per screened patient. An additional outlay was made at two hospitals to fund dedicated internal hospital positions to interface between hospital clinical staff, social services staff and external navigators and housing providers. These positions were created to make it possible for clinical staff to identify potential patients for the program and then have the internal navigator follow up on the case without the screening and referral process increasing the workload of clinical staff. These internal hospital outlays are not included in the program costs shown in this chapter. The bottom-line financial results are shown in Table 5.

The largest cost is for the intensive, ongoing work done by navigators, at a cost of about \$6,000 for each patient that is engaged. The next largest budgeted amount was \$2,250 for temporary housing, which costs from \$35 to \$70 per night depending on the community. This is enough to pay for one to two months of temporary housing, meaning that if it takes six months to place the patient in permanent supportive housing, much of that time will be spent living in emergency shelters or on the street, contributing to client attrition.

There are additional costs for client transportation, assistance in enrolling clients in SSI and Medi-Cal, paying unreimbursed costs for clinic visits and medicine, and move-in costs totaling about \$1,587.

Table 5
Bottom Line Financial Results from the Evaluation

Category	Amount	Description
Cost Avoidance (Gross)	\$46,895	<i>in annual public costs avoided as a result of housing 10th decile patients, as shown in Figure 13, for the evaluation population that was placed in permanent supportive housing (\$63,808 in annual costs when homeless vs. \$16,913 when housed)</i>
10th Decile Program Costs	\$15,159	<i>in one-time costs to house each patient, including the first year of local subsidies for rent and supportive services</i>
	\$3,518	<i>in annual rent subsidy in the second and subsequent years, in addition to the Section 8 or Shelter plus Care rent subsidy</i>
	\$3,000	<i>in annual cost for enriched supportive services in the second and subsequent years</i>
Cost Avoidance (Net)	\$31,736	<i>in public costs avoided in the first year after paying the housing subsidy shortfall and one-time costs for housing placement, representing \$2 in public costs avoided for every \$1 spent in the first year</i>
	\$40,377	<i>in public costs avoided, after paying for local housing subsidies and enriched supportive services, in the second year and each year that follows, as long as the patient remains housed. This represents \$6 in public costs avoided for \$1 spent for housing subsidies and supportive services</i>

When all of the one-time costs paid to screen and house the 163 patients in the evaluation population are averaged over the 59 people already housed or expected to be housed, the average cost for each person housed was \$15,159.

There is an ongoing annual cost for enriched supportive services after the client has been placed in permanent supportive housing. This higher level of supportive services is needed given the high level of need among 10th decile clients and more than pays for itself through reduced use of public services and higher housing retention rates.¹¹ A reasonable estimate is that the cost for these ongoing supportive services is about half of the initial cost for navigator services to place the client in housing, or about \$3,000 per year.

If all 131 10th decile patients in the evaluation population had been engaged and housed, rather than just 59, the average first-year cost per person housed would drop by about one-third, to \$10,216.

It is important to note that avoidance of these costs is contingent on retaining people in permanent supportive housing, which is facilitated by higher rather than lower levels of on-site services, particularly given the severe problems of many individuals in the 10th decile. Continuing supportive services that are responsive to the needs of each tenant are required to keep 10th decile patients housed and to preserve the public savings that accrue from the cost and effort to house this high-need population.

Permanent supportive housing projects typically do not have enough case management funding to provide the level of supportive services needed by 10th decile patients. This means that the navigators must make an ongoing commitment to provide continuing support for patients after they are housed. This ongoing support is essential if the patients are placed in scattered-site housing, as has predominantly been the case for the evaluation population, because in that case the navigators are the only source of supportive services.

Individuals with above-average risks of leaving permanent supportive housing can be identified.¹² These high-risk groups include:

- Residents with co-occurrent mental health and substance abuse problems
- Residents who have been incarcerated
- Young adults

The 10th decile population in general and these groups in particular need a high level of ongoing support to help them be successful tenants and remain stably housed.

Chapter 5

Lessons Learned

Housing navigators and hospital staff are the center of on-the-ground learning about strengths, areas for improvement, and best practices in the 10th Decile Project. To understand their experiences, six focus groups were held; one involved hospital representatives only and the remaining five included navigators from the social service agencies. This chapter summarizes their assessments of and recommendations for the 10th Decile Project.

Overarching Themes

What's Working?

1. Client identification and engagement
 - The triage tools are simple to use and identify clients with the highest level of need.
 - Enrolling clients is easiest part, but building trust and obtaining necessary documentation and approvals requires skill, time and commitment.
 - Trusting relationships built by navigators with 10th decile clients are essential for helping clients make the transition to permanent housing.
 - A “warm handoff” from the hospital to the navigator is crucial for effective engagement with the client.

2. Service Delivery
 - Moving clients from dependence on hospitals to using outpatient clinics for primary care requires building long-term, trusting relationships between navigators, clients and supporting institutions.
 - Landlords often care about patients and are sympathetic to their special needs.
 - The commitment from navigators to provide ongoing problem-solving support for 10th decile tenants is essential for getting landlords to lease units to them; this is true for both project-based and scattered-site units.
 - Inpatient detoxification is needed before some clients can begin the transition to permanent housing.
 - Behavioral health services (mental health and substance abuse treatment) using harm reduction approach, are critical to maintaining housing.
 - Placement in stable housing helps clients see life in different way; they start to think about their future.

Continuing Challenges

1. Timely, cross-organization sharing of information
 - Complete information about client needs (sobriety, mental health, critical health care needs, prior arrest records) is critical for effective engagement.

- Adequate information is sometimes lacking about criminal history and immigration status, so major barriers to obtaining housing subsidies are not known by the navigator when the client is engaged.
 - Complete medical information can be difficult to get from hospitals at the time of screening.
 - Staff specialties within hospitals can create silos that interfere with collaboration between clinical and social work staff in identifying, screening and referring 10th decile patients.
 - Hospital and navigator priorities don't always align – workloads and work priorities of hospital staff sometimes mitigate against taking time to carry out the screening and hand-off process. The 40-hour workweek of navigators means that they are unavailable to accept referrals of 10th decile patients who come to hospitals at night or on weekends.
2. Maintaining client engagement and making a transition to permanent housing
- It is easier to work with clients who already have a relationship with the navigator agency; however, many 10th decile clients were previously disconnected from services.
 - 10th decile clients often have strong distrust of institutions and a history of negative experiences with county systems.
 - Lack of client communication tools (e.g. cell phones, access to email) often makes it difficult to maintain contact with clients.
 - Clients often have sobriety issues and navigators use a harm reduction model to minimize the harm that results from substance abuse.
 - Navigators must build concurrent collaboration with multiple social service delivery organizations (hospitals, substance abuse treatment facilities, medical clinics, mental health services, temporary housing, housing authorities, and permanent housing providers).
 - Clients often lack skills for handling meals, bills, money management and living alone; maintaining them in permanent housing requires ongoing case management.

Specific Lessons

Specific questions asked of each focus group (*in italics*) followed by summary comments of focus group members are shown below.

Screening and Recruitment

How would you assess the process of working with hospitals to screen and identify 10th Decile clients and refer them into the program?

- It is not easy for navigators and hospitals to get on the same page about referrals.

- *Navigator* – The hospital thinks it’s about being sick, but it’s really about hospital use.
- *Navigator* – We work from the ground up; we work hard, seeing patients every day to nurture relationships and get critical resources. We develop a relationship and stick with them.
- *Hospital* – The screening and hand-off takes more time than expected and often requires many repeated attempts; given the tight productivity standards for hospital social workers, it is hard to find time to screen patients and make referrals.
- *Navigator* – Sometimes patients are handed off with no discharge information; the referral should include a personal introduction, information about the patient’s personal history, a discharge report, a medical history and any needed medications.
- It is very effective when hospitals and navigators communicate the same message.
- It is hard to get data about all of the hospitals patients visit.
 - Sometimes it is also hard for hospital staff to get their own data.
- Often it is not possible to get jail data.
 - Navigators need to know that patients are not registered sex offenders and do not have a felony conviction for drug sales – if they have this in their background they can not get a Section 8 rent subsidy.
- Those who are actively intoxicated can’t stay in the hospital and have no safe/low-cost place to go for detox upon discharge.

How would you assess the triage tools as a method for identifying high-need homeless clients?

- The triage tool is simple to use and identifies patients with the highest level of need.
 - Some patients need skilled nursing; they are not healthy enough to live independently in permanent supportive housing.
 - Some patients have been kicked out of temporary housing because they were so intoxicated they created a liability risk for the housing provider.
 - Information from criminal background checks about “show stoppers” is needed at the beginning, before patients are enrolled.
 - It’s hard to find temporary housing for patients in wheel chairs.
- These are very high need patients and because of their acute medical conditions and long-standing reliance on hospitals, it takes a lot of work for the navigator to wean them off of hospitals and get them to use an outpatient clinic for primary care, even after they are housed.
 - Many patients are severely mentally ill and have acute substance abuse problems.
- There is an urgent need for inpatient medical detoxification beds – about a fifth of the 10th decile patients need immediate inpatient detoxification.

Service Delivery

How would you assess the process of getting clients into permanent supportive housing, including providing temporary housing, providing case management, meeting urgent needs, obtaining documentation, obtaining housing vouchers, and leasing permanent supportive housing units?

- Enrolling people is easy – building relationships to move forward is hard.
 - Housing is only partly effective as a motivator.
 - Untreated substance abuse and mental illness, physical illness, isolation, and skepticism all work against client engagement.
 - It is hard to maintain continuity of client engagement while obtaining all of the documentation and approvals needed for obtaining permanent supportive housing.
 - Some patients resist documenting their mental illness, making it difficult to obtain Supplemental Security Income (SSI) for them.
- Many clients are “under the radar” and unconnected to any services. Homeless service providers didn’t realize how difficult the 10th decile would be. The 10th decile clients have a strong distrust of institutions, and a history of negative experiences with county systems.
- Trusting relationships are critical to helping move clients forward; without this, many clients could easily disappear.
- It helps to have an existing relationship with the client, especially a mental health service relationship.
- The program needs a mental health/medical outreach component for engaging clients on the street.
- Some 10th decile clients need more than primary care, so it is important to keep open lines of communication and have case conferences with the hospital that referred them. Many of their specialty needs -- congestive heart failure, diabetes – are exacerbated by drug use.
- It would help to get cell phones for clients so that navigators can reach them.

How would you assess your working relationships with other organizations for carrying out this program?

- Strong service delivery alliances are essential for navigators.
 - Hospitals, substance abuse treatment, medical clinics, mental health services, temporary housing, housing vouchers, permanent housing.
- Temporary housing outside of Skid Row is hard to find and expensive.
 - Clients who are trying to remain sober do not want to stay near Skid Row, where drug use is endemic.
 - Some clients worry about being victims of crime if they stay near Skid Row.
- A private room helps keep clients engaged.

- Unless they are co-located with the supportive service provider, Federally Qualified Health Centers (FQHCs) have a small role until clients enter permanent housing. Co-located homeless service providers and FQHCs have enhanced capabilities for identifying the highest utilizers of hospitals and for building trusting relationships with both primary care physicians and patients. The education process of going to the FQHC physician instead of the emergency room can start immediately upon engagement.

Impacts

What outcomes are you seeing for clients who have been placed in permanent supportive housing? Do the placements appear to be stable? Do landlords accept these clients?

- Things really start to change when clients have permanent supportive housing.
 - There is stability and clients see life in a different way - they start thinking about their future.
 - Some clients do not know how to be “inside walls,” handle bills, cook food, and most of all, deal with the isolation of living alone. They need intensive case management focused on daily living skills – shopping, food banks, cooking, basic essentials (towels, toilet paper, dish soap), and , money management.
 - Clients start using the hospital less and connect with a FQHC.
- Landlords often care a lot about the clients and are sympathetic to their physical disabilities.
 - It is a big selling point that the clients have ongoing support from the housing navigator for solving problems and being a successful tenant.
- One client turned down PSH because he didn’t want to pay 30 percent of his income for rent.
 - Maybe clients should start contributing to rent when they go into temporary housing, with the money being saved for first and last month’s rent when they move into permanent supportive housing (OPCC already does this in its temporary housing programs).

What post-placement services are needed?

- It is important to find a doctor who is passionate about helping this population in order to establish a good health home.
 - It is very helpful to have a nurse involved in assessing the client’s needs, screening potential health care providers, and helping clients transition to a new health home.
- Navigators make a long-term commitment to keep on helping clients after they enter PSH.
- Behavioral health services (mental health and substance abuse treatment), using a harm reduction approach, are critical to maintaining housing. Often the untreated

symptoms of mental illness or substance abuse interfere with a tenant's ability to be a good neighbor, care for their unit and comply with lease obligations.

Resources

How would you assess the resources that have been available? Have they been adequate? If additional resources were needed, what type? Who should have provided them?

- Building a bridge from the hospital to permanent supportive housing costs ten to twenty thousand dollars, depending on the length of stay in temporary housing.
- Sustaining the long-term commitment to clients depends on a stable long-term funding stream for care coordination and housing placement and retention.
- Additional resources are needed for:
 - Temporary housing
 - Move-in costs, including first and last months rent
 - Furniture and household supplies
 - Medical detoxification
 - Medical and behavioral health outreach teams
 - Cell phones
- To make this model sustainable, the health care system in general and hospitals and managed care providers in particular need to reciprocate the benefits that accrue to them when high-cost patients are housed by helping to fund housing and services.

Chapter 6 Conclusions

Costs

A significant one-time expenditure of time and money is required to place 10th decile patients in permanent supportive housing, and there are smaller ongoing costs for supportive services to help these clients retain their housing. Based on outcomes currently being achieved, every \$1 dollar in local funds spent to house and support 10th decile patients is estimated to reduce public costs for 10th decile patients by \$2 in the first year and \$6 in subsequent years.

These cost reductions are contingent on placing and retaining people in permanent supportive housing, which is facilitated by higher rather than lower levels of on-site services. Enriched supportive services are critically important for helping individuals become and remain successful tenants given the severe problems of many individuals in the 10th decile.

Permanent supportive housing projects typically do not have enough case management funding to provide the level of supportive services needed by 10th decile patients. This means that the navigators must make an ongoing commitment to provide continuing support for patients after they are housed.

Ongoing support is especially critical when patients are placed in scattered-site housing, as has predominantly been the case for the evaluation population, because in that case the navigators are the only source of basic supportive services.

If all 10th decile patients in the evaluation population had been engaged and housed, the average first-year cost per person housed would drop by about one-third, reducing public costs by \$3 for every \$1 spent in the first year. In order to achieve this increased efficiency it is necessary to increase both the engagement rate and the housing placement rate for 10th decile patients.

Increase the Housing Supply

The most difficult problem facing the 10th Decile Project is lack of access to project-based permanent supportive housing and the extended delays in obtaining housing subsidy vouchers that enable patients to pay rent in either project-based or scattered-site housing. This resulted in six-month waits for permanent housing at the outset of the project, and these waits have lengthened since the onset of federal budget sequestration. The long waits drive up the cost of temporary housing; at \$70 a night, six months of temporary housing costs \$12,600. Because navigators do not have this much money to spend on temporary housing, it becomes necessary for many clients to spend much of their waiting interval living on the street or in emergency shelters. This drives up the attrition rate and results in fewer clients being housed.

The local policy dimension of this problem is that there is not a guiding consensus about which residents should have first priority for obtaining housing vouchers. An underlying premise of the 10th Decile Project is that homeless residents with the highest public costs should have very high priority for access to permanent supportive housing and vouchers for Section 8 and Shelter plus Care rent subsidies. This is corollary to the link between public costs for

homelessness and public underwriting of subsidized housing, as well as of the link between high public costs and high levels of physical and mental distress experienced by 10th decile patients. Philanthropic and public organizations with responsibility for ending homelessness should adopt public costs as a primary criterion for prioritizing access to housing subsidies.

Broad housing solutions are needed that draw on all locally controlled housing resources to increase the supply of housing for 10th decile patients and reduce the waiting time for moving into that housing. The following actions are recommended:

- *Make more existing project-based permanent supportive housing units available to 10th decile renters.* This can be accomplished by building long-term collaboration between permanent supportive housing providers, navigator organizations and funders of navigator services so that housing providers can have a high level of confidence that navigators will continue to provide intensive case management and supportive services for these high-need tenants on a long-term basis.
- *Convert tenant-based Section 8 vouchers into project-based vouchers that will be used to convert existing rental complexes into project-based permanent supportive housing sites.* Public housing authorities are allowed to commit up to 20 percent of their vouchers for project-based vouchers whose use is restricted to specific apartment complexes. These project-based commitments are a bankable asset that can be used as collateral for real estate financing. The City and County of Los Angeles have committed only a small share of their Section 8 vouchers for project-based use. Both have the authority to commit thousands of additional vouchers to provide long-term commitments of rental subsidies for new project-based permanent supportive housing. This includes converting existing rental housing to permanent supportive housing. The City and County Housing Authorities should work together with permanent supportive housing providers and navigator organizations to identify existing rental housing that is appropriate for permanent supportive housing and bundle vouchers to provide the financial backbone converting these sites to permanent supportive housing, with 10th decile patients making up a significant share of the new tenants.¹³
- *Make 10th decile individuals a top priority for tenant-based housing subsidy vouchers.* A limitation in the program design of the FUSE and SIF 10th Decile Project has been the use of tenant-based Section 8 vouchers as the primary housing tool. The two steps described above will create a broader portfolio of housing for 10th decile tenants. However, there will continue to be a need for tenant-based Section 8 and Shelter plus Care vouchers to subsidize rent at the preponderance of project-based permanent supportive housing sites that do not have permanent rental subsidies attached to the units as well as for scattered-site housing. Tenth decile tenants should be a top priority for receiving tenant-based Section 8 and Shelter plus Care vouchers from housing authorities.
- *Provide inclusive housing for 10th decile patients with barriers to obtaining housing.* Five percent of 10th decile patients have a criminal background or immigration status that prevents them from obtaining housing subsidies from the City or County of Los Angeles. Failure to address the housing needs of these individuals is counter to the public interest

because it perpetuates high public costs for their continuing crises. Housing provided for 10th decile individuals should not include any locally imposed restrictions on criminal background that go beyond those required by HUD. Additionally, there should be alternative housing provided for the two or three percent of clients that are sex offenders or undocumented immigrants.

- *Create an ongoing funding source for affordable housing.* Funding for development of affordable housing, including permanent supportive housing, has dropped precipitously as a result of the elimination of redevelopment agencies and the steady decline in federal funding for housing. Ongoing revenue sources such as housing impact fees for new development or real estate transfer fees should be approved to provide substantial, reliable funding for increasing the supply of affordable housing.

Increasing the Engagement Rate

Seventy-one percent of 10th decile patients in the evaluation population were engaged by navigators or placed in another program. The breakout in Chapter 3 of reasons for non-engagement identifies factors that can be addressed to engage some of the subgroups of 10th decile patients who have been left out of the project. Addressing these factors will have the following impacts:

- *Increasing the effectiveness of hospitals and navigators in achieving a warm hand-off of 10th decile patients will reduce or eliminate the 9 percent of 10th decile patients who are “no shows” and could raise the engagement rate by as much as 9 percentage points.* One approach is for hospitals to maintain contact with 10th decile patients until the navigator is present, for example by keeping the patient in the hospital for an additional night, providing a meal in the hospital cafeteria, or inviting the patient to wait in the social work office. Another approach is expand the time window in which navigators are available to come to hospitals, and in which temporary housing providers can admit residents so that these services are available at night and during the weekend.
- *Flagging the hospital records of the 6 percent of 10th decile patients who decline to participate and encouraging them to reconsider this decision when they return to the hospital could raise the engagement rate by as much as 6 percentage points.* Often a patient’s resistance to participating is based on short-term circumstances and the patient may be willing to participate the next time the invitation is extended.
- *Providing housing in recuperative care or skilled nursing facilities for the 5 percent of 10th decile patients who have health barriers that prevent them from living independently in permanent supportive housing could raise the engagement rate by as much as 5 percentage points.* Some of the sickest 10th decile patients lack sufficient mobility to live independently (e.g., the ability to get into bed by themselves at night), or have medical needs that require skilled nursing care while they recuperate sufficiently to live independently.
- *Building collaborative capacity among navigators to shift referrals from a navigator that is at capacity and cannot accept referrals to another navigator that can accept referrals could raise the engagement rate by as much as 4 percentage points.*

- *Increasing the supply of inclusive housing for 10th decile patients with a criminal background or immigration status that is a barrier to housing (as previously recommended) could raise the engagement rate by as much as 5 percentage points.*

Increasing the Housing Rate

Virtually everyone who is engaged and remains engaged obtains permanent housing, however, some clients do not remain engaged. Steps for increasing the housing rate include:

Twenty percent of the clients who had been engaged went missing before they obtained permanent housing. Most had been diagnosed with a major mental illness and most were frequent users of hospitals. Eliminating this attrition could raise the housing rate by **20** percentage points. Steps include:

- Increase the availability of permanently affordable housing with supportive services as recommended above, thereby reducing the wait period for permanent housing. It is very difficult to maintain active engagement with mentally ill and often dually or triply diagnosed clients when they have to wait six, nine or twelve months to obtain housing.
- Increase funding for temporary housing with private rooms, thereby making housing conditions during the waiting period more appealing.
- Notify all participating hospitals about the identities of missing clients so that they can be identified when they seek hospital care and reconnected with their navigator.

Four percent of engaged clients were incarcerated while waiting for permanent housing. Keeping places in the program open for these clients and re-engaging them when they are released could raise the housing rate by as much as **4** percentage points.

These measures for increasing engagement and retention rates will further strengthen an already effective program, and further increase the proportion of high-cost, high-need homeless hospital patients whose needs are addressed through housing rather than through emergency hospital care.

System Improvements

Fund Housing Navigation and Post-housing Supportive Services

Funding for the FUSE project fell somewhat short, and for the SIF project substantially short, of actual costs to house 10th decile patients. In the case of FUSE, this was caused by the extended stays in temporary housing while waiting for permanent housing. In the case of SIF, the shortfall was caused by reduced funding for housing placements as well as by extended stays in temporary housing. In the case of both programs, the shortfall in funding was offset by other resources leveraged by the navigator agencies, and when those resources were insufficient, by terminating funding for temporary housing before clients obtained permanent housing. Looking to the future, there is no identified underwriting for ongoing supportive services for clients that have been placed in permanent housing other than the moral commitment by the housing navigators implementing this project.

AB361, the “Health Homes” bill now moving through the California State Senate, would utilize a federal option in the Affordable Care Act to provide health home services for key patient populations, including frequent hospital users and chronically homeless Medi-Cal beneficiaries. Health homes is a service delivery model supporting care coordination and related supports for individuals with chronic conditions, including those with mental and substance use disorders. Eligible providers include primary care practices, federally quality health centers, community mental health organizations, addiction treatment providers, health home agencies, and other provider groups.

