Hospital to Home

Triage Tool II for Identifying Homeless Hospital Patients in Crisis

Economic Roundtable
Nonprofit Research and Innovation

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Table of Contents

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 connects some of these dots. The predictive powers 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 now being used or introduced 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.

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 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 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.**

Triage tool II 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 work[1] 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.

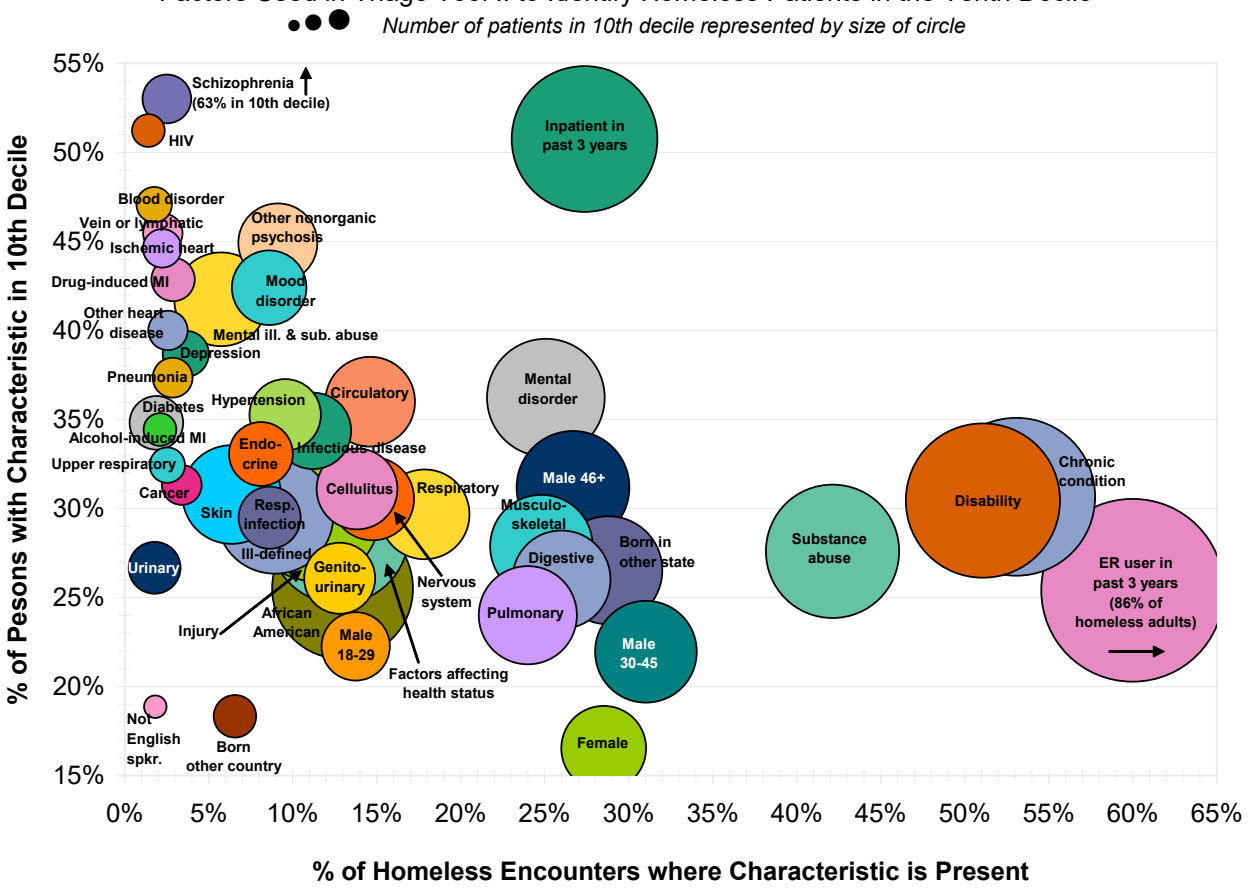
The triage tools are in Excel format and can be downloaded from the Economic Roundtable web site: *www.economicrt.org*.