It is important to explore using funding from the Affordable Care Act to underwrite some of the costs for providing housing and supportive services to high-need homeless patients. Possible ways to use this funding include social impact models in which payment is linked to outcomes, workforce development for new types of front-line staff such as community health workers, and contracted rates with managed care plans and accountable care organizations for case management of 10th decile tenants.

Public and foundation funding for housing navigation services should be expanded, with concurrent commitments to fund ongoing post-housing supportive services. If AB361 passes, navigators, hospitals, and Medi-Cal managed care providers should jointly assess how to utilize Health Homes funding to support chronically homeless 10th decile patients.

Hospital Underwriting of Housing, Case Management and Housing Navigation Costs

Hospitals are the primary financial beneficiaries when 10th decile patients are housed. Avoided emergency room and inpatient costs help hospitals reduce their unreimbursed outlays for patient care. In addition to financial benefits, the 10th Decile Project increases hospitals’ quality of care through a stronger continuity of care from hospital to community. Hospitals have confidence that chronically homeless, complex patients get the care they need, reduce their risk of discharges to the street, and ultimately, reduce readmissions to emergency rooms and significantly decrease hospital inpatient days. Finally, hospitals may see efficiency improvements over time, including more appropriate use of emergency room space and more efficient use of hospital social workers and discharge planners.

At this point, however, much of the costs avoided by hospitals are “soft savings.” Hospital inpatient reductions for the population in this study were offset as beds and services were utilized by with other indigent patients. Hospitals are not yet seeing an improvement in reimbursement for their costs or a reduced number of indigent patients.

The 10th Decile Project needs to be brought to scale so that there is a discernable reduction in the size of the unhoused 10th decile patient population. **Providing permanent housing with supportive services to several thousand 10th decile patients will make a striking reduction in the number of chronically homeless patients seen in hospitals, with tangible savings in hospital costs.** When this is achieved, avoided costs will become tangible savings for hospitals. Hospitals need to make evidence-based decisions to become partners in bringing the 10th Decile Project to scale. The two key pieces of evidence are: 1) the 10th decile population is comparatively small – it is feasible to shrink the size of the unhoused segment of this population; and 2) there are dramatic reductions in health care costs for 10th decile patients when they are stably housed with supportive services.

Table 6
Hospital Funding for Housing High-Need Homeless Patients

Hospital Financial Support

1. Los Angeles County Department of Health Services - Partnered with the Housing Authority of the City of Los Angeles to acquire and rehabilitate properties totaling 70 scattered site units to provide permanent supportive housing opportunities for homeless individuals with a chronic illness or physical disability. The department awarded a five-year, \$1,879,080 contract to Housing Works to provide intensive case management services for tenants, including screening applications for housing. As the number of units increases, the contract amount will increase.
2. Saint John's Health Center - \$150,000 grant to OPCC for the Project HEARTH health care collaborative and FUSE/SIF.
3. Kaiser Permanente Los Angeles Medical Center - \$45,000 funding to PATH to engage, assist and house homeless patients.
4. Dignity Health - \$10,000 grant to CSH to support the Social Innovation Fund (SIF) project at California Hospital Medical Center and Glendale Memorial Hospital, and a \$2 million loan to CSH for construction of permanent supportive housing.
5. Huntington Memorial Hospital - \$5,000 grant to Housing Works to support the Social Innovation Fund (SIF) project.

Six of the eleven hospitals that referred the patients in the evaluation population are demonstrating reciprocity by directly helping to underwrite the costs for housing navigation or for development of permanent supportive housing. However, levels of support vary widely among hospitals, and nearly half of the hospitals do not currently provide any financial support. Support provided by the five hospitals is shown in Table 6.

Navigators, hospitals, and Medi-Cal managed care providers should jointly assess the savings that accrue to hospitals from housing 10th decile patients and identify a feasible and equitable level financial reciprocity for hospitals. Hospitals and managed care providers that avoid costs by referring 10th decile patients to housing navigators should be financial partners in helping underwrite the costs of these services.

Screening Hospital Databases to Flag 10th Decile Patients

The next step in integrating cost avoidance through housing with the health care system is to use the triage tool to screen complete hospital databases so that 10th decile patients can be immediately identified and flagged for services when they return to the hospital. This will identify many more 10th decile patients, reduce current costs for individual patient screening, and allow more time for a warm hand-off to navigators, and for navigators to engage the patients successfully.

Hospitals should collaborate with the 10th Decile Project to screen all homeless patients in their databases in order to address systematically the problem of homeless patients who are frequent users of emergency health care services as well as to achieve system wide cost reductions by housing these patients.

Sharing Records of Homeless Patients among Hospitals

Homeless patients often seek care from multiple hospitals, leaving only a partial picture of their overall level of service at each hospital. Integrating health care records for homeless patients will improve their quality of care and also make it feasible to identify more 10th decile users of hospital services. For example, there are 14 hospitals located within 5 miles of downtown Los Angeles, with significant overlap among homeless patients seen by these hospitals. This record integration will need to be carried out in a way that does not violate patient privacy.

Hospitals in proximity to each other should integrate data for homeless patients and screen these integrated records to identify 10th decile individuals.

Next Steps

This evaluation provides a snapshot of the demonstration phase of the 10th Decile Project. The second year of Social Innovation Funding for the project is getting underway as this report is completed, with a focus on finding permanent housing for 10th decile patients that have been engaged. The project is underway or starting up at ten additional hospitals not covered by this evaluation.

The next phase of the 10th Decile Project will address the recommendations in this evaluation including increasing the availability of permanent housing, expanding the base of financial support, and bringing the project to scale.

Statistical Appendix

Information about public costs for the FUSE (Frequent User System Engagement) and SIF (Social Innovation Fund) clients when they were homeless compared to when they were housed is very valuable for assessing bottom line outcomes from the 10th Decile Project. Since we are not able to obtain records from every public agency and hospital that has assisted these individuals, our best alternative is to use information for other individuals whose public costs are known, and to project their cost data to the FUSE/SIF clients in this study.

However, given that the selection of FUSE/SIF clients for this project is not random, the demographic and health profile of participants may vary systematically from the population for which we have cost information in ways that confound (or bias) the measurement of program effects. The solution is to assemble comparison groups of adults who experienced homelessness and for whom we have cost data and who collectively resemble (i.e., “are balanced with”) the clients in this study with respect to the confounding characteristics, or “covariates.”

This was done by creating what is called “propensity scores” for FUSE/SIF clients as well as two populations for which we have cost data:

1. 9,186 General Relief recipients with documented episodes of homelessness who are representative of the adult homeless population in Los Angeles County. Cost and service records for these individuals were linked across county departments through Los Angeles County’s Adult Linkage Project (ALP). The linked records for 2,907 of these individuals included medical diagnostic and hospital usage information. This subset of individuals for whom we have health system information was used to identify a comparison sample of unhoused individuals who closely resemble FUSE/SIF clients.
2. 1,007 formerly homeless individuals who exited homelessness by entering permanent supportive housing (PSH) provided by Skid Row Housing Trust (SRHT). Cost and service records for these individuals were linked across county departments through the joint efforts of the Economic Roundtable and Los Angeles County’s Chief Executive Office.

A propensity score is the predicted probability of membership in a specified subset of the analysis sample, and results from submitting the sample to a logistic regression of membership (yes/no) versus a set of dependent variables (i.e., covariates) thought to be relevant to the membership question. Generally, covariates of interest are those that would influence selection into membership and/or would influence program outcomes of membership, but covariates that were themselves affected by the program (FUSE/SIF) were excluded. At the same time, multi-collinearities among covariates that would result in a statistically unstable model were sought out and avoided. These guidelines governed specification of covariates for the regression models. Traditional measures of fit were of less interest, and in fact, it was important that the models not be too “well-fit”; if a model is too predictive, all of the high propensity scores will be in the membership group and it will not produce a distribution of scores that enables close matches between members and non-members.

Matching on propensity scores is a powerful statistical technique usually employed for setting up experiment comparisons. The idea is that if you match a program participant and a

non-participant who share the same propensity, you in effect have an approximate match with respect to the covariates that are important for isolating program effect. Not only will the participants and matched non-participants resemble each other collectively, but also the one-to-one matching enables matched-pair analysis, which often is statistically more efficient than group comparisons.

As noted above, our use of propensity score matching was a multi-step process. From the matching we sought to obtain proxy cost data for the FUSE/SIF clients who were screened and found to be in the 10th cost decile, and out of this also to have cost data for the subset of clients that was engaged, and the subset that was housed.

Two sets of propensity score matches were created. For the first set, propensity scores were created by applying logistic regression to the combined population of FUSE/SIF clients and those in the ALP population with health system information, with project “participation” (“yes” or “no”) as the dependent variable, and the covariates as independent variables. Predicted probabilities, or propensity scores, are a standard output of logistic regression. The ALP comparison group identified through this matching process provided information about the likely public costs for FUSE/SIF clients when they were homeless.

The second set of propensity score matches was similarly created between persons in the ALP population who achieved first match (i.e., with FUSE/SIF clients) and the SRHT population. This second set of ALP-SRHT matches provided information about the likely public costs for FUSE/SIF clients when they were housed.

The matching was accomplished by computer routine that first lists each of the two groups in descending order by propensity score, then, working down the two lists, “nearest neighbors” were matched subject to two constraints: (1) each case was limited to a single match (“no replacement” avoided the possibility that outliers would have disproportionate influence); and (2) the propensity scores of any match could differ by no more than 0.20 (any FUSE/SIF case not within caliper = 0.20 went un-matched).

The net effect of using “no replacement” and the caliper was that 23 records of 10th decile patients in the FUSE/SIF population did not have matches in either the FUSE/SIF to ALP match, or the ALP to SRHT match and were not represented in the cost data. These were FUSE/SIF records with the highest propensity scores, and there were not comparably high scores in the ALP or SRHT records that could be matched with them.

Table 7 provides regression specifications for propensity score matches between FUSE/SIF ALP records, as well as the follow-on match between ALP and SRHT records. Also provided are percentages of cases represented by the specified variables in each of the samples that were matched. Note that 111 matched pairs were achieved for FUSE/SIF-ALP, but this number decreased to 108 for ALP-SRHT.

After matching was completed, two clients were found to have duplicate records because each had been screened twice at different times. With the duplicate records removed, 106 matched pairs with both pre- and post-housing cost data remained for analysis.

Table 7
Regression Specifications and Composition of Matched Samples

Variables	FUSE/SIF AND ALP MATCH 111 matches			ALP AND SRHT MATCH 108 matches		
	Specified Variable	Percent with specified condition		Specified Variable	Percent with specified condition	
		FUSE/SIF	ALP		ALP	SRHT
Female	x	32%	25%	x	26%	28%
Age 18 to 29	x	3%	8%	x	8%	3%
Age 30 to 45	x	15%	15%	x	16%	18%
African American	x	47%	42%	x	43%	52%
Disabled	x	86%	80%			
ER in past 3 years	x	92%	95%			
Inpatient in past 3 years	x	90%	81%			
Substance abuse				x	62%	71%
Chronic medical condition				x	85%	83%
Infectious disease	x	7%	14%			
HIV disease				x	6%	6%
Neoplasm	x	1%	2%			
Endocrine/metabolic disorder	x	8%	9%	x	8%	6%
Diabetes	x	14%	8%			
Disease of the blood				x	4%	2%
Mental disorder				x	51%	31%
Alcohol induced mental illness	x	7%	5%			
Schizophrenia	x	29%	14%			
Mood disorder	x	9%	18%			
Nervous system disorder	x	19%	15%	x	16%	20%
Circulatory system disorder				x	42%	35%
Hypertension	x	36%	30%			
Vein/lymphatics disease	x	8%	11%			
Asthma				x	7%	6%
Digestive disorder				x	19%	19%
Genitourinary disorder				x	13%	11%
Urinary disease	x	1%	5%			
Skin/subcutaneous disorder	x	9%	13%			
Musculoskeletal disorder				x	27%	30%
Injury/poisoning	x	5%	20%			
Ill-defined condition	x	10%	27%			

Table 8
Breakout of Evaluation Population by Group Size

	Number Screened	In 10th Decile	Engaged	PSH Lease	Housed through another program
EVERYONE	163	130	89	36	5
Age 18-29	14	12	9	0	0
Age 30-45	38	29	18	7	0
Age 46+	111	89	62	29	5
Born in Other State	49	37	27	12	2
Born in Other County	11	9	6	1	0
Language not English	5	3	2	1	0
Female	47	36	27	11	2
Male	116	94	62	25	3
African American	70	65	45	16	4
European American	37	29	22	13	0
Latino	25	19	11	2	0
Asian/Pacific Islander	5	4	2	1	0
Other Ethnicity	7	4	4	3	0
Unknown Ethnicity	19	9	5	1	1
Jail or probation record	47	39	26	11	1
Veteran	10	9	6	2	0
ER Patient in Past 3 Yrs	152	121	83	35	5
Inpatient in Past 3 Years	127	113	79	34	5
Circulatory Disorder	66	55	44	18	5
Musculoskeletal Disorder	46	30	22	15	2
Respiratory Disorder	37	26	19	10	4
Digestive Disorder	37	32	24	13	2
Endocrine Disorder	24	18	12	1	0
Physical Disorder	146	114	80	35	5
Mental Disorder	127	104	78	32	4
Physical + Mental Disorders	110	88	69	31	4
Substance Abuse	87	75	50	18	3
Physical + Substance Disorders	78	66	45	17	3
Mental + Substance Disorders	77	68	48	18	2
Mental + Physical + Substance	68	59	43	17	2

Table 9
 Estimated Pre- and Post-Housing Costs for Screened, Engaged and Housed Patients in the 10th Decile
Estimated costs are for one year and are shown in 2012 dollars

	ALL 10th DECILE		ALL ENGAGED		ALL IN PSH	
	When Homeless	In PSH	When Homeless	In PSH	When Homeless	In PSH
County hospital-inpatient	\$16,948	\$6,458	\$16,140	\$5,220	\$11,555	\$8,246
Private hospital-inpatient	\$14,453	\$6,241	\$13,894	\$3,490	\$11,183	\$4,736
County hospital - ER	\$4,529	\$1,359	\$4,566	\$968	\$4,450	\$969
Private hospitals - ER	\$1,667	\$506	\$1,687	\$360	\$1,735	\$344
County outpatient clinic	\$1,806	\$822	\$1,459	\$502	\$1,771	\$238
Mental Health	\$3,630	\$931	\$4,635	\$779	\$2,810	\$931
Substance abuse services	\$1,268	\$178	\$1,371	\$191	\$1,834	\$41
Paramedics	\$4,083	\$1,370	\$4,080	\$909	\$3,978	\$967
Food Stamps	\$1,354	\$416	\$1,259	\$396	\$1,135	\$104
General Relief	\$1,749	\$694	\$1,644	\$571	\$1,195	\$247
GR Housing Vouchers	\$212	\$0	\$198	\$0	\$247	\$0
LAHSA homeless services	\$7	\$0	\$3	\$0	\$0	\$0
Sheriff general jail	\$1,882	\$120	\$1,572	\$178	\$2,131	\$50
Sheriff medical jail	\$6,652	\$236	\$8,670	\$378	\$9,892	\$2
Sheriff mental health jail	\$7,007	\$0	\$5,542	\$0	\$9,754	\$0
Probation	\$129	\$68	\$107	\$60	\$139	\$39
TOTAL COST	\$67,376	\$19,399	\$66,828	\$14,002	\$63,808	\$16,913

Source: 106 10th decile patients matched with 106 homeless persons in the ALP database, matched in turn with 106 housed persons in the SRHT database of formerly homeless persons now living in permanent supportive housing; a subset made up of 66 10th decile patients who were engaged by navigators; and a further subset of 36 patients placed in permanent supportive housing.

10th Decile Screening Form for Homeless Patients

Patient Name: *Leave Blank when De-identified* Date of Birth: _____ Place of Birth: _____
Staff Name: _____ Today's Date: _____ Hospital/Clinic: _____
Staff Phone: _____ Patient Room/Location: _____

I. Eligibility

Is this patient homeless? Yes No Don't Know

A person who is homeless lacks a fixed, regular, and adequate nighttime residence; and has a primary nighttime residence that is:

- A supervised publicly or privately operated shelter designed to provide temporary living accommodations (including welfare/voucher hotels or shelters, designed for homeless persons); or
- A public or private place not designed for, or ordinarily used as, a regular sleeping accommodation for human beings (street, park, hallway, freeway underpass, car)

Individuals are ineligible for permanent supportive housing (and this project) if any of the following attributes apply to them. Do any of the following describe this patient:

- | | | |
|----------------------------------------------------------------------|------------------------------|-----------------------------|
| 1. Undocumented immigrant? | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| 2. On parole for a violent crime? | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| 3. Convicted of arson? | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| 4. Convicted of operating a methamphetamine lab? | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| 5. Committed an offense that requires registering as a sex offender? | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| 6. Needs continuing nursing care? | <input type="checkbox"/> yes | <input type="checkbox"/> no |

If none of the above attributes apply to the patient, please continue by providing the following information.

II. General Information

Gender?	<input type="checkbox"/> Male <input type="checkbox"/> Female	Ethnicity?	<input type="checkbox"/> African American <input type="checkbox"/> Asian <input type="checkbox"/> Caucasian <input type="checkbox"/> Latino <input type="checkbox"/> Pacific Islander <input type="checkbox"/> Other _____
Language?	<input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Other _____		
Veteran?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	Alcohol or drug dependency?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know

III. Diagnostic Information

Instructions: Please review the patient's medical records and check () all diagnoses that apply. Check only the diagnoses in **bold** with check boxes next to them; the others are for reference.

Once completed, please email or fax [fax number screener] this form to [name of organization].

<input checked="" type="checkbox"/>	Group	Sub-Group	ICD-9-CM Code and Name of Principal Diagnosis	Version of Triage Tool	Chronic
<input type="checkbox"/>	1.		INFECTIOUS AND PARASITIC DISEASES (001-139)	2	
<input type="checkbox"/>			011 Pulmonary Tuberculosis	*	*
<input type="checkbox"/>			042 Human Immunodeficiency Virus (HIV) Infection	2	c
<input type="checkbox"/>	2.		NEOPLASMS (140-239)	2	c
<input type="checkbox"/>	3.		ENDOCRINE, NUTRITIONAL AND METABOLIC DISEASES, & IMMUNITY DISORDERS (240-279)	2	
<input type="checkbox"/>			250 Diabetes mellitus	2	c
<input type="checkbox"/>	4.		DISEASES OF THE BLOOD AND BLOOD-FORMING ORGANS (280-289)	2	c
<input type="checkbox"/>	5.		MENTAL DISORDERS (290-319)	1	2
<input type="checkbox"/>			Psychoses (290-299)	1	
			<i>Organic Psychotic Conditions (290-294)</i>		
<input type="checkbox"/>			291 Alcohol-induced mental disorders	1	2 c
<input type="checkbox"/>			292 Drug-induced mental disorders	1	2 c
<input type="checkbox"/>			Other Psychoses (295-299)		c
<input type="checkbox"/>			295 Schizophrenic disorders	2	c
<input type="checkbox"/>			296 Episodic mood disorders	2	c
<input type="checkbox"/>			298 Other nonorganic psychoses	2	c
<input type="checkbox"/>			Neurotic Disorders, Personality Disorders, & Other Nonpsychotic Mental Disorders (300-316)	1	
			<i>300 Anxiety, dissociative and somatoform disorders</i>		c
<input type="checkbox"/>			303 Alcohol dependence syndrome	2	c
<input type="checkbox"/>			304 Drug dependence	2	c
			<i>305 Nondependent abuse of drugs</i>		c
			<i>309 Adjustment reaction</i>		c
<input type="checkbox"/>			311 Depressive disorder, not elsewhere classified	2	c
			<i>Mental Retardation (317-319)</i>		c
<input type="checkbox"/>	6.		DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS (320-389)	1	2
			<i>Hereditary & Degenerative Diseases of the Central Nervous System (330-337)</i>		c
			<i>Pain (338)</i>		
			<i>338 Pain, not elsewhere classified</i>		c
			<i>Other Disorders of the Central Nervous System (340-349)</i>		
			<i>345 Epilepsy & Recurrent Seizures</i>		c
			<i>Disorders of the Eye And Adnexa (360-379)</i>		
			<i>368 Visual Disturbances</i>		
			<i>372 Disorders of Conjunctiva</i>		
			<i>Diseases of the Ear And Mastoid Process (380-389)</i>		
			<i>380 Disorders of external ear</i>		
<input type="checkbox"/>	7.		DISEASES OF THE CIRCULATORY SYSTEM (390-459)	1	2
<input type="checkbox"/>			Chronic Rheumatic Heart Disease (393-398)		
<input type="checkbox"/>			Hypertensive Disease (401-405)	1	2
			<i>401 Essential hypertension</i>		c
			<i>403 Hypertensive chronic kidney disease</i>		c
<input type="checkbox"/>			Ischemic Heart Disease (410-414)	2	
			<i>410 Acute myocardial infarction</i>		c
			<i>411 Other acute and subacute forms of ischemic heart disease</i>		c
			<i>414 Other forms of chronic ischemic heart disease</i>		c
			<i>Diseases of Pulmonary Circulation (415-417)</i>		
<input type="checkbox"/>			Other Forms of Heart Disease (420-429)	2	
<input type="checkbox"/>			427 Cardiac dysrhythmias	*	* c
			<i>428 Heart failure</i>		c
			<i>Cerebrovascular Disease (430-438)</i>		c
			<i>Diseases of Arteries, Arterioles, & Capillaries (440-449)</i>		c
<input type="checkbox"/>			Diseases of Veins & Lymphatics, & Other Diseases of Circulatory System (451-459)	2	

<input checked="" type="checkbox"/>	Group	Sub-Group	ICD-9-CM Code and Name of Principal Diagnosis	Version of Triage Tool	Chronic
<input type="checkbox"/>			453 Other venous embolism and thrombosis	*	*
<input type="checkbox"/>	8. DISEASES OF THE RESPIRATORY SYSTEM (460-519)			1	2
<input type="checkbox"/>		Acute Respiratory Infections (460-466)			2
		<i>462 Acute pharyngitis</i>			
		<i>465 Acute upper respiratory infections of multiple or unspecified sites</i>			
		<i>466 Acute bronchitis and bronchiolitis</i>			
<input type="checkbox"/>		Other Diseases of the Upper Respiratory Tract (470-478)			2
		<i>473 Chronic sinusitis</i>			c
<input type="checkbox"/>		Pneumonia & Influenza (480-488)			2
		<i>486 Pneumonia, organism unspecified</i>			
<input type="checkbox"/>		Chronic Obstructive Pulmonary Disease & Allied Conditions (490-496)			2
		<i>490 Bronchitis, not specified as acute or chronic</i>			
		<i>491 Chronic bronchitis</i>			c
<input type="checkbox"/>		493 Asthma		1	c
		<i>Other Diseases of Respiratory System (510-519)</i>			
		<i>511 Pleurisy</i>			
<input type="checkbox"/>	9. DISEASES OF THE DIGESTIVE SYSTEM (520-579)			1	2
		<i>Diseases of Oral Cavity, Salivary Glands, & Jaws (520-529)</i>			
		<i>521 Diseases of hard tissues of teeth</i>			
		<i>522 Diseases of pulp and periapical tissues</i>			
		<i>525 Other diseases and conditions of the teeth and supporting structures</i>			
		<i>Diseases of Esophagus, Stomach, & Duodenum (530-538)</i>			
		<i>530 Diseases of esophagus</i>			
		<i>535 Gastritis and duodenitis</i>			
		<i>536 Disorders of function of stomach</i>			
		<i>Hernia of Abdominal Cavity (550-553)</i>			
		<i>550 Inguinal hernia</i>			
		<i>553 Other hernia of abdominal cavity without mention of obstruction or gangrene</i>			
		<i>Noninfectious Enteritis & Colitis (555-558)</i>			
		<i>558 Other and unspecified noninfectious gastroenteritis and colitis</i>			
		<i>Other Diseases of Digestive System (570-579)</i>			
<input type="checkbox"/>		571 Chronic liver disease and cirrhosis		*	* c
		<i>574 Cholelithiasis</i>			
<input type="checkbox"/>		577 Diseases of pancreas		*	*
		<i>578 Gastrointestinal hemorrhage</i>			
<input type="checkbox"/>	10. DISEASES OF THE GENITOURINARY SYSTEM (580-629)				2
<input type="checkbox"/>		Other Diseases of Urinary System (590-599)		1	2
		<i>590 Infections of kidney</i>			
		<i>592 Calculus of kidney and ureter</i>			
		<i>597 Urethritis, not sexually transmitted, and urethral syndrome</i>			
		<i>599 Other disorders of urethra and urinary tract</i>			
<input type="checkbox"/>		Inflammatory Disease of Female Pelvic Organs (614-616)			2
		<i>614 Inflammatory disease of ovary, fallopian tube, pelvic cellular tissue, and peritoneum</i>			
		<i>616 Inflammatory disease of cervix, vagina, and vulva</i>			
<input type="checkbox"/>	12. DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE (680-709)				2
<input type="checkbox"/>		681-682 Cellulitis			2
		<i>683 Acute lymphadenitis</i>			
		<i>686 Other local infections of skin and subcutaneous tissue</i>			
<input type="checkbox"/>	13. DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE (710-739)			1	2
		<i>Arthropathies & Related Disorders (710-719)</i>			c
		<i>715 Osteoarthritis and allied disorders</i>			c
		<i>716 Other and unspecified arthropathies</i>			c
		<i>717 Internal derangement of knee</i>			c

<input checked="" type="checkbox"/> Group	Sub-Group	ICD-9-CM Code and Name of Principal Diagnosis	Version of Triage Tool	Chronic
	<i>Dorsopathies (720-724)</i>			
		721 Spondylosis and allied disorders		c
		723 Other disorders of cervical region		
		724 Other and unspecified disorders of back		
	<i>Rheumatism, Excluding the Back (725-729)</i>			
		726 Peripheral enthesopathies and allied syndromes		
		727 Other disorders of synovium, tendon, and bursa		
		728 Disorders of muscle, ligament, and fascia		
		729 Other disorders of soft tissues		
	<i>Osteopathies, Chondropathies, & Acquired Musculoskel. Deformities (730-739)</i>			
		730 Osteomyelitis, periostitis, and other infections involving bone		c
		733 Other disorders of bone and cartilage		
<input type="checkbox"/>	16. SYMPTOMS, SIGNS, AND ILL-DEFINED CONDITIONS (780-799)		2	
		780 General symptoms		
		782 Symptoms involving skin and other integumentary tissue		
		784 Symptoms involving head and neck		
		786 Symptoms involving respiratory system and other chest symptoms		
		787 Symptoms involving digestive system		
		789 Other symptoms involving abdomen and pelvis		
<input type="checkbox"/>	17. INJURY AND POISONING (800-999)		2	
		815 Fracture of metacarpal bone(s)		
		845 Sprains and strains of ankle and foot		
		873 Other open wound of head		
		920 Contusion of face, scalp, and neck except eye(s)		
		924 Contusion of lower limb and of other and unspecified sites		
		959 Injury, other and unspecified		
<input type="checkbox"/>	970 Poisoning by central nervous system stimulants			
<input type="checkbox"/>	SUPPLEMENTARY CLASSIFICATION OF FACTORS INFLUENCING HEALTH STATUS AND CONTACT WITH HEALTH SERVICES (V01-V89)		2	
		V22 Normal pregnancy		
		V54 Other orthopedic aftercare		
		V58 Encounter for other and unspecified procedures and aftercare		
		V67 Follow-up examination		
		V71 Observation and evaluation for suspected conditions not found		
		V79 Special screening for mental disorders and developmental handicaps		

Triage tool notes:

Triage tool I is for patients for whom the amount of jail time is known

Triage tool II is for patients for whom only hospital and clinic data is available

Chronic medical conditions are denoted by "c" in the Chronic column

* Rare diagnoses not listed in either triage tool but associated with a high probability of being in the 10th decile

Main condition treated during this hospital visit? _____

When will this patient be discharged? _____

Does this patient have a disability, that is a physical or mental impairment that substantially limits one or more of the major life activities?

Yes No Don't Know

Is this patient ambulatory? Yes No Don't Know

Is this patient expected to recover and live independently without continuing nursing care?

- Yes No Don't Know

Will this patient need short-term respite care?

- Yes No Don't Know

The 10th Decile Project places eligible high-need homeless patients temporarily in hotels, and then after the necessary documentation is assembled and approvals obtained, into permanent supportive housing. The project does not currently have access to respite care, recuperative care or skilled nursing beds. To be viable in the project, individuals must be able to live alone in a hotel and then in permanent supportive housing. Check (☑) if the patient has any of the following conditions that are barriers to live in the housing that is available:

- 1. Wheel chair - assistance is not available to move patients into and out of wheel chairs. Patients in wheel chairs are viable for the project only if they are sufficiently ambulatory to be able to get out of the wheel chair and into a taxi, onto a toilet, and into a bed on their own.
- 2. Colostomy bag
- 3. Urinary catheter
- 4. Tracheotomy
- 5. Feeding tube
- 6. Ongoing intravenous therapy
- 7. Serious wounds that require ongoing wound care
- 8. Incontinent of urine or feces
- 9. Evidence of active tuberculosis
- 10. At risk for alcohol withdrawal seizures/delirium tremors and needs medical detoxification
- 11. Serious suicidal or assaultive risk

Does this patient have any of these eleven barriers?

- Yes No Don't Know

IV. Hospital Usage and Justice System History

IN THE PAST 3 YEARS:

If possible, provide information about jail and hospital use in the past three-years. None of this information excludes the patient from possible housing referral.

- | | | | | |
|---------------------------|------------------------------|-----------------------------|-------------------------------------|---|
| Jail or probation record? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | 1 |
| Mental health inmate? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | 1 |
| Emergency room patient? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | 2 |
| Hospital inpatient? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | 2 |

IN THE PAST 2 YEARS:

This section on past health care use in the past two-years is extremely important. Please look up this information in patient records.

- | | |
|-------------------------------------------------------------------------------------------|-----|
| Outpatient Clinics (#visits) _____ (all clinics) | 1 2 |
| Emergency Room (#visits) _____ (all hospitals) | 1 2 |
| Hospital inpatient (#admissions) _____ (all hospitals) (#days) _____ | 1 2 |
| Jail (#days) _____ (all facilities) | 1 |
| If any of this time was spent at Twin Towers, how many days? _____ | 1 |

Completion

Once completed, please fax [fax number] or email [email address] this form to [name of screening organization].

Then call [name of screening staff] at [name of screening organization]: [telephone number].

ENDNOTES

¹ Economic Roundtable (2009), *Where We Sleep: The Costs of Housing and Homelessness in Los Angeles*; and (2010), *Tools for Identifying High-Cost, High-Need Homeless Persons*, <http://www.economicrt.org>.

² The first triage tool uses both jail and hospital usage information as well as diagnostic and descriptive information about the individual: Economic Roundtable (2011), *Crisis Indicator: Triage Tool for Identifying Homeless Adults in Crisis*, www.economicrt.org. The second triage tool was developed to avoid the need for jail information, which often is not available, and to use only information that is available to hospitals: Economic Roundtable (2012), *Hospital to Home: Triage Tool II for Identifying Homeless Hospital Patients in Crisis*, www.economicrt.org. The tools are available in Excel format and both tools and the reports explaining them can be downloaded from the Economic Roundtable website: <http://www.economicrt.org>.

³ Several of the fields of information in the form for collecting hospital diagnostic and service use data are not used in the triage tool, but are used to identifying patients who have unusual and very serious medical conditions that are likely to place them in the 10th decile:

- Pulmonary Tuberculosis (011)
- Human Immunodeficiency Virus (HIV) Infection (042)
- Diabetes mellitus (250)
- Cardiac dysrhythmias (427)
- Other venous embolism and thrombosis (453)
- Chronic liver disease and cirrhosis (571)
- Diseases of pancreas (577)

⁴ The Health Insurance Portability and Accountability Act of 1996 (HIPAA) sets national standards for protecting the security of patient health information.

⁵ Housing First together with a harm reduction approach entail providing housing as quickly as possible regardless of the challenges the homeless individual is experiencing. These challenges may well include addiction and mental illness. A range of services are immediately offered to help the individual achieve stability, remain housed, and enhance their overall well-being. Housing is not contingent upon participation in services. Through a variety of early engagement and community-building activities, coupled with a safe, supportive environment, easy access to services, no predetermined sequence or set of services, and a highly client-driven approach to developing a services plan, staff engages the individual in services designed meet his or her specific needs.

⁶ One-hundred-thirty of the 163 individuals screened were in the 10th decile based on triage tool scores. One additional person was added to the population eligible for inclusion and engagement based on a clinical over-ride of the triage tool score.

⁷ This analysis was made possible by a unique and exceptionally valuable database that the Los Angeles County Chief Executive Office created by linking service and cost records across county departments for a representative sample of 13,176 General Relief recipients. This project was called the Adult Linkage Project (ALP). Among these destitute individuals, 9,186 had an episode of homelessness during the 22-month data window available for all of the linked records. The ALP database was provided to the Economic Roundtable and used to create a new kind of screening tool based on ranking the public costs for homeless adults with many different combinations of attributes. To our knowledge, this is the only tool for prioritizing the needs of homeless individuals that is based on cost data for a generally representative sample of homeless persons. The results of this study are reported in *Where We Sleep*. A triage tool derived from this data that enables gatekeeper institutions such as hospitals, clinics and jails to identify accurately individuals experiencing homelessness whose acute needs create the greatest public costs, and to make credible requests to housing providers that these individuals be given first priority for the scarce supply of affordable housing with services is described in *Crisis Indicator: Triage Tool for Identifying Homeless Adults in Crisis*. Both reports can be downloaded at www.economicrt.org.

⁸ These costs may be lower than is typical for most hospitals because Saint John's Health Center's charity care rate, which applies to homeless patients, is much lower than typical hospital costs.

⁹ Information for estimating costs is from the following sources: rental and operating costs for permanent supportive housing are from *Where We Sleep: Costs when Homeless and Housed in Los Angeles*, p. 30, adjusted with 3 percent annual inflation factor since 2009; the monthly Supplemental Security Income benefit amount of \$866.40 a month in 2013 is from the Social Security Administration, <http://www.ssa.gov/pubs/EN-05-11125.pdf>; U.S. Department of Housing and Urban Development fair housing rent subsidy level amount of \$911 for an efficiency unit in Los Angeles County in 2013 is from <http://www.huduser.org/portal/datasets/fmr/fmrs/docsys.html&data=fmr13>; one-time costs for screening, assisting and housing patients, totaling \$10,037 per person are from the FUSE pilot project – this funding dropped to \$5,554 in the SIF project, requiring navigators to offset the shortfall with other local funds. Even the original, higher FUSE budget was insufficient to pay the cost of extended stays in temporary housing, which costs \$35 to \$70 dollars a night, depending on the area of Los Angeles County, and totals \$6,300 to \$12,600 over six months, the typical time required to place clients in permanent housing during the evaluation time window. In addition, the move-in cost of \$1,000 may understate actual costs, which are reported to be close to \$2,000.

¹⁰ Costs for permanent supportive housing are from *Where We Sleep: The Costs of Housing and Homelessness in Los Angeles*, pp. 58-60, adjusted to 2012 dollars. Most of the construction cost for permanent supportive housing is typically paid at the time of construction, rather than financed through a mortgage that is amortized while the dwelling is occupied. The value of the up-front subsidy that is provided to build the unit, amortized over the depreciable life of the building, together with the typical level of project-based supportive services is approximately \$14,450 a year.

¹¹ For an analysis of cost savings resulting from higher levels of supportive services, see *Where We Sleep: The Costs of Housing and Homelessness in Los Angeles*, pp. 41-42.

¹² *Where We Sleep: The Costs of Housing and Homelessness in Los Angeles*, p. 58.

¹³ We are indebted to William Huang, Housing Director of the City of Pasadena, for identifying this policy option.

Hospital to Home

Triage Tool II for Identifying Homeless Hospital Patients in Crisis



Economic Roundtable
Nonprofit Research and Innovation

Hospital to Home

Triage Tool II for Identifying Homeless Hospital Patients in Crisis

2012

Daniel Flaming and Patrick Burns
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Public record linkage, database construction and data mapping

This report has been prepared by the Economic Roundtable, which assumes all responsibility for its contents. Data, interpretations and conclusions contained in this report are not necessarily those of any other organization that supported or assisted this project.

This report can be downloaded from the Economic Roundtable web site:
www.economicrt.org

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Executive Summary

The likelihood that different conditions of body and mind found among homeless adults will result in hospitals and jails becoming their caregivers provide the basis for the triage tool. This paper presents the second iteration of the tool, developed specifically for use in *hospitals or clinics* with access to hospital data to identify the ten percent of homeless patients with the highest public costs - the 10th decile.

While homeless individuals are invisible in most public data, they may be intensive user of public services. Typically, use of these services appears as unidentified and unconnected dots in local administrative records. The tool connect some of these dots, the predictive power of 51 pieces of information are combined to identify patients with the highest public costs and most acute needs. The most powerful components of the model are the number of days spent in hospitals as an inpatient and the number of emergency room visits.

This is a *system-based* tool for using rich information held by *hospitals and affiliated clinics* to identify the one-tenth of homeless persons with the highest public costs and the severe ongoing crises that create those high costs. This is the highest need segment of a much larger homeless population needing supportive housing.

The core function of the tool is to differentiate homeless individuals with the highest public costs from other homeless individuals with less severe conditions. This cost spread is based on health conditions and history of using public services. The tool equips hospitals and affiliated clinics to make credible requests to housing providers that high-need patients be given first priority for the scarce supply of affordable housing with supportive services.

This is the second triage tool that has been developed. It eliminates the need for justice system data and uses only data available in hospital settings. It produces accurate assessment by using a broad range of diagnostic information as well as demographic characteristics. The tool partitions individuals being screened into four sub-groups based on gender and age of males, with separate statistical models for each group.

This tool can be used on a case-by-case basis to screen individual hospital patients, or it can be used to screen the entire patient database of a hospital so that high-need patients are flagged when they enter the hospital. Given the demands on the time of hospital staff, particularly in emergency rooms, having high-need patients flagged when they enter the hospital makes it much more feasible to bring in social service and housing navigation teams to work with patients before they are discharged from the hospital.

The triage tool is in Excel format and can be downloaded from the Economic Roundtable web site: www.economicrt.org.

Despite the desire of most homeless individuals to be housed, the transition from the street into housing may well be difficult. At a minimum, it means changing basic habits about eating, sleeping and co-existing with other people. These changes can be very challenging for an individual who is mentally and physically ill, addicted, and wary of the intentions of others. Immediate access to case management and health services along with housing is critical for helping the high-need, severely disabled individuals in the 10th decile make this transition.

The triage tool is being introduced or used in 17 hospitals in Los Angeles County. Screening and housing programs at these hospitals have been developed in collaboration with the

Corporation for Supportive Housing, through its Frequent Users Systems Engagement (FUSE) Program and through a Social Innovation Fund (SIF) grant from the Corporation for National and Community Service. Seven social service and housing navigation teams are working to house high-need patients from these hospitals. The hospitals as well as the backdrop of homelessness in Los Angeles County are shown in Figure 8.

Social service and housing navigation teams provide immediate, comprehensive services for 10th decile homeless patients identified at each hospital. This complete package of services is critical given the high level of need among these patients. The services begin with a warm hand-off at the hospital before the patient is discharged and include:

- Immediate *case management, service delivery and advocacy* for helping individuals make the transition into housing and obtain needed services.
- Fulfillment of immediate needs such as filling *prescriptions* or providing *hygiene items*.
- Immediate *temporary housing*.
- Rapid connection with *health services* at Federally Qualified Health Centers (FQHCs).
- Rapid connection with mental health and behavioral health services when needed.
- Assistance in qualifying for *benefits* including Supplemental Security Income (SSI), Medicaid, and Section 8 housing vouchers.
- *Permanent supportive housing* as quickly as possible.

To our knowledge, this is the only tool for prioritizing the needs of homeless individuals that is based on cost data for a generally representative sample of homeless persons. This was made possible by a unique and exceptionally valuable database created by Los Angeles County's Chief Executive Office that links service and cost records across county departments for a representative sample of General Relief recipients, 70 percent of whom were homeless during the data window provided by the linked records.

The purpose of the tool is not to identify specific cost amounts, but rather to identify individuals with the highest costs. This supports a strategy of progressive engagement that targets the costliest and scarcest resources on those with the most acute needs.

It is reasonable to expect the factors used by the tool to be valid for metropolitan areas throughout the United States. This assessment is based on two basic realities. First, the health conditions that are factors in the statistical models that drive the tool are defined using an international system for classifying diseases (ICD-9-CM), so the diagnostic inputs remain the same regardless of geographic area. Second, these health conditions are likely to have a similar course and to require similar responses from hospitals in any region that provides health care services for indigent residents with urgent medical or mental health problems.

Hospital to Home

Triage Tool II for Identifying Homeless Hospital Patients in Crisis

Daniel Flaming and Patrick Burns, Economic Roundtable
Gerald Sumner, statistician and triage tool developer

Overview

The likelihood that different conditions of body and mind found among homeless adults will result in hospitals and jails becoming their caregivers provide the basis for the triage tools. This paper presents the second iteration of the tool, developed specifically for use in *hospitals or clinics* with access to hospital data to identify the ten percent of homeless patients with the highest public costs - the 10th decile.

We know much less about individuals experiencing homelessness than we do about housed residents of the community. This is because people who are off of the housing grid are left out of most public data collection programs. However, while homeless individuals are invisible in most public data, they may be intensive user of public services. Typically, use of these services appears as unidentified and unconnected dots in local administrative records. The triage tools connect some of these dots, in the case of this newest tool, the predictive power of 51 pieces of information are combined to identify patients with the highest public costs and most acute needs.

Background

The tools were developed based on two key propositions. The first proposition is that the greatest risk to homeless individuals is of continuing crises in their lives, notably crises that cause encounters with hospitals and jails. The second proposition is that the most compelling basis for prioritizing access of homeless individuals to the scarce supply of permanent supportive housing is the public costs that will be avoided when they are housed.

These are *system-based* tools for using rich information held by *gatekeeper institutions* such as hospitals and jails to identify the one-tenth of homeless persons with the highest public costs and the acute ongoing crises that create those high costs. This is the highest need segment of a much larger homeless population needing supportive housing. **The tools identify homeless adults who are most likely to have acute crises that create high public costs.**

This tool can be used on a case-by-case basis to screen individual patients, or it can be used to screen the entire patient database of a hospital so that high-need patients are flagged when they enter the hospital. Given the demands on the time of hospital staff, particularly in emergency rooms, having high-need patients flagged when they enter the hospital makes it much more feasible to develop a discharge plan for entering housing.

The triage tools grew out of earlier work¹ that identified the costs to different public agencies for a representative sample of adults experiencing homelessness, ranked them by their public costs, and divided them into ten groups of equal size (deciles). The highest cost decile accounted for 56 percent of all public costs for homeless single adults.²

Discovery of the exceptionally high public costs for homeless individuals in the 10th decile led to interest in identifying these individuals and giving them top priority for permanent supportive housing, and this led to development of these tools.³ There are at least *five* reasons for this interest.

First, individuals in the 10th cost decile have very high public costs.

Second, there are very large cost savings when homeless individuals obtain permanent supportive housing along with the safety and stability it provides. Public costs for individuals in the 10th decile decrease by 86 percent when they live in permanent supportive housing.

Third, the supply of permanent supportive housing is far smaller than the population of disabled homeless persons who need this combination of affordable housing and supportive services. This creates a need for reliable, objective information that identifies individuals with the most acute needs and highest public costs who should be given first priority.

Fourth, these individuals often need special efforts on their behalf to gain access to permanent supportive housing. This is because 68 percent have mental disabilities that often are a barrier to completing multiple detailed applications for benefits and housing, as well as documenting their personal identity, income and disability status. Furthermore, fair housing laws are often interpreted to require renting these units on a first-come, first-served basis, creating a barrier to prioritizing high-need individuals.

Fifth, high public costs are the result of ongoing crises in individuals' lives that are resolved in expensive institutional settings – jails and hospitals. Increasing the level of stability and reducing the frequency and severity of crises through permanent supportive housing greatly improves the quality of these individuals' lives.

Detailed understanding of costs when homeless, cost savings when housed, and development of the tools has been made possible by two unique and exceptionally valuable databases of linked service and cost records created by Los Angeles County's Chief Executive Office. The first database contains records for a representative sample of 13,176 General Relief recipients from a project now known as the Enterprise Linkages Project (ELP). Among these destitute individuals, 9,186 had an episode of homelessness.⁴ The second database was created in collaboration with the Economic Roundtable and contains records for 1,007 individuals who exited homelessness by entering permanent supportive housing.

This information made it possible to develop screening tools based on the public costs for homeless adults with many different combinations of attributes, and to use this data to give highest priority for supportive housing to homeless individuals likely to have the greatest reduction in net public outlays when housed.⁵

Development of the Tools

This newest triage tool is the second tool that has been developed. It equips *hospitals and affiliated clinics* to identify homeless patients experiencing homelessness whose acute needs create the greatest public costs, and to make credible requests to housing providers that these individuals be given first priority for the scarce supply of affordable housing with supportive services.

The *first tool* was released in 2011.⁶ It uses 27 pieces of information and partitions individuals being screened into three sub-groups based on age, with separate statistical models

for each group. If good data about incarceration history *is* available, the first tool is more reliable and should be used. If good incarceration history is *not* available, the second tool is more reliable and should be used.

A limitation of the first tool is that when working with patients in hospital settings, it is often difficult to obtain good information about episodes of incarceration. One reason is that patients may prefer not to disclose stigmatizing information. Another reason is that individuals in the 10th decile are often poor historians of their own lives and unable to provide clear information about whether episodes of incarceration occurred in the past two years, how long the incarceration lasted, or the type of facility in which they were incarcerated.

The *second tool* was developed to eliminate the need for incarceration data. It uses only data available in hospital settings. It uses 51 pieces of information and partitions individuals being screened into four sub-groups based on gender and age of males, with separate statistical models for each group. It makes more extensive use of medical information than the first version of the tool. When information about incarceration history is *not* available, the second tool is the most reliable and should be used.

The information with the most predictive power for identifying individuals in the 10th decile is the number of days spent in hospitals as an inpatient or in jail mental health facilities as an inmate. Health conditions have a tipping effect, some disorders increase and others diminish the likelihood that an individual is in the 10th decile. The triage tools are dependent on access to hospital records, and if possible, jail records as well.

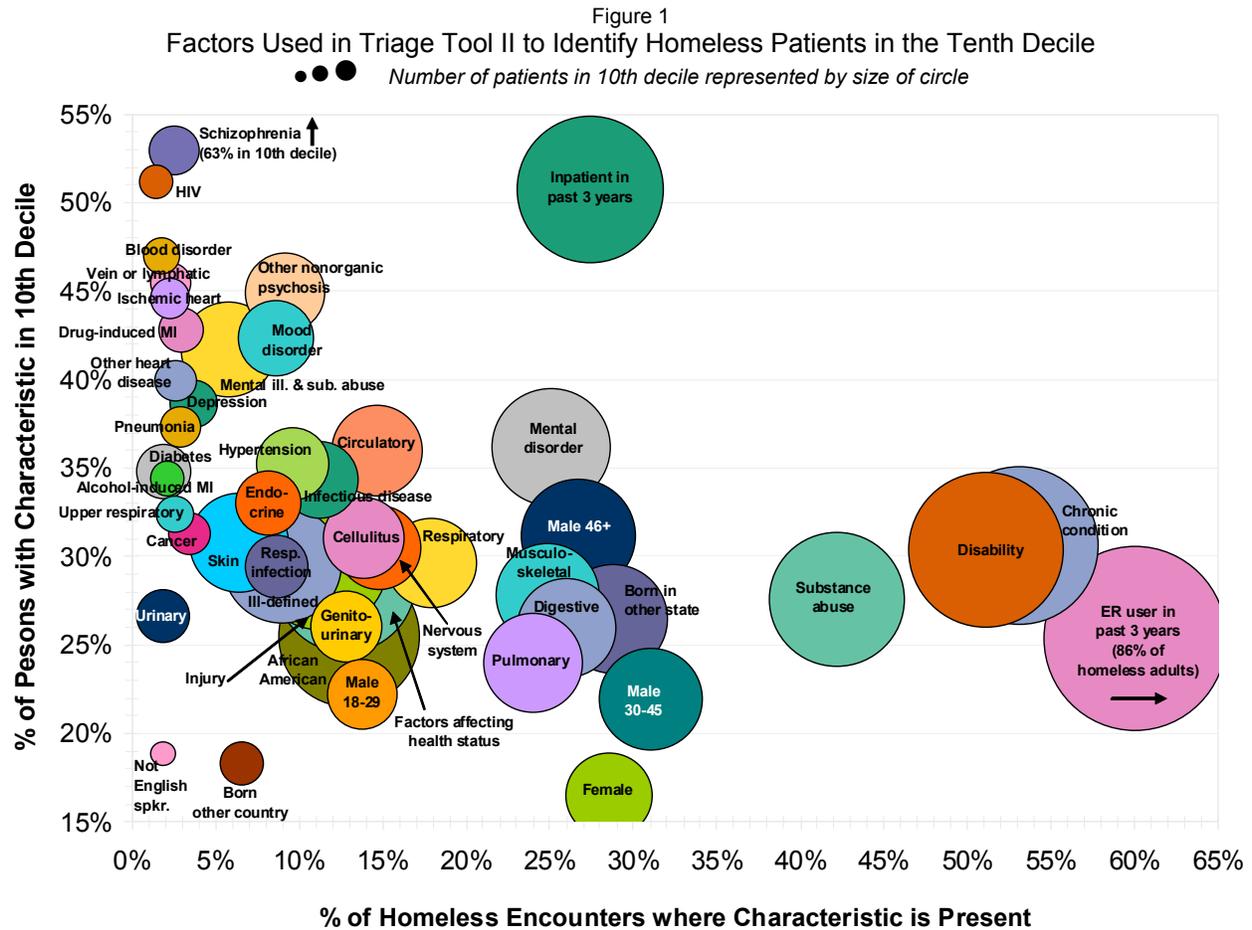
Despite the desire of most homeless individuals to be housed, the transition from the street into housing may be difficult. At a minimum, it means changing basic habits about eating, sleeping and co-existing with other people. These changes can be very challenging for individuals in the 10th decile who often are mentally and physically ill, addicted, and wary of the intentions of others. Immediate access to case management and health services is critical for helping the high-need, severely disabled individuals in the 10th decile make the transition into housing and then to remain housed.

The triage tools are in Excel format and can be downloaded from the Economic Roundtable web site: www.economicrt.org.

Applicability and Useful Life Span of Tools

The tools are information-rich methods of prioritizing access to scarce housing and supportive services. The core function of the tools is to differentiate homeless individuals with the highest public costs from other homeless individuals with less acute conditions. This cost spread is based on health conditions and history of using public services. To our knowledge, this is the only tool for prioritizing the needs of homeless individuals that is based on cost data that has been validated against a representative sample of homeless persons.⁷

It is reasonable to expect the factors used by triage tool II to be valid for metropolitan areas through out the United States. This assessment is based on two basic realities. First, the health conditions that are factors in the statistical models that drive the tool are defined using an international system for classifying diseases (ICD-9-CM), so the diagnostic inputs remain the same regardless of geographic area. Second, these health conditions are likely to have a similar



Source: 2,907 homeless General Relief recipients with no employment in the past 3 years who were treated at a hospital of the Los Angeles County Department of Health Services

course and to require similar responses from hospitals in any region that provides health care services for indigent residents with urgent medical or mental health problems.

The factor that is most likely to vary among geographic areas is public costs for incarceration. Criminal justice system policies regarding homeless residents vary widely among cities and vary over time within cities. It is likely that Los Angeles County’s incarceration costs per homeless resident vary from those of some other metropolitan area. Never the less, a large share of homeless incarceration costs are for jail mental health and medical facilities, and it may well be the case that there are roughly equivalent costs for these groups of homeless individuals in most cities – either for treatment in hospitals or for comparably expensive incarceration and treatment in special jail facilities.

The average monthly cost for homeless individuals in the 10th decile is likely to vary from region to region, reflecting differences in public costs and benefits. The purpose of the tool is not to identify specific cost amounts, but rather to identify individuals with the highest costs. This supports a strategy of progressive engagement that targets the costliest and scarcest resources on those with the most acute needs.

Triage tool II is likely to remain reliable until hospitalization practices change, or there are more effective treatments for medical conditions that are factors in the model. If there are advances in the effectiveness of medical treatment that reduce the level of health care services required for any of the medical conditions that are part of the triage tool, the tool will become dated.

These tools can be validated and improved upon through record linkage initiatives in other regions. For example, the record linkage project underway in Santa Clara County is likely to produce information about a larger population of homeless individuals covering a longer period of time, making it possible to develop predictive tools that identify individuals on a trajectory toward the 10th decile.

Information Used in Triage Tool II

Many separate pieces of information provide evidence about the likelihood that someone will be in the 10th decile, but no single piece of evidence by itself provides enough information to identify this population with adequate certainty. The tool addresses this problem by combining the predictive power of 51 factors to produce an estimate of the likelihood that an individual is in the 10th decile. These factors are shown in Figure 1 (see endnote for supporting data).⁸

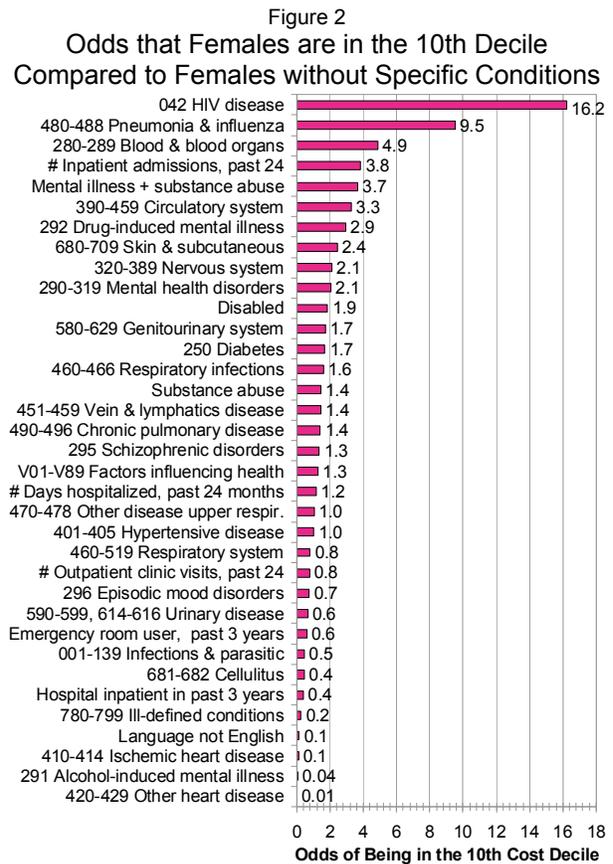
Three dimensions of information about each factor used in the tool are shown in Figure 1. The share of the homeless population seen in hospitals that have each attribute is represented on the *bottom axis*. For example, 86 percent have visited an emergency room in the past three years.

The likelihood that a person with the attribute will be in the 10th decile is represented on the *vertical axis*. For example, 25 percent of homeless individuals who have visited an emergency room in the past three years are in the 10th decile.

The relative size of the 10th decile homeless population seen in hospitals and jails that has each attribute is represented by the *bubble size*. For example, 95 percent of homeless individuals in the 10th decile have visited an emergency room in the past three years.

Odds Ratios

The four groups that are modeled separately in triage tool II each have their own set of factors that are used to estimate whether individuals in that group are in the 10th decile. These factors are shown in Figures 2-5, along



Source: 2,907 homeless General Relief recipients cared for at a hospital of the Los Angeles County Department of Health Services

with the odds that a person in each group who has an attribute will be in the 10th decile compared to a person in the same group who does not have the attribute.

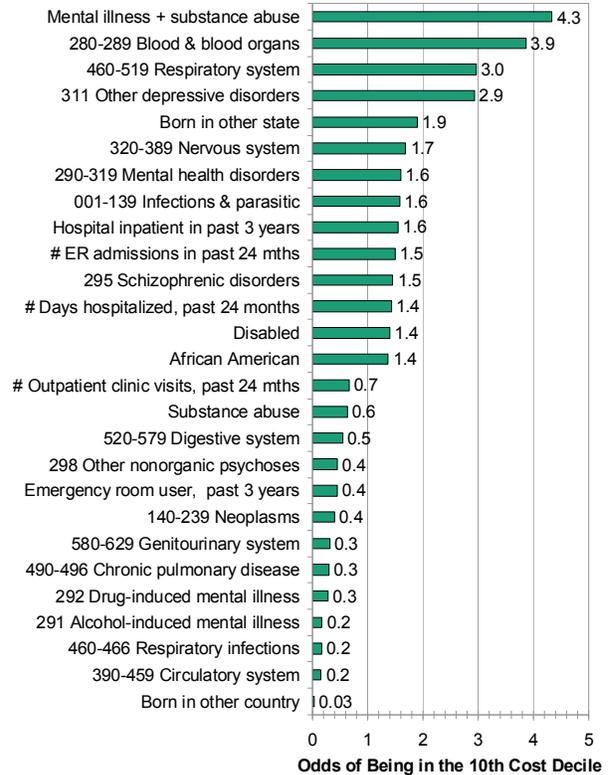
Females

Of the 35 factors used to screen homeless women (Figure 2), the most significant is HIV disease. The odds of being in the 10th decile are 16.2 times higher for women who are HIV positive than for women who are not. Next most significant is pneumonia and influenza.

Males 18 to 29

Of the 27 factors used to screen homeless men 18-29 years of age (Figure 3), the most significant is a dual diagnosis of

Figure 3
Odds that Males 18-29 are in the 10th Decile Compared to Males without Specific Conditions



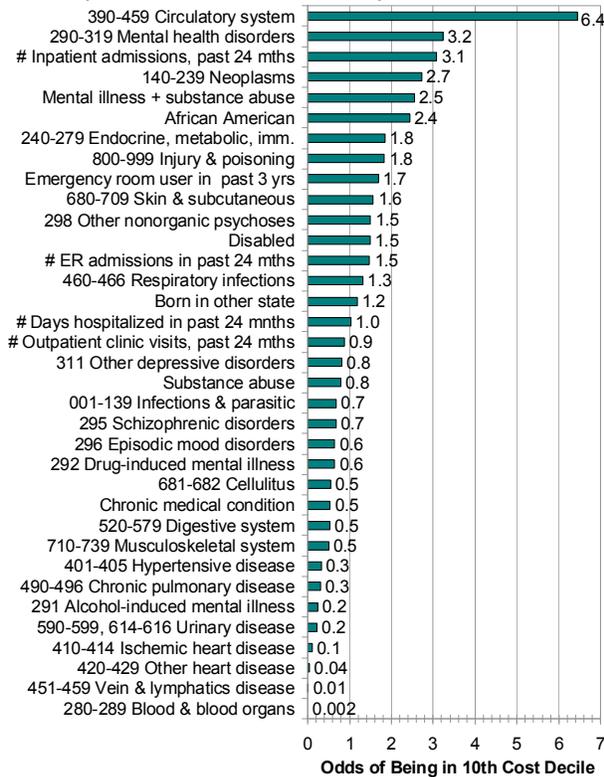
Source: 2,907 homeless General Relief recipients cared for at a hospital of the Los Angeles County Department of Health Services

mental illness and substance abuse. The odds of being in the 10th decile are 4.3 higher for men who are dual diagnosed than for men in this age group who are not. Next most significant is diseases of the blood and blood forming organs such as anemia.

Males 30 to 45

Of the 35 factors used to screen homeless men 30-45 years of age (Figure 4), the most significant is diseases of the circulatory system such as hypertension. The odds of being in the 10th decile are 6.4 times higher for men with circulatory system disease than for men in this age group without this disease. Next most significant is mental health disorders.

Figure 4
Odds that Males 30-45 are in the 10th Decile Compared to Males without Specific Conditions



Source: 2,907 homeless General Relief recipients cared for at a hospital of the Los Angeles County Department of Health Services

Males 46 and Older

Of the 36 factors used to screen homeless men 46 years of age and older (Figure 5), the most significant are diseases of veins and lymphatics, such as venous embolism and thrombosis. The odds of being in the 10th decile are 4.3 times higher for men with this disease than for men in this age group without it. Next most significant is a dual diagnosis of mental illness and substance abuse.

Accuracy of Screening for the Four Groups

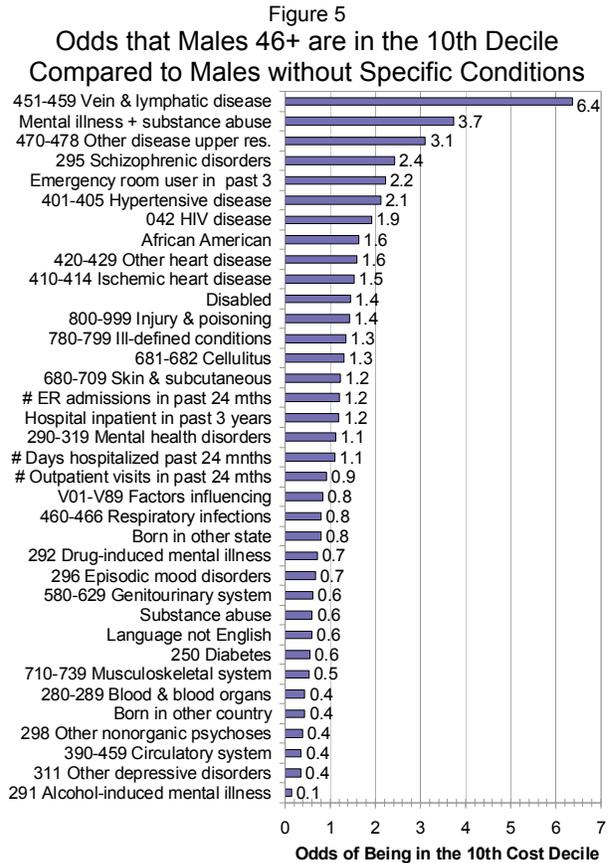
When tested against the analysis database, triage tool II made a correct determination about individuals' 10th decile status 83 percent of the time, as shown in Figure 6.⁹ Screening results for women are the most accurate, with 91 percent of cases correctly classified. Screening results for men 46 years of age and older are least accurate, with 75 percent of cases correctly classified. These results indicate that the tool is effective for determining whether individuals are in the 10th decile.

There are two types of possible classification errors. The first type is false positives – individuals who are not in the 10th decile but who are incorrectly identified by the tool as being in the highest decile. This is the least serious type of error because these are likely to be individuals who are in the 9th cost decile and on a trajectory toward the 10th decile. Inclusion of these individuals simply represents a slight loosening of eligibility criteria.

The second type of error is false negatives – incorrect exclusion of individuals who actually are in the 10th decile. This is the most serious type of error. Guidelines for using the tool provided in the following sections include the recommendation that the screening process should include an option for overriding results from the tool based on clinical understanding of a specific case and the likelihood that an individual will need a high level of care on an ongoing basis. The Diagnostic Appendix described in the following section is a resource that can be used in making these clinical assessments.

Risk Levels for Specific Medical Conditions

A separate *Diagnostic Appendix* can be downloaded from the Economic Roundtable web site. It groups 9,359 emergency room encounters and 2,060 admissions of homeless patients at



Source: 2,907 homeless General Relief recipients cared for at a hospital of the Los Angeles County Department of Health Services

Los Angeles County Department of Health Services hospitals in the database for this study by diagnostic code, and for each code shows the number of individuals in the 10th decile. These 11,419 health system encounters represent a total of 3,224 unduplicated homeless adults who were treated in 2006 and 2007. The information is shown by treatment setting for 522 3-digit ICD-9-CM diagnostic codes.

Patients with the same diagnosis are twice as likely to be in the 10th decile if they have been admitted as an inpatient rather than simply treated in the emergency room. The admissions screening for indigent patients functions as a triage process, with only the sickest patients admitted to the hospital as inpatients. When using the *Diagnostic Appendix* to assess the cost implications of a patient's condition, it is important to pay attention to whether the individual has ever been admitted to a hospital as an inpatient because of the condition.

The *Diagnostic Appendix* is valuable for understanding the public balance sheet implications of different health conditions, however, users should take note of the number of hospital encounters represented for different diagnoses. In many instances, the samples are too small to provide reliable information about the likelihood that homeless patients seen in a particular treatment setting and diagnosed with a particular condition are in the 10th decile. Most of the 522 3-digit diagnostic codes have fewer than 30 cases. However, because we know of no other source for the data provided in the *Appendix*, we are providing this information in unabridged form.

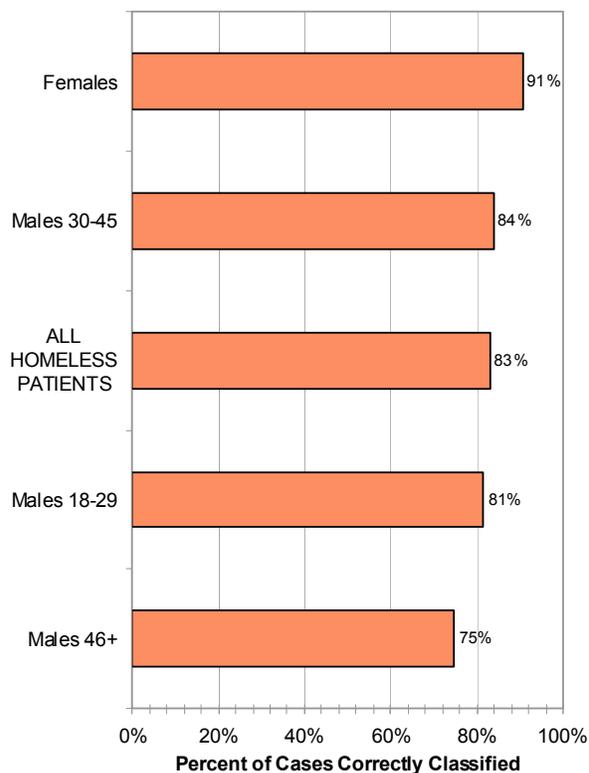
Suggestions for dealing with small samples when using this *Appendix* include:

1. Consult the rolled-up data for the diagnostic subgroup in which a specific diagnostic code is found. The subgroup is likely to provide a larger sample of similar cases.
2. Combine the emergency room and inpatient samples to obtain a larger sample.
3. As sample size diminishes, place increasing emphasis on using the data as an indicative rather than conclusive source of information.

Using Triage Tool II

The user interface of the tool is shown in Figure 7. The tool is in Excel format and uses 51 items of information. An Excel file with the working tool can be downloaded from the Economic Roundtable web site: www.economicrt.org.

Figure 6
Percent of Cases Correctly Classified by Triage Tool II in Each of the Four Homeless Groups



Source: 2,907 homeless General Relief recipients cared for at a hospital of the Los Angeles County Department of Health Services

The first 4 items identify characteristics that break patients out by gender and for males by age, with a separate statistical model for each of these four groups. The tool uses a separate model for each group because service usage and diagnostic attributes are associated with different levels of risk for each of these groups. A lower-case “y” for yes is entered in the row that describes the patient being screened.

The next 2 items reference a *3-year* time frame, asking whether the patient visited an emergency room or was admitted to a hospital as an inpatient in the past three years.

The following 4 items reference a *2-year* time frame, asking for numeric information about the frequency of outpatient visits, emergency room visits and hospital admissions, as well as the total number of inpatient days. These items have more weight in the tool than any other factors. It is very important that they be completed accurately and that to the extent possible, the information includes *all hospital care in the past two years*, not just care provided at the hospital where the screening occurs.

The next 6 items describe general attributes of the individual and can draw on information from nonmedical sources, including self-descriptions provided by the person being screened, as well as from hospital records. These factors include whether the individual was born in another country or another state, whether the preferred language is not English, whether the individual is African American, and whether the individual has a disability or a substance abuse problem. The ethnicity item is included because being African American is associated with increased likelihood of being in the 10th decile for men.

The remaining 35 items draw on medical diagnoses, some for a discrete medical condition and others for groups of medical conditions affecting a particular body system or subsystem. This information must be obtained from the patient’s medical chart. The diagnostic categories are ICD-9-CM codes used by health providers to categorize medical diagnoses.

This list of diagnostic items begins with “Chronic Condition (HCUP). This index was developed by the Healthcare Cost and Utilization Project (HCUP), a Federal-State-Industry partnership. If the patient has been diagnosed with a condition in this index, a “y” is entered. This index is available at: <http://www.hcup-us.ahrq.gov/toolssoftware/chronic/chronic.jsp>.

The top row of the triage tool, “Estimated Probability for 10th Decile,” shows the estimated probability that the person is in the 10th decile. **The recommended threshold for inclusion in the 10th decile is a probability level of 0.35, or 35 percent.** At this cutoff level, the statistical model is quite accurate and the likelihood of false positives is about equal to the likelihood of false negatives. When the cell in this row for a particular case turns green, it indicates that the 10th decile probability for that case is 0.35 or greater. All of the cases shown in Figure 7 are in the 10th decile.

The user interface shown in Figure 7 is linked to another section of the spreadsheet that contains the working formulas for combining data and calculating the estimated probability that a person is in the 10th decile. This computational part of the tool is partitioned into four discrete models that use different sets of coefficients depending on a person’s gender, and for males, age. There is one model for females, a second model for males 18 to 29 years of age, a third model for males 30 to 45 years of age, and a fourth model for males 46 years of age or older.

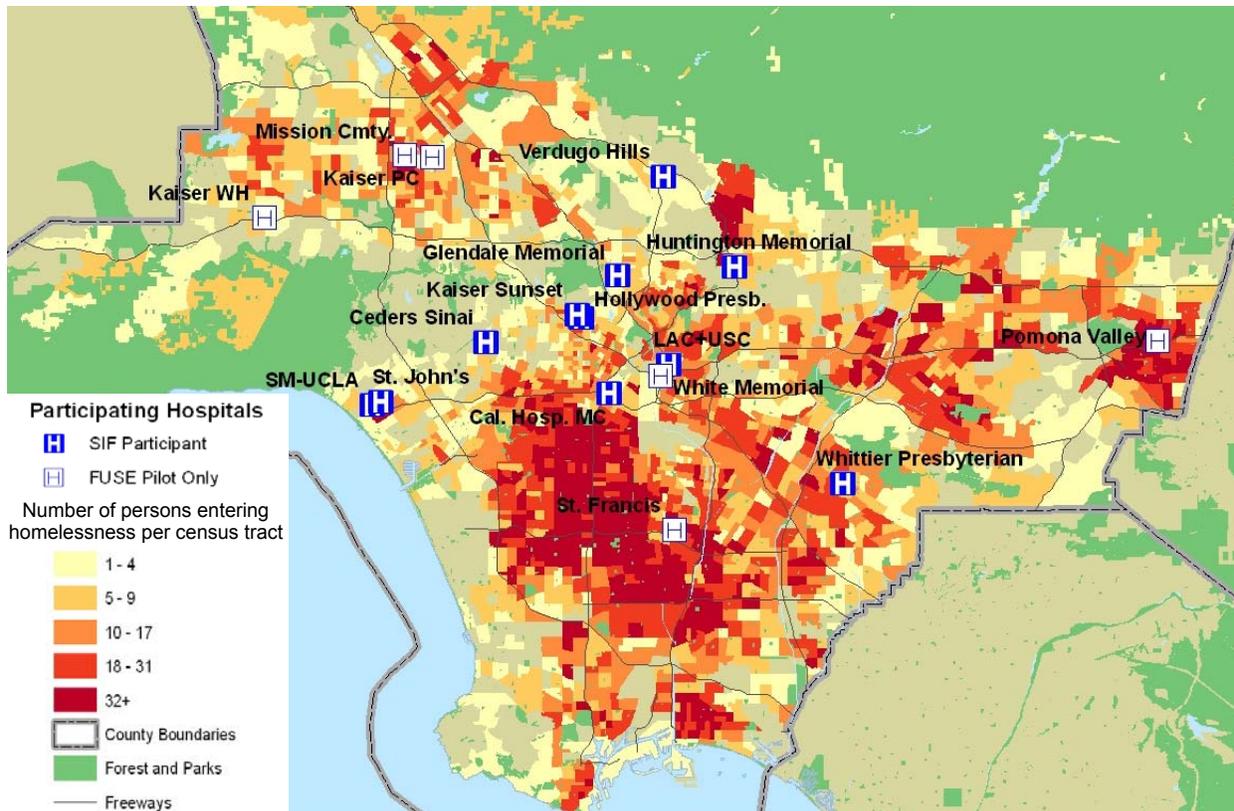
The tool draws on information from the entire study population (n=2,907) seen in hospitals to capture joint influences of all of the variables shown in Figure 7. Because the tool has been developed through statistical analysis of the strength of association among all of these variables, it can produce estimates for types of cases that are encountered infrequently.

It is important that all of the information that is applicable to an individual be entered into the tool. When less information is entered, the calculating tool usually produces outcomes that are more conservative. In the absence of the information, the model treats the missing variables as indicating that these characteristics do not apply to the person being screened. In other words, a non-yes means no. For example, if a very serious medical condition is entered but no data about emergency room visits or hospitalizations, the model will “assume” that the person has not been sick enough to require hospital care.

Screening Process Using the Triage Tool

As this paper is written, the triage tool is being introduced or used in 17 hospitals in Los Angeles County. Screening and housing programs at these hospitals have been developed in collaboration with the Corporation for Supportive Housing, through its Frequent Users Systems Engagement (FUSE) Program and through a Social Innovation Fund (SIF) grant from the

Figure 8
Hospitals Using Triage Tool on Map Showing Addresses prior to Homelessness of Los Angeles County Residents who became Homeless in 2010



Source: Economic Roundtable analysis of public assistance records provided by the Los Angeles County Department of Public Social Services.

Corporation for National and Community Service. Seven social service and housing navigation teams are working with high-need patients from these hospitals to house them. The hospitals as well as the backdrop of homelessness in Los Angeles County are shown in Figure 8.

Social service and housing navigation teams provide immediate, comprehensive services for 10th decile homeless patients identified at each hospital. This complete package of services is critical given the high level of need among these patients. The services begin with a warm hand-off at the hospital before the patient is discharged and include:

- Immediate *case management, service delivery and advocacy* for helping individuals make the transition into housing and obtain needed services.
- Fulfillment of immediate needs such as filling *prescriptions* or providing *hygiene items*.
- Immediate *temporary housing*.
- Rapid connection with *health services* at Federally Qualified Health Centers (FQHCs).
- Rapid connection with mental health and behavioral health services when needed.
- Assistance in qualifying for *benefits* including Supplemental Security Income (SSI), Medicaid, and Section 8 housing vouchers.
- *Permanent supportive housing* as quickly as possible.

A flow chart showing the steps for screening and assisting patients is shown in Figure 9.

Pre-screening (Steps 1-2 in Figure 9)

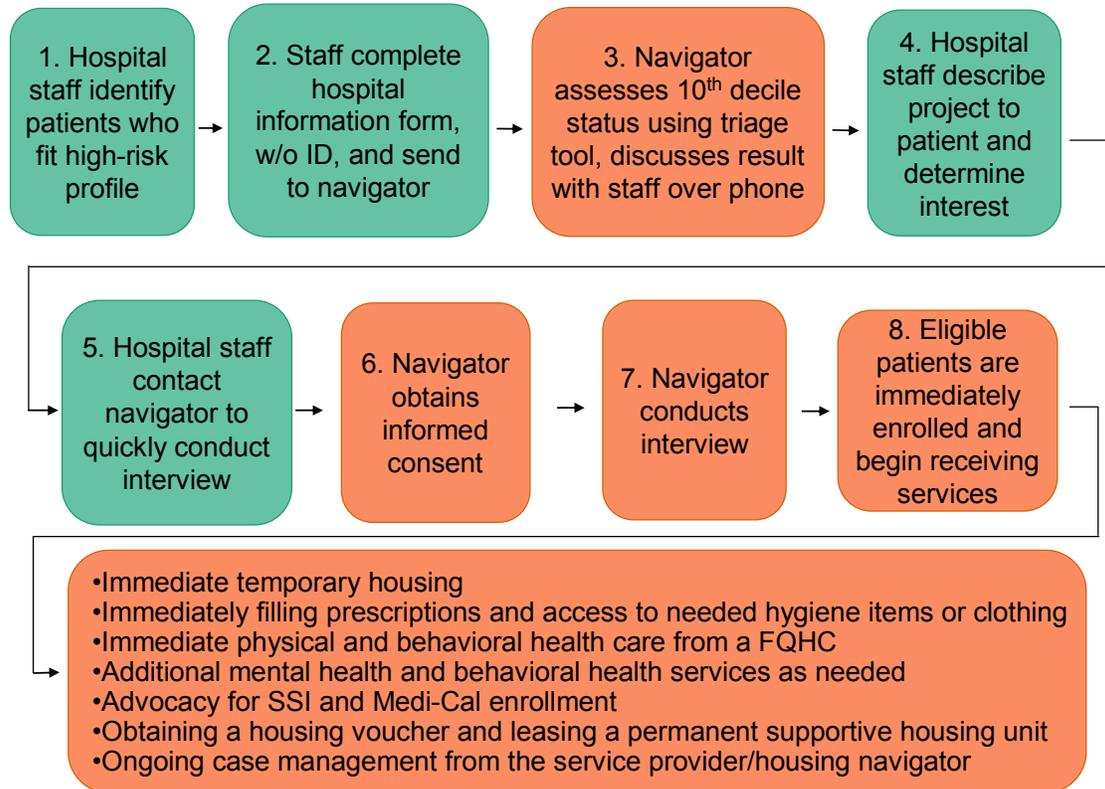
Medical staff identifies patients who fit the profile of individuals in the 10th decile. Often this is done by hospital social workers. The key elements of the profile are that patients are homeless and have above-average use of hospital services. For example, aside from any other health factors and without any jail time, a patient who has visited the emergency room 14 or more times in the past two years would be in the 10th decile profile, even if he or she had not been admitted as an inpatient. Similarly, a patient who had been admitted to the hospital as an inpatient three times and stayed in the hospital a total of nine days would be in the 10th decile profile.

An important reason for the pre-screening is to minimize or entirely prevent instances when the program is presented to patients and their hopes are raised about having a place of their own in which to live, but then are disappointed when they are screened out of the program because they score “low” on the 10th decile. Patients are approached about the program only after it is confirmed that they are in the 10th decile profile.

The steps in Figure 9 that are carried out by hospital staff are highlighted in green, and the steps carried out by the housing navigator/service provider are highlighted in orange.

After a patient who fits the 10th decile profile is identified, hospital or clinic staff complete a form that provides information used in the tool. The key pieces of information are the patient’s gender, age, diagnosed medical conditions, and number of visits to the hospital over the past two years. The form also collects information that flags probable barriers to obtaining HUD Section 8 vouchers, which are typically used to pay much of the monthly rent for permanent supportive housing. In addition, the form collects information for assessing whether the patient has ongoing nursing needs that require care in a skilled nursing facility rather than in permanent supportive housing. When possible, information is also obtained about use of other

Figure 9
Flow Chart of Steps in Hospital Screening



hospitals and this hospital use data is included in the information entered into the tool. A copy of the form used to compile this information is in the *Patient Screening Appendix*.¹⁰

Screening with Triage Tool (Steps 3-5 in Figure 9)

The completed hospital information form is sent to the housing navigator/service provider who works closely with 10th decile patients and assists them in obtaining benefits, ongoing outpatient health and behavioral health care, and housing. Depending on hospital policies and the relationship between the hospital and the navigator, the form may be sent without a name on it in order to protect patient confidentiality.

The navigator quickly enters information from the hospital information form into the triage tool and informs hospital staff about the result. If the tool shows that the probability of the patient being in the 10th decile is 0.35 or higher, hospital or clinic staff describe the project to the patient and explain that it is possible he or she may be able to get a place of their own in which to live. If the patient is interested, hospital staff informs the navigator of this, and the navigator comes quickly to the hospital to interview the patient and begin the process of a warm hand-off of the patient to the navigator.

If the probability is less than 0.35, the cutoff point, the reasonableness of this outcome can be reviewed with medical staff. If warranted, negative results from the tool can be

overridden based on clinical judgment. *The triage tool is designed to assess the current level of public costs for a patient, not to predict future costs.* If a patient were recently diagnosed with one of the high-cost medical conditions shown in Figure 10, for example, this would be an important factor to take into consideration in deciding whether to override results from the tool and include the patient in the 10th decile group based on the strong likelihood of high public costs in the future.

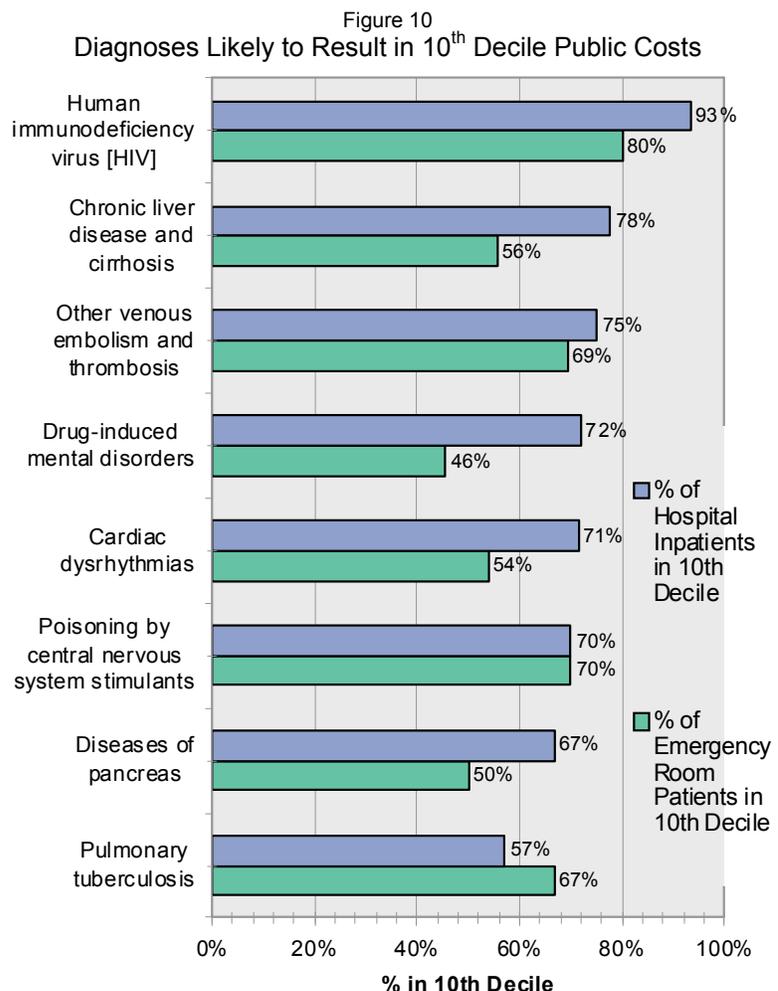
Interview, Enrollment and Warm Hand-off (Steps 6-8 in Figure 9)

The navigator's meeting with the patient in the hospital is the final step in the screening process and the first step in building a long-term relationship with growing trust. In order to obtain a lease from a permanent supportive housing provider, the

patient typically needs to have both a Section 8 housing voucher to pay the bulk of the rent and an ongoing source of income, most often from Supplemental Security Income (SSI) to cover the tenant's portion of the rent and to pay living expenses. Among other things, the interview determines whether there are any showstoppers for obtaining a Section 8 housing voucher.

Six barriers can prevent individuals from having access to permanent supportive housing because of limitations on publicly funded housing subsidies, or restrictions of the insurance companies that cover housing providers, or the program design of supportive housing itself. During the screening interview, these barriers are identified and the patient is asked if any of them apply to him or her. At a minimum, this provides fair warning to the patient about these barriers, should they come up while seeking to qualify the individual for permanent supportive housing. The barriers are:

1. Undocumented immigration (barrier to local, state and federal subsidies)
2. Being on parole for a violent crime (barrier to federal housing subsidies)
3. Conviction for arson (prohibited by housing providers' liability insurance)



Source: 2,907 homeless General Relief recipients cared for at a hospital of the Los Angeles County Department of Health Services

4. Conviction for operating a methamphetamine lab (barrier to federal housing subsidies)
5. Convicted for an offense that requires registering as a sex offender (barrier to federal housing subsidies)
6. Not expected to recover from a disorder or injury to the extent that the individual will be able to live independently without continuing nursing care (supportive housing does not provide on-site nursing care and tenants must be sufficiently ambulatory to be able to live independently)

Ongoing Engagement and Support (Last Step in Figure 9)

The identification of probable 10th decile patients, triage tool assessment, and follow-up interview all occur quickly - within two hours if possible. This is necessary because the hospital often needs the bed for another patient, and also because the patient may be restless to leave the hospital. For example, patients may be addicts or alcoholics and may want to return to the street to self medicate.

Every effort is made to avoid telling patients about the housing program until the triage tool assessment identifies them as eligible and a review of information provided by the hospital indicates that there are not any insurmountable barriers to obtaining permanent supportive housing. In the rare instance that a patient has been engaged, but it is then determined that they do not match the criteria for the program, this outcome is explained and the patient counseled about how to gain access to available services. The patient is also provided with a gift card for a meal at a local restaurant.

After the patient is enrolled in the program, the case manager/housing navigator assumes immediate responsibility for assisting the individual. This includes assessing what type of temporary housing is needed and providing transportation to the housing site, visiting a Federally Qualified Health Center to arrange follow-up care, and beginning the process of obtaining the documentation and benefits needed to become permanent supportive housing tenant. These services are provided by knowledgeable and empathic staff, using a Housing First approach.¹¹

Despite the desire of most homeless individuals to be housed, the transition from the street into housing may be difficult. At a minimum, it means changing basic habits about eating, sleeping and co-existing with other people. These changes may well be challenging for an individual who is mentally and physically ill, addicted, and wary of the intentions of others. The immediate engagement of a skilled case manager/housing navigator is critical for helping the individual make this transition.

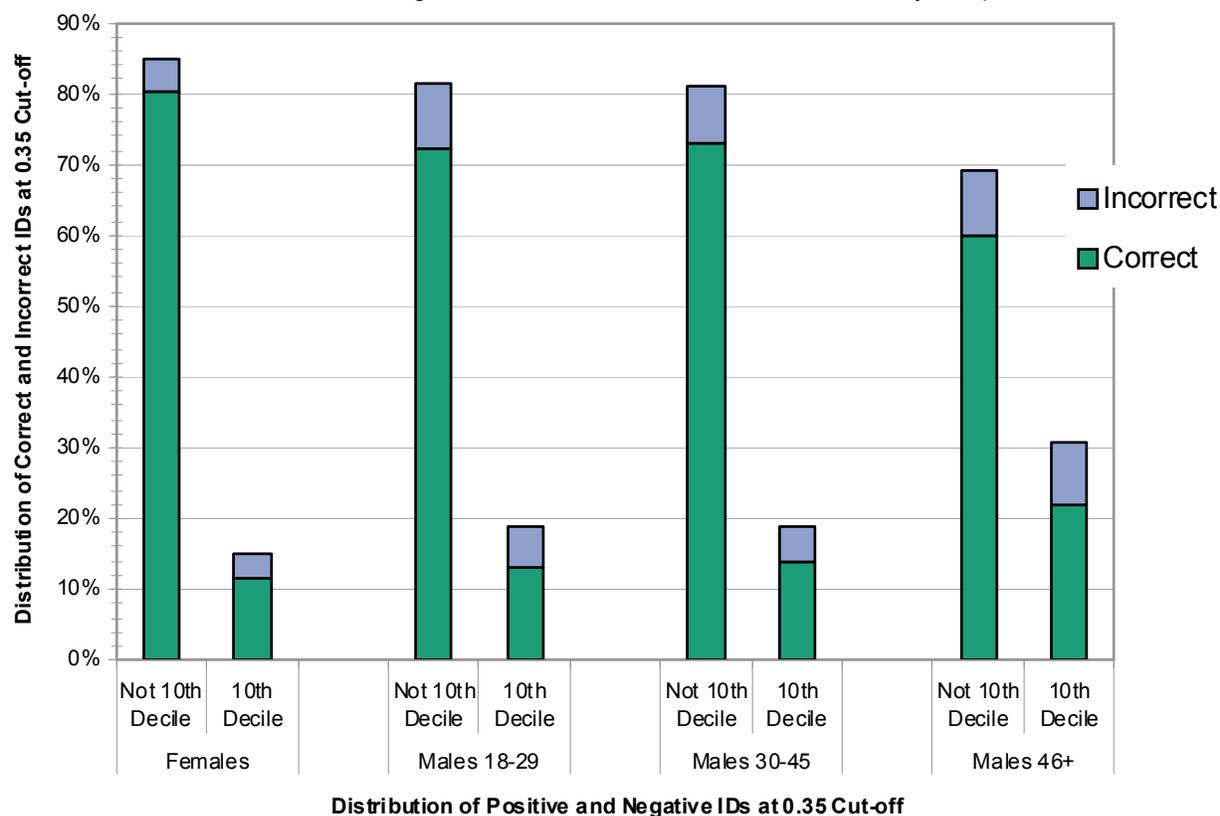
Statistical Appendix

The triage tool uses an array of variables to calculate a regression-based probability that, going forward, a subject homeless person will rank in the top cost-decile. If the probability exceeds a pre-specified threshold, the tool’s user then may recommend that homeless person as a candidate for support.

When tested using the 2,907 records in the analysis sample of homeless individuals treated by the Los Angeles County Department of Health Services, triage tool II is slightly less accurate than triage tool I, released in 2011, which uses jail data and is described in the paper titled, “*Crisis Indicator: Triage Tool for Identifying Homeless Adults in Crisis.*” However, when reliable information about an individual’s incarceration history is *not* available, triage tool II is the more reliable tool.

The new triage tool offers improved reliability for estimates that use only information available to hospitals. When jail information is not available, estimates of 10th decile status produced by triage tool II *mistakenly exclude fewer* individuals who are in the 10th decile, and *mistakenly include fewer* individuals who are not in the 10th decile. Erroneous exclusion is known as *shortfall* or *false negative.*” Erroneous inclusion is known as *burden* or *false positives.*

Figure 11
Distribution of Triage Tool IDs for Homeless Adults Treated by Hospitals



Source: Derived from logistic regressions of records for 2,907 homeless General Relief recipients over 18 years of age with no employment in the past 3 years who were treated at a hospital of Los Angeles County Department of Health Services.

Accuracy of Triage Tool

When screening the entire population of homeless patients treated at hospitals, most of the IDs produced by the triage tool are of people accurately identified as not fitting the profile of patients in the 10th decile. The difficult work of the tool is in differentiating borderline cases just inside or just outside of the 10th decile.

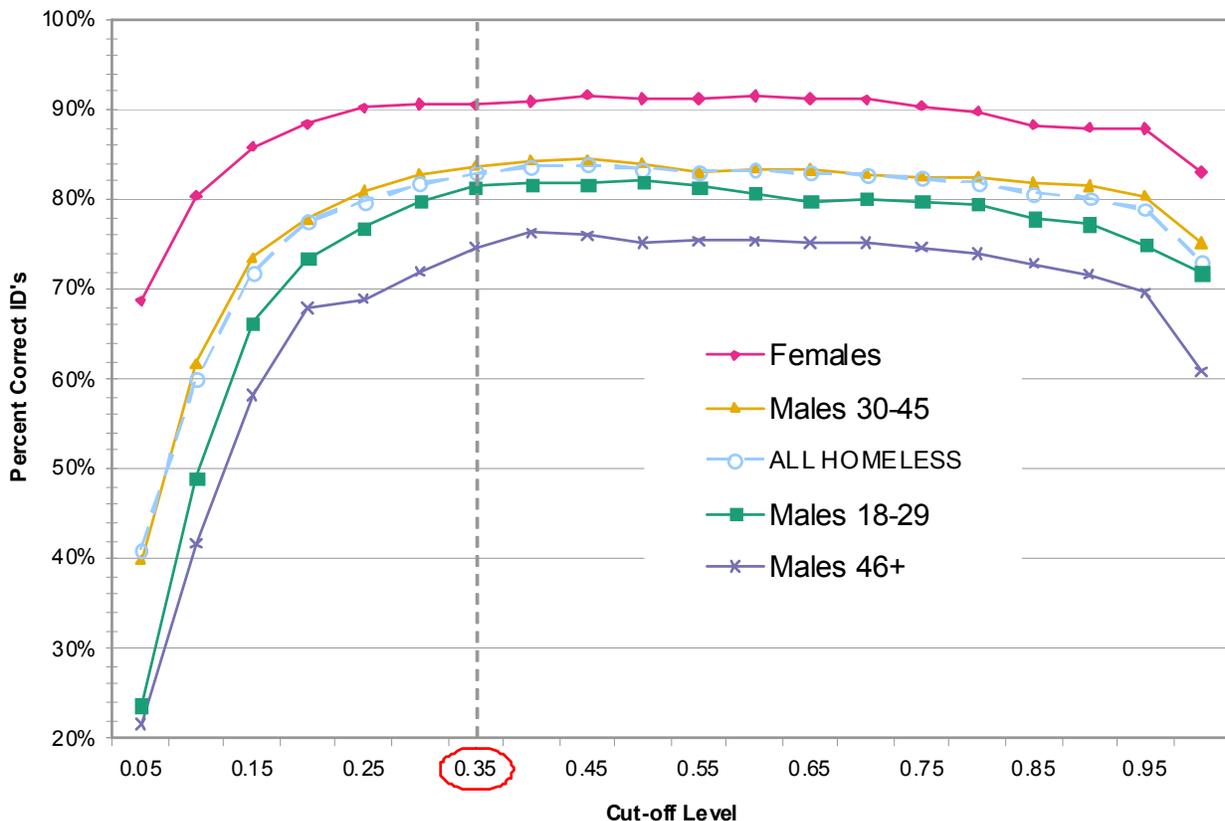
The distribution of determinations about the 10th decile status of patients in each gender/age group, broken out by correct and incorrect IDs at the 0.35 cutoff level, is shown in Figure 11.¹² Most of the estimates are negative and most are correct.

The rate of correct IDs by triage tool II for the 10th decile status of the total population of homeless hospital patients is similar using cutoff levels ranging from 0.35 to 0.70. Throughout this cutoff range, the tool makes correct determinations 83 to 84 percent of the time about whether cases fit the 10th decile profile in the analysis sample, as shown in Figure 12.¹³

Within this plateau range, the rate of correct IDs for the total population is 83.0 percent at the 0.35 cutoff level, peaking at 83.9 percent correct IDs at the 0.45 cutoff and extending to 82.8 percent correct IDs at the 0.70 cutoff.

The tool produces the highest rate of correct IDs for females (91 percent with a 0.35

Figure 12
Rate of Correct 10th Decile IDs of Homeless Hospital Patients by Triage Tool II at Different Cutoff Levels

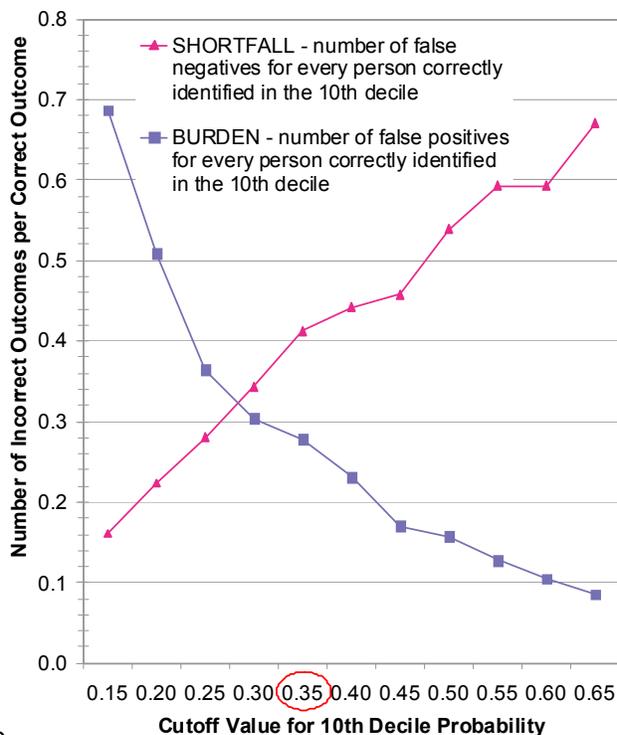


Source: Derived from logistic regressions of records for 2,907 homeless General Relief recipients over 18 years of age with no employment in the past 3 years who were treated at a hospital of Los Angeles County Department of Health Services.

cutoff) and the lowest rate of correct IDs for males 46 years of age or older (75 percent with a 0.35 cutoff). The lower rate of correct IDs for older men may occur because health disorders are more common in this population, making it more difficult to differentiate cases with frequent hospital care. With in the plateau of high correct ID rates in the 0.35 to 0.70 cutoff range, the selection of the best cutoff rate is based on the finding the optimal ratios of false positives and of false negatives to patients correctly identified as fitting the 10th district profile.

Triage tool II uses four separate statistical models for four different groups of homeless adults: females; males, 18 to 29, males, 30 to 45, and males, 46 and older. For three of the four groups, all but older males, a cutoff value of 0.35 produces slightly conservative trade-offs, with the rate of false

Figure 13
Cutoff Values for Assigning Women to 10th Decile

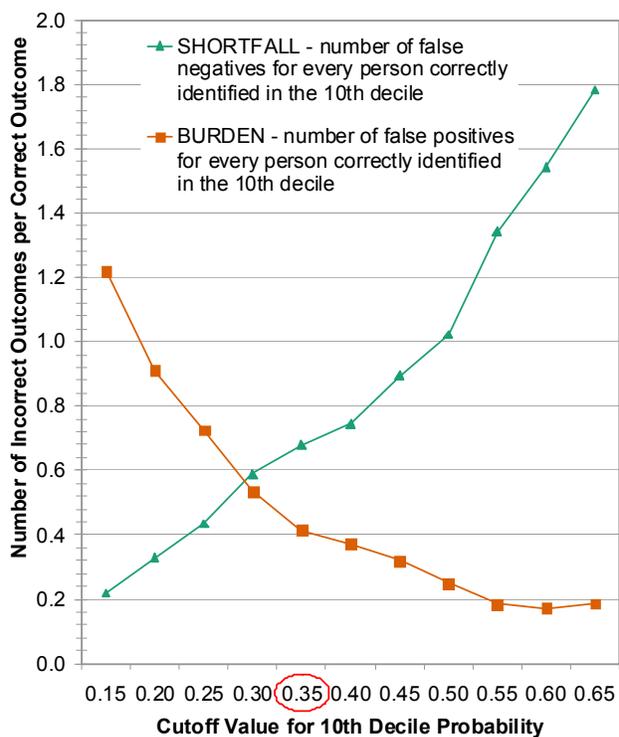


Source: Derived from logistic regressions of records for 2,907 homeless General Relief recipients over 18 years of age with no employment in the past 3 years who were treated at a hospital of Los Angeles County Department of Health Services.

negatives exceeding the rate of false positives. For men 46 and older, the rates of false negatives and false positives are equal at the 0.35 cutoff. The trade-offs for each group at different cutoff levels are shown in Figures 13-16.

The trade-offs between shortfall and burden at different cutoff points for the probability that *women* are in the 10th cost decile are shown in Figure 13.¹⁴ A low cutoff point creates a disproportionate number of false positives; a high cutoff point creates a disproportionate number of false negatives. The cutoff value that provide the best balance of these trade-offs as well as overall accuracy is 0.35. Using this threshold, triage tool II correctly classifies the 10th decile status of homeless women in the analysis sample 91 percent of

Figure 14
Cutoff Values for Assigning Men 18-29 to 10th Decile

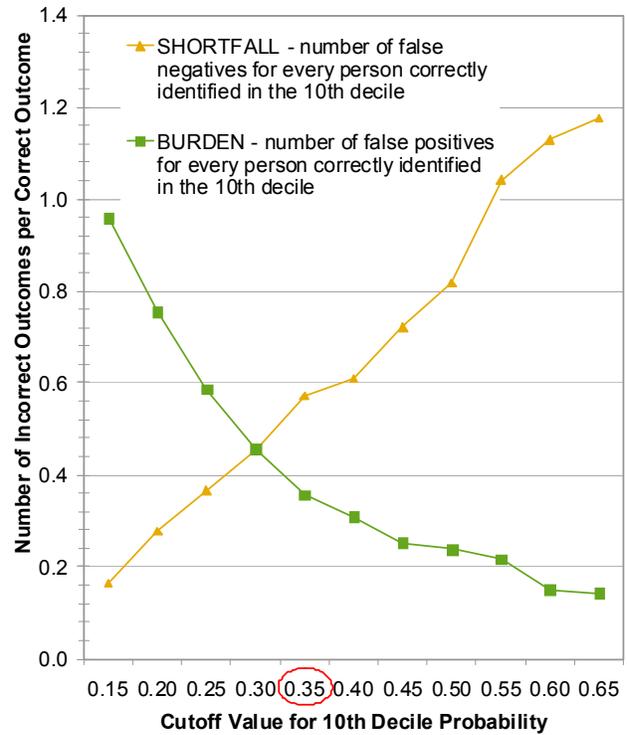


Source: Derived from logistic regressions of records for 2,907 homeless General Relief recipients over 18 years of age with no employment in the past 3 years who were treated at a hospital of Los Angeles County Department of Health Services.

the time. This is the highest rate of accuracy of any group in the model.¹⁵

Young men 18 to 29 years of age are a difficult group to screen for 10th decile status because they represent the most divergent range of possibilities for incurring public costs. These frequently include disruptive or anti-social behavior that results in incarceration in a jail facility, injuries and wounds that result in hospital care, as well as acute mental illness that results in hospital care. Hospital records alone provide a constrained, but still adequate, body of information for estimating the probability that young men are in the 10th decile. The trade-offs between shortfall and burden at different cutoff points for the probability that *men 18-29 years of age* are in the 10th cost decile are shown in Figure 14.¹⁶ Triage tool II correctly classifies the 10th decile status of homeless

Figure 15
Cutoff Values for Assigning Men 30-45 to 10th Decile



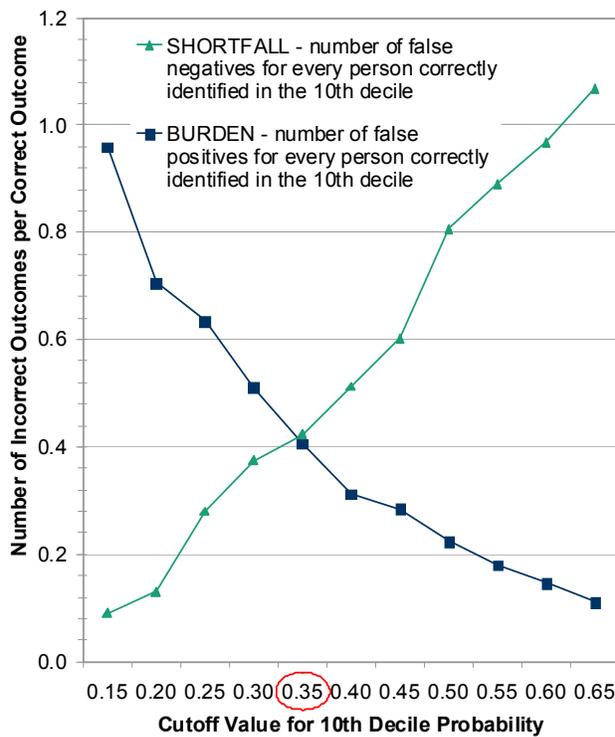
Source: Derived from logistic regressions of records for 2,907 homeless General Relief recipients over 18 years of age with no employment in the past 3 years who were treated at a hospital of Los Angeles County Department of Health Services.

men 18 to 29 years of age 81 percent of the time.

The trade-offs between shortfall and burden at different cutoff points for the probability that *men 30 to 45 years of age* are in the 10th cost decile are shown in Figure 15.¹⁷ Triage tool II correctly classifies the 10th decile status of homeless men 30 to 45 years of age 84 percent of the time.

The trade-offs between shortfall and burden at different cutoff points for the probability that *men 46 years of age and older* are in the 10th cost decile are shown in Figure 16.¹⁸ Triage tool II correctly classifies the 10th decile status of homeless men 46 years of age and older 75 percent of the time, the lowest rate of accuracy of any group in the model.

Figure 16
Cutoff Values for Assigning Men 46+ to 10th Decile



Source: Derived from logistic regressions of records for 2,907 homeless General Relief recipients over 18 years of age with no employment in the past 3 years who were treated at a hospital of Los Angeles County Department of Health Services.

The average rate of accuracy of triage tool II for all four population groups, using a 0.35 cutoff and weighted by the size of each group, is 83 percent. This means that for every six people correctly classified, one person will be incorrectly classified.

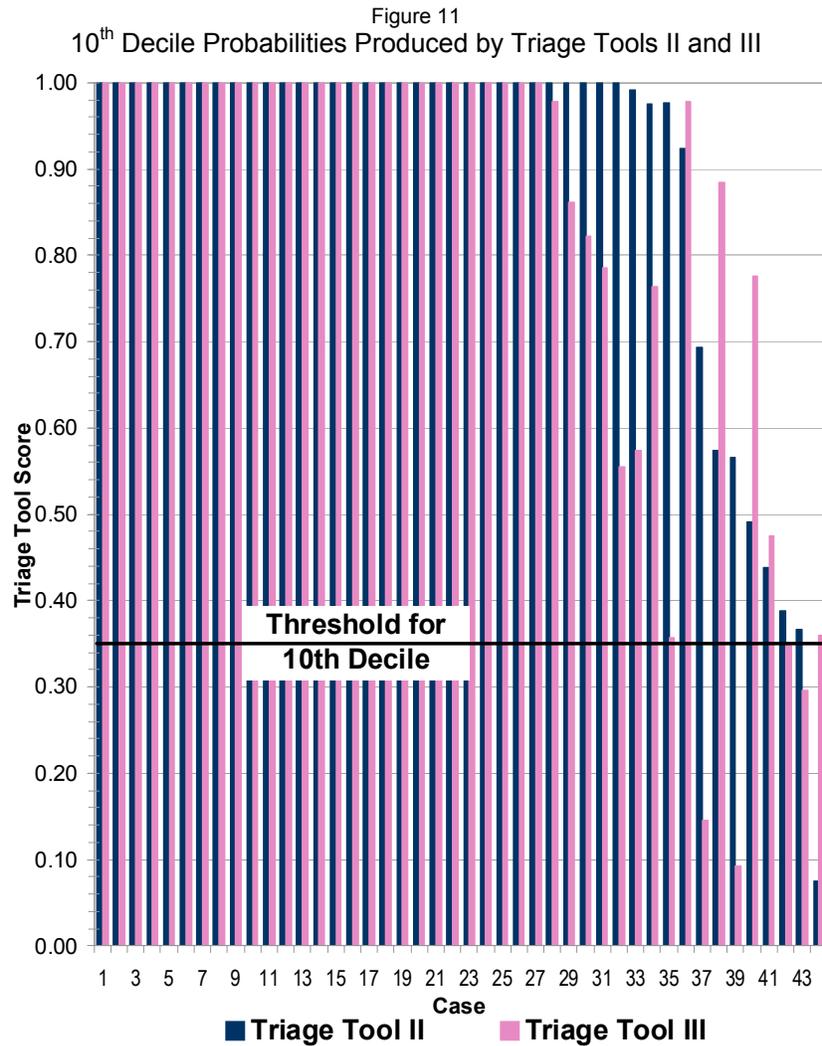
Results from Triage Tool II Compared to Triage Tool I

The probability estimates produced by triage tools II and III for a sample of 44 hospital are shown in Figure 11.

- In 40 of the 44 cases, both tools produced the same outcome – the patient is in the 10th decile.
- In 27 cases, both tools produced identical estimates – probabilities of 1.0 that the patient is in the 10th decile.
- In 8 cases (#28-#35), triage tool I produced a score at or near 1.0, and triage tool II produced a score that was also in the 10th decile (0.35 or higher), but lower. Triage tool I has a tendency to produce low scores until the cutoff threshold is crossed, and after that to produce scores of 1.0. Triage tool II often produced more nuanced intermediate scores.

The four cases where the two tools did not produce the same overall outcome about whether patients are in the 10th decile identify differing strengths of the two tools.

- *Case #37* – African American male age 46+ with nonorganic psychosis, nervous system conditions, and musculoskeletal conditions with 4 emergency room visits, 2 inpatient admissions for a total of 2 days, and 120 days incarcerated in a general jail facility in the past two years. Triage tool I (score 0.69) responds to jail incarceration whereas triage tool II (score 0.15) does not use jail data. Triage tool I is the correct tool for this case.



Source: 44 hospital patients screened by the Economic Roundtable.

- *Case #39* – Male age 30-45, born in another country, with substance abuse problem, HIV disease, alcohol induced mental illness, drug induced mental illness, and schizophrenia with 5 emergency room visits and 450 days incarcerated in a general jail facility in the past two years. Triage tool I (score 0.57) responds to jail incarceration whereas triage tool II (score 0.09) does not use jail data. Triage tool I is the correct tool for this case.
- *Case #43* – Male age 46+ with substance abuse problem, mental health disorder, chronic pulmonary disease, and digestive system disorder with 2 emergency room visits, and 2 inpatient admissions for a total of 7 days in the past two years. Triage tool I (score 0.37) is slightly more responsive to this particular framing demographic and health attributes than triage tool II (score 0.30), which also takes gender into account. This is a borderline case. With triage tool II, if the person were a woman rather than a man, the score would be 0.55. If the person were a man age 18 to 29, the score would be 0.49. If the person were a man age 30 to 45, the score would be 0.26. Triage tool II is capturing more effects from gender-age differences, and probably producing the most accurate result.
- *Case #44* – Woman with hypertension and musculoskeletal conditions, 1 emergency room visit and 2 inpatient admissions for a total of 6 days in the past two years. Triage tool II (score 0.36) is more sensitive to health conditions alone than triage tool I (score 0.08). Triage tool II is the correct tool for this case.

These cases validate the guidance that triage tool I should be used when both jail and hospital data are available, and triage tool II should be used when only hospital data is available.

Steps in Developing Triage Tool II

Individuals in the highest cost decile can be partially differentiated from other homeless residents based on having been an inpatient in a hospital (852 percent more frequent than non-hospitalized persons) or a visitor to an emergency room (216 percent more frequent than non-ER visitors). In addition, nearly all individuals in the highest cost decile are between the ages of 18 and 64, and do not have a recent work history.

To develop triage tools II and III, the population of 9,186 individuals who experienced an interval of homelessness in the database created through Los Angeles County's Enterprise Linkages Project was reduced to a population of 2,907 individuals. All of the 2,907 were 18 to 64 years of age, had not worked in the past three years, and had been an inpatient or emergency room patient at a county hospital. This means that data about medical diagnoses and county health facility usage were available for everyone in the analysis sample that was used to develop both triage tools II and III.

Average monthly costs for the decile groups used in triage tools II and III are based on costs in all months of sampling, not just homeless months. This decile structure most accurately reflects data that can be obtained when using the triage tool to screen homeless adults.

Developing triage tool II entailed the three steps explained below to identify variables to be used in the model, identify homeless groups to be separately addressed in the modeling, and then to determine what pieces of information should be used for each group.

1. *Identify Possible Additional Variables for Use in Tool*

An expanded range of medical and demographic variables was developed and reviewed for use in the tool II model. This included a wider range and more detailed division of medical conditions. It also included demographic and personal attributes not used for tool I: gender, place of birth, language, ethnicity, and substance abuse status.

2. *Determine Groups to be Partitioned into Separate Models within Tool*

Attributes for major groups within the homeless adult population that are associated with differing levels of risk for being in the 10th cost decile were identified and analyzed. These included mental illness, disability, sex, age, and place of birth. Particular attention was paid to sex and age since these distinctions can readily be made with few errors.

Stepwise logistic regressions were performed using STATA, subject to a .05-significance inclusion rule for regression coefficients.

Also, the reliability of each variable for each potential group to be partitioned in the model was tested by tabulating the true-positives, false-negatives, and false-positives for each model using probability ≥ 0.50 as the probability cutoff.

The models were also examined using goodness-of-fit tests and some joint testing of specific variable sets. Filtering was then used to identify specific cases in the sample that had a disproportionate influence on model results. This included assigning 61 especially costly 'certainty' cases to the 10th decile before modeling. These certainty cases included patients with 50 or more outpatient clinic visits in the past 24 months, 20 or more emergency room visits, 5 or more inpatient admissions, or 50 or more inpatient days.

Statistical anomalies found in the initial models were reduced or eliminated by applying tighter specifications. This resulted in a framework with four partitions, one for females, and three for males broken out into three age groups – 18 to 29, 30 to 45, and 46 or older.

Table 1
Model Results for Dataset Partitions

	Females		Males		Total
	18-29	30-45	46+		
Sample Size	812	399	882	751	2,844
R-square	0.52	0.32	0.38	0.35	
Number true positives	72	43	90	110	376
Number false negatives	48	45	89	108	290
Number false positives	14	11	26	30	81
% of errors that are false positives	67%	105%	99%	98%	77%
% of errors that are false negatives	19%	26%	29%	27%	22%
Total Correct	750	343	767	613	2,473
Percent Correct	92%	86%	87%	82%	87%
P>chi2	0.0000	0.0000	0.0000	0.0000	
pseudo R2	0.52	0.32	0.38	0.35	

The model results for dataset partitions are shown in Table 1. Each partition has a different regression model. True-positives, false-negatives, and false-positives shown in Table 2 result from using STATA with 0.50 as the probability-cutoff.

3. *Specify Variables for Use in Each Partition*

The models were created using what amounts to manual reverse stepwise

regression. That is, the first iteration began by specifying almost all the variables in the dataset except for some that are statistically redundant and a few that we specifically decided to omit because they appear unreliable (these include veteran and chronic homeless status). After the initial regression was run, the variables that gave coefficients with the highest p-values were removed. This process was repeated multiple times until the remaining variables had individual p-values of 0.15 or less. Then, the joint significance of variable groups that might have an interactive effect was tested.

Selection of variables for each model was carried out so as to maximize model R-square, maximize significance of individual variables, and maximize joint significance of variable groupings

If the joint p-value for a variable group was very small, a higher p-value was tolerated for the individual variables. The model was culled until all remaining variables had individual or joint p-values less than 0.12. Permitting $p=0.12$ might seem inordinately loose for modeling, but the intent here was to foster a diverse variable set that would help keep the model robust over time.

A separate logistic regression model was specified for females, and for each male age-group: 18-29, 30-45, 46 or older.

The models have the following form:

$$\Pr[\text{case is in 10th decile}] = e^z / (1 + e^z), \text{ where } z = B + \text{SUM}[B_i X_i],$$

where B is constant and B_i are coefficients for respective independent variables.

For each model partition, the initial list of candidate variables was intuitive, but final selection depended on the strength of their regression coefficients, as measured by the respective p-values. Note that some variables appear twice, both squared and not-squared, in order to model curved logarithmic effects.

Overall model statistics for partitions: pseudo R2 that measures goodness-of-fit; p-value for chi-square test that model provides no information; percent of sample correctly identified as 10th decile or not, using $\Pr=0.5$ as cutoff criterion.

Statistics for individual variables in Tables 3 to 6 include:

- odds ratio, which measures the proportional change in odds for a positive result (i.e., decile=10th) for each unit change in the respective variable;
- estimated logistic regression coefficient;
- 95% confidence interval for the coefficient;
- p-value that results from testing whether coefficient=0.0 (or equivalently, whether odds ratio = 1.0).

Some variables that produced intolerably high p-values were found to be tolerable when tested for joint effect with related variables; these joint p-values are shown in a separate column.

Table 2
Model for Females

CURRENT STATUS:	odds ratio	coeff.	[.95% conf. interval]	P> z	joint P> z		
Language not English	0.132	-2.026	-7.300	3.249	0.452		
Disabled	1.852	0.616	-0.029	1.261	0.061		
SubstanceAbuse	1.443	0.367	-0.618	1.352	0.466		
Mental+SubstanceAbuse	3.669	1.300	0.275	2.325	0.013		
001-139 Infections&Parasitic	0.460	-0.776	-1.845	0.293	0.155		
042 HIV Disease	16.245	2.788	0.083	5.493	0.043		
250 Diabetes	1.682	0.520	-0.741	1.781	0.419		
280-289 Blood&BloodOrgans	4.871	1.583	-0.114	3.281	0.068		
290-319 MentalHealthDisorders	2.051	0.718	-0.130	1.567	0.097		0.171
291 Alcohol-induced MI	0.042	-3.162	-8.411	2.088	0.238		
292 Drug-induced MI	2.949	1.081	-0.451	2.613	0.167		
295 SchizophrenicDisorders	1.350	0.300	-2.096	2.696	0.806		
296 EpisodicMoodDisorders	0.746	-0.293	-1.299	0.713	0.568		
320-389 NervousSystem	2.114	0.749	-0.080	1.577	0.077		
390-459 CirculatorySystem	3.277	1.187	-1.293	3.667	0.348	0.033	
401-405 HypertensiveDisease	1.017	0.016	-2.509	2.541	0.990		
410-414 IschemicHeartDisease	0.097	-2.337	-5.125	0.452	0.100		
420-429 OtherHeartDisease	0.006	-5.088	-9.224	-0.952	0.016		
451-459 Vein&lymphaticsDisease	1.432	0.359	-2.714	3.432	0.819		
460-519 RespiratorySystem	0.795	-0.230	-1.812	1.352	0.776	0.069	
460-466 RespiratoryInfections	1.586	0.461	-0.970	1.892	0.527		
470-478 OtherDiseaseUpperRespTract	1.036	0.035	-1.538	1.609	0.965		
480-488 Pneumonia&Influenza	9.518	2.253	0.488	4.018	0.012		
490-496 ChronicPulmonaryDisease	1.403	0.339	-0.995	1.672	0.619		
580-629 GenitourinarySystem	1.693	0.526	-0.449	1.501	0.290		
590-599, 614-616 UrinaryDisease	0.637	-0.452	-1.710	0.806	0.482		
680-709 Skin&Subcutaneous	2.434	0.889	-0.177	1.956	0.102		
681-682 Cellulitis	0.450	-0.800	-2.053	0.454	0.211		
780-799 Ill-definedConditions	0.243	-1.416	-2.233	-0.600	0.001		
V01-V89 FactorsInfluencingHealth	1.286	0.252	-0.489	0.993	0.506		
IN PAST 3 YEARS:							
ER User in Past 3 Yrs	0.586	-0.534	-1.542	0.474	0.299		
HospitalInpatient in Past 3 Yrs	0.392	-0.937	-2.956	1.082	0.363		
IN PAST 2 YEARS:							
# OutpatientAdmissions, 24 Mnths	0.765	-0.268	-0.474	-0.061	0.011	0.000	

OutpatientAdmissions, squared	1.000	0.000	-0.007	0.006	0.979	
# InpatientAdmissions, 24 Mnths	3.842	1.346	-1.791	4.483	0.400	0.013
InpatientAdmissions, squared	1.081	0.078	-1.020	1.176	0.890	
# DaysHospitalized, 24 Mnths	1.165	0.152	-0.029	0.334	0.099	0.000
DaysHospitalized, squared	1.004	0.004	-0.001	0.009	0.155	

Constant	-4.095	-5.160	-3.030	0.000
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Table 3
Model for Males 18 to 29 Years of Age

CURRENT STATUS:	odds ratio	coeff.	[.95% conf. interval]	P> z	joint P> z		
BornOtherState	1.898	0.641	-0.343	1.625	0.202		
BornOtherCountry	0.027	-3.625	-7.416	0.166	0.061		
AfricanAmerican	1.372	0.316	-0.373	1.005	0.369		
Disabled	1.400	0.337	-0.334	1.008	0.325		
SubstanceAbuse	0.622	-0.475	-1.745	0.795	0.464		
Mental+SubstanceAbuse	4.342	1.468	0.042	2.894	0.044		
001-139 Infections&Parasitic	1.575	0.454	-0.748	1.656	0.459		
140-239 Neoplasms	0.393	-0.935	-3.947	2.078	0.543		
280-289 Blood&BloodOrgans	3.864	1.352	-1.412	4.115	0.338		
290-319 MentalHealthDisorders	1.596	0.467	-0.491	1.426	0.339		0.164
291 Alcohol-induced MI	0.168	-1.783	-4.598	1.032	0.214		
292 Drug-induced MI	0.275	-1.292	-3.142	0.558	0.171		
295 SchizophrenicDisorders	1.455	0.375	-1.406	2.156	0.680		
298 OtherNonorganicPsychoses	0.446	-0.807	-2.025	0.411	0.194		
311 OtherDepressiveDisorders	2.934	1.076	-0.482	2.635	0.176		
320-389 NervousSystem	1.689	0.524	-0.662	1.710	0.386		
390-459 CirculatorySystem	0.151	-1.889	-3.695	-0.084	0.040		
460-519 RespiratorySystem	2.960	1.085	-0.739	2.909	0.244		
460-466 RespiratoryInfections	0.158	-1.842	-3.940	0.256	0.085		
490-496 ChronicPulmonaryDisease	0.294	-1.225	-3.241	0.790	0.233		
520-579 DigestiveSystem	0.538	-0.620	-1.602	0.362	0.216		
580-629 GenitourinarySystem	0.303	-1.193	-3.259	0.873	0.258		
IN PAST 3 YEARS:							
ER User in Past 3 Yrs	0.443	-0.813	-1.861	0.234	0.128		
HospitalInpatient in Past 3 Yrs	1.551	0.439	-0.747	1.624	0.468		
IN PAST 2 YEARS:							
# OutpatientAdmissions, 24 Mnths	0.658	-0.419	-0.794	-0.044	0.028	0.052	

OutpatientAdmissions, squared	1.010	0.010	-0.005	0.024	0.186	
# InpatientAdmissions, 24 Mnths						
InpatientAdmissions, squared						
# ER Admissions, 24 Mnths	1.493	0.401	-0.275	1.076	0.245	
ER Admissions, squared	0.940	-0.062	-0.138	0.015	0.115	
# DaysHospitalized, 24 Mnths	1.427	0.355	0.057	0.654	0.020	0.003
DaysHospitalized, squared	0.997	-0.003	-0.012	0.005	0.444	

Constant	-2.377	-3.380	-1.375	0.000
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Table 4
Model for Males 30 to 45 Years of Age

CURRENT STATUS:	odds ratio	coeff.	[.95% conf. interval]	P> z	joint P> z	
BornOtherState	1.181	0.166	-0.326	0.658	0.508	
AfricanAmerican	2.431	0.888	0.418	1.358	0.000	
Disabled	1.489	0.398	-0.056	0.853	0.086	
SubstanceAbuse	0.787	-0.240	-0.945	0.466	0.505	
ChronicCondition (HCUP)	0.532	-0.630	-1.360	0.099	0.090	
Mental+SubstanceAbuse	2.550	0.936	0.156	1.716	0.019	
001-139 Infections&Parasitic	0.679	-0.387	-1.282	0.507	0.396	
140-239 Neoplasms	2.731	1.005	-0.757	2.767	0.264	
240-279 Endocrine&Metabolic&Immune	1.843	0.612	-0.366	1.589	0.220	
280-289 Blood&BloodOrgans	0.002	-6.485	-27.786	14.816	0.551	
290-319 MentalHealthDisorders	3.231	1.173	0.228	2.118	0.015	0.083
291 Alcohol-induced MI	0.234	-1.454	-3.374	0.466	0.138	
292 Drug-induced MI	0.645	-0.438	-1.750	0.874	0.513	
295 SchizophrenicDisorders	0.672	-0.397	-1.805	1.010	0.580	
296 EpisodicMoodDisorders	0.646	-0.437	-1.340	0.465	0.342	
298 OtherNonorganicPsychoses	1.499	0.404	-0.432	1.241	0.343	
311 OtherDepressiveDisorders	0.813	-0.207	-1.338	0.925	0.720	
390-459 CirculatorySystem	6.448	1.864	-0.510	4.238	0.124	0.200
401-405 HypertensiveDisease	0.322	-1.132	-3.575	1.311	0.364	
410-414 IschemicHeartDisease	0.106	-2.245	-6.818	2.329	0.336	
420-429 OtherHeartDisease	0.042	-3.168	-7.651	1.314	0.166	
451-459 Vein&lymphaticsDisease	0.005	-5.251	-10.816	0.315	0.064	
460-519 RespiratorySystem						0.156
460-466 RespiratoryInfections	1.322	0.279	-0.595	1.153	0.532	
490-496 ChronicPulmonaryDisease	0.302	-1.196	-2.491	0.099	0.070	

520-579 DigestiveSystem	0.527	-0.640	-1.238	-0.043	0.036	
590-599, 614-616 UrinaryDisease	0.221	-1.511	-3.827	0.806	0.201	
680-709 Skin&Subcutaneous	1.566	0.448	-0.445	1.342	0.325	0.496
681-682 Cellulitis	0.537	-0.621	-1.653	0.411	0.238	
710-739 MusculoskeletalSystem	0.494	-0.705	-1.343	-0.068	0.030	
800-999 Injury&Poisoning	1.835	0.607	0.135	1.079	0.012	

IN PAST 3 YEARS:

ER User in Past 3 Yrs	1.681	0.519	-0.381	1.420	0.258	
HospitalInpatient in Past 3 Yrs						

IN PAST 2 YEARS:

# OutpatientAdmissions, 24 Mnths	0.868	-0.142	-0.354	0.071	0.191	0.001
OutpatientAdmissions, squared	0.992	-0.008	-0.017	0.001	0.065	
# InpatientAdmissions, 24 Mnths	3.086	1.127	0.331	1.923	0.006	
# ER Admissions, 24 Mnths	1.484	0.395	-0.045	0.834	0.079	
ER Admissions, squared	0.950	-0.051	-0.103	0.002	0.057	0.000
# DaysHospitalized, 24 Mnths	1.028	0.028	-0.174	0.230	0.785	
DaysHospitalized, squared	1.011	0.011	0.003	0.019	0.005	

Constant	-3.870	-4.835	-2.904	0.000
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Table 5
Model for Males 46 Years of Age or Older

CURRENT STATUS:

	odds ratio	coeff.	[.95% conf. interval]	P> z	joint P> z	
BornOtherState	0.791	-0.235	-0.674 0.204	0.294		
BornOtherCountry	0.441	-0.820	-1.964 0.325	0.160		
Language not English	0.599	-0.513	-2.349 1.323	0.584		
AfricanAmerican	1.638	0.493	0.031 0.955	0.036		
Disabled	1.450	0.372	-0.092 0.835	0.116		
SubstanceAbuse	0.605	-0.503	-1.107 0.102	0.103		
Mental+SubstanceAbuse	3.738	1.318	0.576 2.061	0.001		
042 HIV Disease	1.911	0.648	-1.420 2.715	0.539		
250 Diabetes	0.553	-0.592	-1.509 0.324	0.205		
280-289 Blood&BloodOrgans	0.441	-0.819	-2.430 0.792	0.319		
290-319 MentalHealthDisorders	1.124	0.117	-0.761 0.994	0.795		0.083
291 Alcohol-induced MI	0.142	-1.954	-3.527 -0.380	0.015		
292 Drug-induced MI	0.710	-0.343	-1.849 1.163	0.655		
295 SchizophrenicDisorders	2.425	0.886	-0.687 2.458	0.269		
296 EpisodicMoodDisorders	0.676	-0.392	-1.468 0.684	0.475		

298 OtherNonorganicPsychoses	0.385	-0.954	-2.141	0.234	0.116	
311 OtherDepressiveDisorders	0.355	-1.036	-2.472	0.400	0.157	
390-459 CirculatorySystem	0.359	-1.025	-2.354	0.303	0.130	0.441
401-405 HypertensiveDisease	2.116	0.750	-0.547	2.047	0.257	
410-414 IschemicHeartDisease	1.538	0.431	-0.930	1.791	0.535	
420-429 OtherHeartDisease	1.599	0.469	-0.871	1.810	0.492	
451-459 Vein&lymphaticsDisease	6.360	1.850	0.126	3.574	0.035	
460-519 RespiratorySystem						0.166
460-466 RespiratoryInfections	0.798	-0.226	-1.000	0.549	0.568	
470-478 OtherDiseaseUpperRespTract	3.110	1.135	-0.073	2.342	0.065	
580-629 GenitourinarySystem	0.618	-0.481	-1.233	0.271	0.210	
680-709 Skin&Subcutaneous	1.228	0.205	-0.621	1.031	0.626	0.305
681-682 Cellulitis	1.306	0.267	-0.698	1.232	0.588	
710-739 MusculoskeletalSystem	0.528	-0.638	-1.153	-0.123	0.015	
780-799 Ill-definedConditions	1.349	0.300	-0.175	0.775	0.216	
800-999 Injury&Poisoning	1.426	0.355	-0.088	0.798	0.116	
V01-V89 FactorsInfluencingHealth	0.838	-0.177	-0.642	0.289	0.457	

IN PAST 3 YEARS:

ER User in Past 3 Yrs	2.220	0.798	-0.180	1.775	0.110	
HospitalInpatient in Past 3 Yrs	1.195	0.178	-0.451	0.806	0.579	

IN PAST 2 YEARS:

# OutpatientAdmissions, 24 Mnths	0.924	-0.079	-0.237	0.079	0.328	0.000
OutpatientAdmissions, squared	0.992	-0.008	-0.015	-0.001	0.029	
# InpatientAdmissions, 24 Mnths						
InpatientAdmissions, squared	1.238	0.214	-0.136	0.564	0.231	
# ER Admissions, 24 Mnths	1.200	0.182	-0.100	0.464	0.205	0.135
ER Admissions, squared	0.981	-0.020	-0.040	0.001	0.058	
# DaysHospitalized, 24 Mnths	1.108	0.103	-0.041	0.246	0.161	0.000
DaysHospitalized, squared	1.006	0.006	0.001	0.010	0.020	

Constant	-3.340	-4.413	-2.267	0.000
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Patient Screening Appendix

10th Decile Screening Form for Homeless Patients

Patient Name: *Leave Blank when De-identified* Date of Birth: _____ Place of Birth: _____
Staff Name: _____ Today's Date: _____ Hospital/Clinic: _____
Staff Phone: _____ Patient Room/Location: _____

I. Eligibility

Is this patient homeless? Yes No Don't Know

A person who is homeless lacks a fixed, regular, and adequate nighttime residence; and has a primary nighttime residence that is:

- *A supervised publicly or privately operated shelter designed to provide temporary living accommodations (including welfare/voucher hotels, shelters, or transitional housing designed for homeless persons); or*
- *An institution that provides a temporary residence for persons intended to be institutionalized; or*
- *A public or private place not designed for, or ordinarily used as, a regular sleeping accommodation for human beings (street, park, hallway, freeway underpass.)*

Individuals are ineligible for permanent supportive housing (and this pilot program) if any of the following attributes apply to them. Do any of the following describe this patient:

- | | | |
|----------------------------------------------------------------------|------------------------------|-----------------------------|
| 1. Undocumented immigrant? | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| 2. On parole for a violent crime? | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| 3. Convicted of arson? | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| 4. Convicted of operating a methamphetamine lab? | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| 5. Committed an offense that requires registering as a sex offender? | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| 6. Needs continuing nursing care? | <input type="checkbox"/> yes | <input type="checkbox"/> no |

If none of the above attributes apply to the patient, please continue by providing the following information.

II. General Information

Gender?	<input type="checkbox"/> Male <input type="checkbox"/> Female	Ethnicity?	<input type="checkbox"/> African American <input type="checkbox"/> Asian <input type="checkbox"/> Caucasian <input type="checkbox"/> Latino <input type="checkbox"/> Pacific Islander <input type="checkbox"/> Other _____
Language?	<input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Other _____		
Veteran?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	Alcohol or drug dependency?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know

III. Diagnostic Information

Instructions: Please review the patient's medical records and check (☑) all diagnoses that apply. Check only the diagnoses in **bold** with check boxes next to them; the others are for reference.

Once completed, please email or fax [fax number] this form to [name of screening organization].

<input checked="" type="checkbox"/>	Group	Sub-Group	ICD-9-CM Code and Name of Principal Diagnosis	Version of Triage Tool	Chronic
<input type="checkbox"/>	1. INFECTIOUS AND PARASITIC DISEASES (001-139)			2	
<input type="checkbox"/>		011 Pulmonary Tuberculosis		*	*
<input type="checkbox"/>		042 Human Immunodeficiency Virus (HIV) Infection		2	c
<input type="checkbox"/>	2. NEOPLASMS (140-239)			2	c
<input type="checkbox"/>	3. ENDOCRINE, NUTRITIONAL AND METABOLIC DISEASES, & IMMUNITY DISORDERS (240-279)			2	
<input type="checkbox"/>		250 Diabetes mellitus		2	c
<input type="checkbox"/>	4. DISEASES OF THE BLOOD AND BLOOD-FORMING ORGANS (280-289)			2	c
<input type="checkbox"/>	5. MENTAL DISORDERS (290-319)			1	2
<input type="checkbox"/>		Psychoses (290-299)		1	
		<i>Organic Psychotic Conditions (290-294)</i>			
<input type="checkbox"/>		291 Alcohol-induced mental disorders		1	2 c
<input type="checkbox"/>		292 Drug-induced mental disorders		1	2 c
<input type="checkbox"/>		Other Psychoses (295-299)			c
<input type="checkbox"/>		295 Schizophrenic disorders		2	c
<input type="checkbox"/>		296 Episodic mood disorders		2	c
<input type="checkbox"/>		298 Other nonorganic psychoses		2	c
<input type="checkbox"/>		Neurotic Disorders, Personality Disorders, & Other Nonpsychotic Mental Disorders (300-316)		1	
		<i>300 Anxiety, dissociative and somatoform disorders</i>			c
<input type="checkbox"/>		303 Alcohol dependence syndrome		2	c
<input type="checkbox"/>		304 Drug dependence		2	c
		<i>305 Nondependent abuse of drugs</i>			c
		<i>309 Adjustment reaction</i>			c
<input type="checkbox"/>		311 Depressive disorder, not elsewhere classified		2	c
		<i>Mental Retardation (317-319)</i>			c
<input type="checkbox"/>	6. DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS (320-389)			1	2
		<i>Hereditary & Degenerative Diseases of the Central Nervous System (330-337)</i>			c
		<i>Pain (338)</i>			
		<i>338 Pain, not elsewhere classified</i>			c
		<i>Other Disorders of the Central Nervous System (340-349)</i>			
		<i>345 Epilepsy & Recurrent Seizures</i>			c
		<i>Disorders of the Eye And Adnexa (360-379)</i>			
		<i>368 Visual Disturbances</i>			
		<i>372 Disorders of Conjunctiva</i>			
		<i>Diseases of the Ear And Mastoid Process (380-389)</i>			
		<i>380 Disorders of external ear</i>			
<input type="checkbox"/>	7. DISEASES OF THE CIRCULATORY SYSTEM (390-459)			1	2

<input checked="" type="checkbox"/>	Group	Sub-Group	ICD-9-CM Code and Name of Principal Diagnosis	Version of Triage Tool	Chronic
<input type="checkbox"/>			Chronic Rheumatic Heart Disease (393-398)		
<input type="checkbox"/>			Hypertensive Disease (401-405)	1	2
			401 Essential hypertension		C
			403 Hypertensive chronic kidney disease		C
<input type="checkbox"/>			Ischemic Heart Disease (410-414)	2	
			410 Acute myocardial infarction		C
			411 Other acute and subacute forms of ischemic heart disease		C
			414 Other forms of chronic ischemic heart disease		C
			<i>Diseases of Pulmonary Circulation (415-417)</i>		
<input type="checkbox"/>			Other Forms of Heart Disease (420-429)	2	
<input type="checkbox"/>			427 Cardiac dysrhythmias	*	* C
			428 Heart failure		C
			<i>Cerebrovascular Disease (430-438)</i>		C
			<i>Diseases of Arteries, Arterioles, & Capillaries (440-449)</i>		C
<input type="checkbox"/>			Diseases of Veins & Lymphatics, & Other Diseases of Circulatory System (451-459)	2	
<input type="checkbox"/>			453 Other venous embolism and thrombosis	*	*
<input type="checkbox"/>			8. DISEASES OF THE RESPIRATORY SYSTEM (460-519)	1	2
<input type="checkbox"/>			Acute Respiratory Infections (460-466)	2	
			462 Acute pharyngitis		
			465 Acute upper respiratory infections of multiple or unspecified sites		
			466 Acute bronchitis and bronchiolitis		
<input type="checkbox"/>			Other Diseases of the Upper Respiratory Tract (470-478)	2	
			473 Chronic sinusitis		C
<input type="checkbox"/>			Pneumonia & Influenza (480-488)	2	
			486 Pneumonia, organism unspecified		
<input type="checkbox"/>			Chronic Obstructive Pulmonary Disease & Allied Conditions (490-496)	2	
			490 Bronchitis, not specified as acute or chronic		
			491 Chronic bronchitis		C
<input type="checkbox"/>			493 Asthma	1	C
			<i>Other Diseases of Respiratory System (510-519)</i>		
			511 Pleurisy		
<input type="checkbox"/>			9. DISEASES OF THE DIGESTIVE SYSTEM (520-579)	1	2
			<i>Diseases of Oral Cavity, Salivary Glands, & Jaws (520-529)</i>		
			521 Diseases of hard tissues of teeth		
			522 Diseases of pulp and periapical tissues		
			525 Other diseases and conditions of the teeth and supporting structures		
			<i>Diseases of Esophagus, Stomach, & Duodenum (530-538)</i>		
			530 Diseases of esophagus		
			535 Gastritis and duodenitis		
			536 Disorders of function of stomach		
			<i>Hernia of Abdominal Cavity (550-553)</i>		
			550 Inguinal hernia		
			553 Other hernia of abdominal cavity without mention of obstruction or gangrene		
			<i>Noninfectious Enteritis & Colitis (555-558)</i>		
			558 Other and unspecified noninfectious gastroenteritis and colitis		

☑	Group	Sub-Group	ICD-9-CM Code and Name of Principal Diagnosis	Version of Triage Tool	Chronic
			<i>Other Diseases of Digestive System (570-579)</i>		
☐			571 Chronic liver disease and cirrhosis	*	* C
			<i>574 Cholelithiasis</i>		
☐			577 Diseases of pancreas	*	*
			<i>578 Gastrointestinal hemorrhage</i>		
☐	10. DISEASES OF THE GENITOURINARY SYSTEM (580-629)				2
☐			Other Diseases of Urinary System (590-599)	1	2
			<i>590 Infections of kidney</i>		
			<i>592 Calculus of kidney and ureter</i>		
			<i>597 Urethritis, not sexually transmitted, and urethral syndrome</i>		
			<i>599 Other disorders of urethra and urinary tract</i>		
☐			Inflammatory Disease of Female Pelvic Organs (614-616)		2
			<i>614 Inflammatory disease of ovary, fallopian tube, pelvic cellular tissue, and peritoneum</i>		
			<i>616 Inflammatory disease of cervix, vagina, and vulva</i>		
☐	12. DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE (680-709)				2
☐			681-682 Cellulitis		2
			<i>683 Acute lymphadenitis</i>		
			<i>686 Other local infections of skin and subcutaneous tissue</i>		
☐	13. DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE (710-739)			1	2
			<i>Arthropathies & Related Disorders (710-719)</i>		C
			<i>715 Osteoarthritis and allied disorders</i>		C
			<i>716 Other and unspecified arthropathies</i>		C
			<i>717 Internal derangement of knee</i>		C
			<i>Dorsopathies (720-724)</i>		
			<i>721 Spondylosis and allied disorders</i>		C
			<i>723 Other disorders of cervical region</i>		
			<i>724 Other and unspecified disorders of back</i>		
			<i>Rheumatism, Excluding the Back (725-729)</i>		
			<i>726 Peripheral enthesopathies and allied syndromes</i>		
			<i>727 Other disorders of synovium, tendon, and bursa</i>		
			<i>728 Disorders of muscle, ligament, and fascia</i>		
			<i>729 Other disorders of soft tissues</i>		
			<i>Osteopathies, Chondropathies, & Acquired Musculoskel. Deformities (730-739)</i>		C
			<i>730 Osteomyelitis, periostitis, and other infections involving bone</i>		
			<i>733 Other disorders of bone and cartilage</i>		
☐	16. SYMPTOMS, SIGNS, AND ILL-DEFINED CONDITIONS (780-799)				2
			<i>780 General symptoms</i>		
			<i>782 Symptoms involving skin and other integumentary tissue</i>		
			<i>784 Symptoms involving head and neck</i>		
			<i>786 Symptoms involving respiratory system and other chest symptoms</i>		
			<i>787 Symptoms involving digestive system</i>		
			<i>789 Other symptoms involving abdomen and pelvis</i>		
☐	17. INJURY AND POISONING (800-999)				2
			<i>815 Fracture of metacarpal bone(s)</i>		
			<i>845 Sprains and strains of ankle and foot</i>		
			<i>873 Other open wound of head</i>		

<input checked="" type="checkbox"/>	Group	Sub-Group	ICD-9-CM Code and Name of Principal Diagnosis	Version of Triage Tool	Chronic
			920 Contusion of face, scalp, and neck except eye(s) 924 Contusion of lower limb and of other and unspecified sites 959 Injury, other and unspecified		
<input type="checkbox"/>			970 Poisoning by central nervous system stimulants		
<input type="checkbox"/>	SUPPLEMENTARY CLASSIFICATION OF FACTORS INFLUENCING HEALTH STATUS AND CONTACT WITH HEALTH SERVICES (V01-V89)				2
			V22 Normal pregnancy V54 Other orthopedic aftercare V58 Encounter for other and unspecified procedures and aftercare V67 Follow-up examination V71 Observation and evaluation for suspected conditions not found V79 Special screening for mental disorders and developmental handicaps		

Triage tool notes:

- Triage tool 1 is for patients for whom the amount of jail time is known
- Triage tool 2 is for patients for whom only hospital and clinic data is available
- Chronic medical conditions are denoted by "c" in the Chronic column
- * Rare diagnoses not listed in either triage tool but associated with a high probability of being in the 10th decile

Main condition treated during this hospital visit? _____

When will this patient be discharged? _____

Does this patient have a disability, that is a physical or mental impairment that substantially limits one or more of the major life activities?

- Yes No Don't Know

Is this patient ambulatory? Yes No Don't Know

Is this patient expected to recover and live independently without continuing nursing care?

- Yes No Don't Know

Will this patient need short-term respite care?

- Yes No Don't Know

The 10th Decile Project places eligible high-need homeless patients temporarily in hotels, and then after the necessary documentation is assembled and approvals obtained, into permanent supportive housing. The project does not currently have access to respite care, recuperative care or skilled nursing beds. To be viable in the program, individuals must be able to live alone in a hotel and then in permanent supportive housing. Health conditions that are barriers to live in the housing that can be provided include:

1. Wheel chair - assistance is not available to move patients into and out of wheel chairs. Patients in wheel chairs are viable for the program only if they are sufficiently ambulatory to be able to get out of the wheel chair and into a taxi, onto a toilet, and into a bed on their own.
2. Colostomy bag

- 3. *Urinary catheter*
- 4. *Tracheotomy*
- 5. *Feeding tube*
- 6. *Ongoing intravenous therapy*
- 7. *Serious wounds that require ongoing wound care*

Does this patient have any of these seven barriers?

Yes **No** **Don't Know**

IV. Hospital Usage and Justice System History

IN THE PAST 3 YEARS:

If possible, provide information about justice system encounters in the past three-years. None of this information excludes the patients from possible housing referral.

Jail or probation record? **Yes** **No** **Don't Know**
Mental health inmate? **Yes** **No** **Don't Know**

IN THE PAST 2 YEARS:

This section on past health care use in the past two-years is extremely important. Please look up this information in patient records.

Outpatient Clinics (#visits) _____ **(all clinics)**
Emergency Room (#visits) _____ **(all hospitals)**
Hospital inpatient (#admissions) _____ **(all hospitals)** **(#days)** _____
Jail (#days) _____ **(all facilities)**
If any of this time was spent at Twin Towers, how many days? _____

Completion

Once completed, please fax [fax number] or email [email address] this form to the [screening organization]. Then call [name of staff] at [screening organization]: [telephone number].

END NOTES

¹ Economic Roundtable (2009), *Where We Sleep: The Costs of Housing and Homelessness in Los Angeles*, pp. 17-18.

² Economic Roundtable (2009), *Where We Sleep: The Costs of Housing and Homelessness in Los Angeles*; and (2010), *Tools for Identifying High-Cost, High-Need Homeless Persons*, www.economicrt.org.

³ Supportive housing is permanent, affordable housing with on-site or readily available case management and additional services such as health, mental health and substance abuse rehabilitation.

⁴ The complex task of linking client records was carried out by the Service Integration Branch of Los Angeles County's Chief Executive Office through its Adult Linkages Project (ALP), now known as the Enterprise Linkages Project (ELP). The study population was made up of 13,176 indigent adults who entered Los Angeles County's General Relief Program over a 6-month period, creating a representative sample of this overall population. This project linked administrative records across eight departments to provide information on client needs, service gaps, service costs, and utilization patterns. The ALP used an anonymous record linkage method that addressed the legal obstacles involved in sharing confidential information by de-identifying personal information.

Seventeen types of costs could be determined for all persons based on data provided by county departments and other agencies:

1. Los Angeles County Department of Health Services hospitals-inpatient
2. Los Angeles County Department of Health Services outpatient clinics
3. Los Angeles County Department of Health Services emergency rooms
4. Private hospitals-inpatient (The estimated use of private hospital facilities is based on 61.95 percent of homeless inpatients or emergency room patients at county hospitals. This is based on hospital discharge records from the California Office of Statewide Health Planning and Development, in which there is a flag for patients who were homeless. OSHPD records were extracted for inpatient hospitalizations of homeless patients from 2005 through 2007 treated at hospitals in downtown Los Angeles.
5. Private hospitals-emergency room (see above explanation of how private hospital costs were estimated)
6. Emergency Medical Transportation
7. Los Angeles County Department of Mental Health
8. Los Angeles County Department of Public Health
9. Los Angeles County Department of Public Social Services Food Stamps
10. Los Angeles County Department of public Social Services General Relief
11. Los Angeles County Department of Public Social Services GR Housing Vouchers
12. Los Angeles Homeless Services Authority services
13. Los Angeles County Probation Department
14. Los Angeles County Sheriff's Department general jail facilities and services
15. Los Angeles County Sheriff's Department medical jail facilities and services
16. Los Angeles County Sheriff's Department mental health jail facilities and services
17. Supportive housing costs of the Skid Row Housing Trust

Twelve types of costs could not be determined:

1. Homeless services not in shown in the Los Angeles Consortium of Care Homeless Management Information System (HMIS) and not directly funded by LAHSA. These missing costs include a significant number of agencies funded by LAHSA, matching costs by all LAHSA service providers, and all nonprofit service providers not funded by LAHSA, including faith-based missions and food pantries.
2. Non-county outpatient clinics such as JWCH Institute or Homeless Health Care Los Angeles
3. Non-county substance abuse facilities
4. Non-county mental health facilities
5. Veteran's Administrations services
6. State incarceration and parole
7. Federal incarceration
8. City of Los Angeles Police Department
9. Courts
10. Business environment impacts

- 11. Los Angeles City Business Improvement Districts
- 12. Costs outside of Los Angeles County

These twelve types of costs were unavailable for both housed and homeless individuals in this study, so the absence of this data did not create any asymmetry in cost comparisons. However, this missing data results in understating the amount of public costs for homeless residents, and where there are cost savings from housing homeless individuals, to understate the amount of those savings.

⁵ An analysis breaking out public costs by agency for homeless adults in Los Angeles County was released in an Economic Roundtable report titled *Where We Sleep: The Costs of Housing and Homelessness in Los Angeles*, (2009). This was followed a year later by the release of the first triage tool in a report titled *Tools for Identifying High-Cost, High-Need Homeless Persons* (2010). This was followed a year later by the release of a second version of the triage tool that used a partitioned model with three different statistical models for three different age groups. The second version of the triage tool was four times more accurate than the first version released in 2010. It was released in a report titled *Crisis Indicator: Triage Tool for Identifying Homeless Adults in Crisis* (2011). All of these reports can be downloaded from the Economic Roundtable web site, www.economicrct.org.

⁶ The first tool was preceded by a beta tool released in 2010. The beta tool used 16 pieces of information without partitioning the individuals being screened into separate subgroups, and produced probabilities both for being in the 10th decile as well as for being in the combined 9th and 10th deciles. It is less precise than tools I and II that are being adopted for use by hospitals. We recommend that tool I or II be used rather than the beta tool because of their greater accuracy.

⁷ The homeless study population is generally representative of Los Angeles County’s population of homeless single adults who are U.S. citizens or legal immigrants. The sample does not include unauthorized immigrants or residents of other counties. In addition, the sample excluded individuals who had worked in the past three years because they were less than half as likely to be in the tenth decile as people who had not worked.

⁸ Supporting data for Figure 1, factors used in triage tool to identify homeless adults in the tenth decile:

Triage Tool II Factors	Percent of Homeless Health Care Encounters where Attribute is Present	Percent of Homeless Persons with Attribute in 10th Decile	Percent of Persons in Homeless 10th Decile with Attribute
Female	29%	17%	21%
Male, Age 18-29	14%	22%	13%
Male, Age 30-45	31%	22%	30%
Male, Age 46+	27%	31%	36%
Emergency Room User in Past 3 Years	86%	25%	95%
Hospital Inpatient in Past 3 Years	27%	51%	61%
Born in State Other than California	29%	27%	33%
Primary Language not English	2%	19%	2%
Born in Country Other than U.S.	7%	18%	5%
African American	13%	26%	57%
Disabled	51%	30%	68%
Substance Abuse	42%	28%	51%
Diagnosed with Chronic Medical Condition	53%	31%	71%
Mental Disorder + Substance Abuse	6%	42%	25%
001-139 Infections & Parasitic	11%	34%	17%
042 HIV Disease	1%	51%	3%
140-239 Neoplasm	3%	31%	5%
240-279 Endocrine & Metabolic & Immune	8%	33%	12%
250 Diabetes	2%	35%	8%
280-289 Blood & Blood Organs	2%	47%	4%
290-319 Mental Health Disorders	25%	36%	40%
291 Alcohol-induced Mental Illness	2%	34%	3%
292 Drug-induced Mental Illness	3%	43%	5%
295 Schizophrenic Disorders	3%	63%	7%
296 Episodic Mood Disorders	9%	42%	16%
298 Other Nonorganic Psychoses	9%	45%	18%

311 Other Depressive Disorders	4%	39%	6%
320-389 Nervous System	15%	31%	20%
390-459 Circulatory System	15%	36%	23%
401-405 Hypertensive Disease	10%	35%	15%
410-414 Ischemic Heart Disease	2%	45%	4%
420-429 Other Heart Disease	3%	40%	5%
451-459 Vein & Lymphatic Disease	2%	45%	5%
460-466 Respiratory Infections	9%	29%	11%
460-519 Respiratory System	18%	30%	23%
470-478 Other Disease Upper Respiratory Tract	3%	32%	4%
480-488 Pneumonia & Influenza	3%	37%	5%
490-496 Chronic Pulmonary Disease	25%	25%	27%
520-579 Digestive System	25%	25%	27%
580-629 Genitourinary System	13%	26%	15%
590-599, 614-616 Urinary Disease	2%	27%	8%
680-709 Skin & Subcutaneous	6%	31%	28%
681-682 Cellulites	14%	31%	19%
710-739 Musculoskeletal System	25%	28%	30%
780-799 Ill-defined Conditions	9%	30%	39%
800-999 Injury & Poisoning	11%	30%	49%
V01-V89 Factors Influencing Health	13%	29%	56%

⁹ The rates of correct classification were obtained using a triage tool cutoff score of 0.35 for probability of being in the 10th decile.

¹⁰ Several of the fields of information in the form for collecting hospital diagnostic and service use data are not used in the triage tool, but are used to identifying patients who have unusual and very serious medical conditions that are likely to place them in the 10th decile:

- Pulmonary Tuberculosis (011)
- Cardiac dysrhythmias (427)
- Other venous embolism and thrombosis (453)
- Chronic liver disease and cirrhosis (571)
- Diseases of pancreas (577)
- Poisoning by central nervous system stimulants (970)

¹¹ Housing First together with a harm reduction approach entail providing housing as quickly as possible regardless of the challenges the homeless individual is experiencing. These challenges may well include addiction and mental illness. A range of services are immediately offered to help the individual achieve stability, remain housed, and enhance their overall well-being. Housing is not contingent upon participation in services. Through a variety of early engagement and community-building activities, coupled with a safe, supportive environment, easy access to services, no predetermined sequence or set of services, and a highly client-driven approach to developing a services plan, staff engages the individual in services designed meet his or her specific needs.

¹² Supporting data for Figure 11, distribution of triage tool IDs for homeless adults treated by hospitals:

	Females		Males 18-29		Males 30-45		Males 46+	
	Not 10th Decile	10th Decile						
Incorrect	5%	3%	9%	6%	8%	5%	9%	9%
Correct	80%	12%	72%	13%	73%	14%	60%	22%

¹³ Supporting data for Figure 12, rate of correct 10th Decile IDs of homeless hospital patients by triage tool II at different cutoff levels:

Cutoff %	Percent Correct IDs				
	Females	Males 18-29	Males 30-45	Males 46+	ALL HOMELESS
0.05	0.69	0.24	0.40	0.22	0.41
0.10	0.80	0.49	0.62	0.42	0.60
0.15	0.86	0.66	0.74	0.58	0.72

0.20	0.88	0.73	0.78	0.68	0.78
0.25	0.90	0.77	0.81	0.69	0.80
0.30	0.91	0.80	0.83	0.72	0.82
0.35	0.91	0.81	0.84	0.75	0.83
0.40	0.91	0.82	0.84	0.76	0.84
0.45	0.92	0.82	0.84	0.76	0.84
0.50	0.91	0.82	0.84	0.75	0.83
0.55	0.91	0.81	0.83	0.75	0.83
0.60	0.92	0.81	0.84	0.75	0.83
0.65	0.91	0.80	0.83	0.75	0.83
0.70	0.91	0.80	0.83	0.75	0.83
0.75	0.90	0.80	0.83	0.75	0.82
0.80	0.90	0.79	0.83	0.74	0.82
0.85	0.88	0.78	0.82	0.73	0.81
0.90	0.88	0.77	0.82	0.72	0.80
0.95	0.88	0.75	0.80	0.70	0.79
1.00	0.83	0.72	0.75	0.61	0.73

¹⁴ Supporting data for Figures 13-16, burden and shortfall from using triage tool II with different probability cutoffs for assigning patients to the 10th decile:

Cutoff Value (Estimated Probability) for 10th Decile	Females		Males 18-29		Males 30-45		Males 46+	
	Shortfall	Burden	Shortfall	Burden	Shortfall	Burden	Shortfall	Burden
0.05	0.1	1.7	0.0	2.7	0.0	2.2	0.01	1.8
0.10	0.1	1.0	0.1	1.9	0.1	1.4	0.0	1.4
0.15	0.2	0.7	0.2	1.2	0.2	1.0	0.1	1.0
0.20	0.2	0.5	0.3	0.9	0.3	0.8	0.1	0.7
0.25	0.3	0.4	0.4	0.7	0.4	0.6	0.3	0.6
0.30	0.3	0.3	0.6	0.5	0.5	0.5	0.4	0.5
0.35	0.4	0.3	0.7	0.4	0.6	0.4	0.4	0.4
0.40	0.4	0.2	0.7	0.4	0.6	0.3	0.5	0.3
0.45	0.5	0.2	0.9	0.3	0.7	0.3	0.6	0.3
0.50	0.5	0.2	1.0	0.3	0.8	0.2	0.8	0.2
0.55	0.6	0.1	1.3	0.2	1.0	0.2	0.9	0.2
0.60	0.6	0.1	1.5	0.2	1.1	0.2	1.0	0.1
0.65	0.7	0.1	1.8	0.2	1.2	0.1	1.1	0.1
0.70	0.7	0.1	2.0	0.1	1.3	0.1	1.2	0.1
0.75	0.8	0.1	2.2	0.1	1.5	0.1	1.3	0.0
0.80	1.0	0.1	2.3	0.1	1.6	0.1	1.4	0.0
0.85	1.4	0.1	3.0	0.1	1.8	0.1	1.6	0.0
0.90	1.5	0.1	3.7	0.1	2.0	0.0	1.8	0.0
0.95	1.6	0.0	6.4	0.1	2.5	0.0	2.2	0.0

¹⁵ The percent of women, and each of the other three groups, correctly classified was determined using STATA, with a probability cutoff of 0.5.

¹⁶ See preceding endnote for burden and shortfall from using triage tool II to estimate the 10th decile status of men 18 to 29 years of age.

¹⁷ See preceding endnote for burden and shortfall from using triage tool II to estimate the 10th decile status of men 30 to 45 years of age.

¹⁸ See preceding endnote for burden and shortfall from using triage tool II to estimate the 10th decile status of men 46 years of age and older.