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

Figure 1
Factors Used in Triage Tool II to Identify Homeless Patients in the Tenth Decile



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

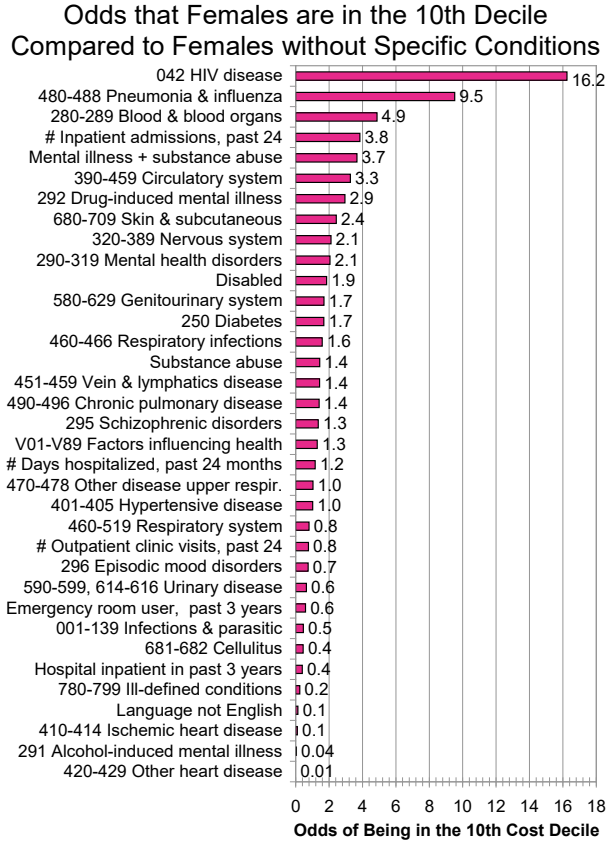
Many separate pieces of information provide evidence about the likelihood that someone will be in the 10th decile, but no single piece of evidence by itself provides enough information to identify this population with adequate certainty. The tool addresses this problem by combining the predictive power 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.

Figure 2



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

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

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.

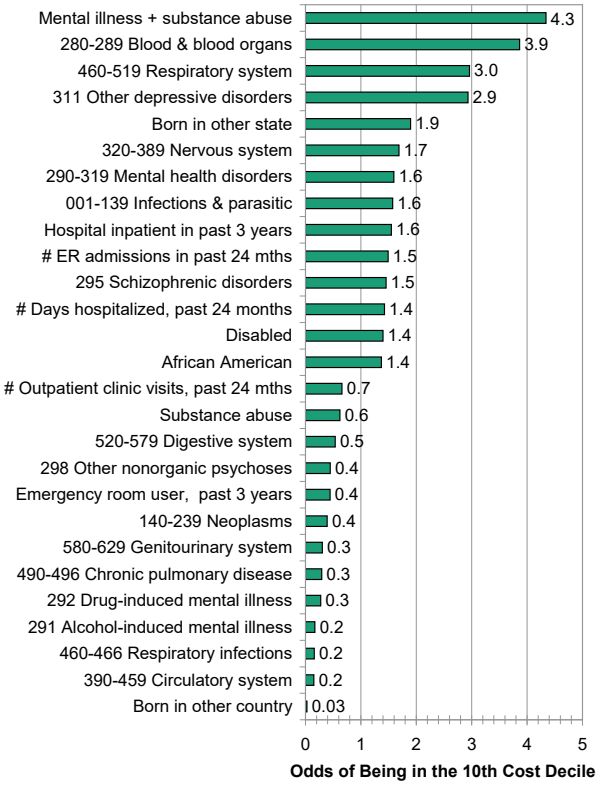
Females

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

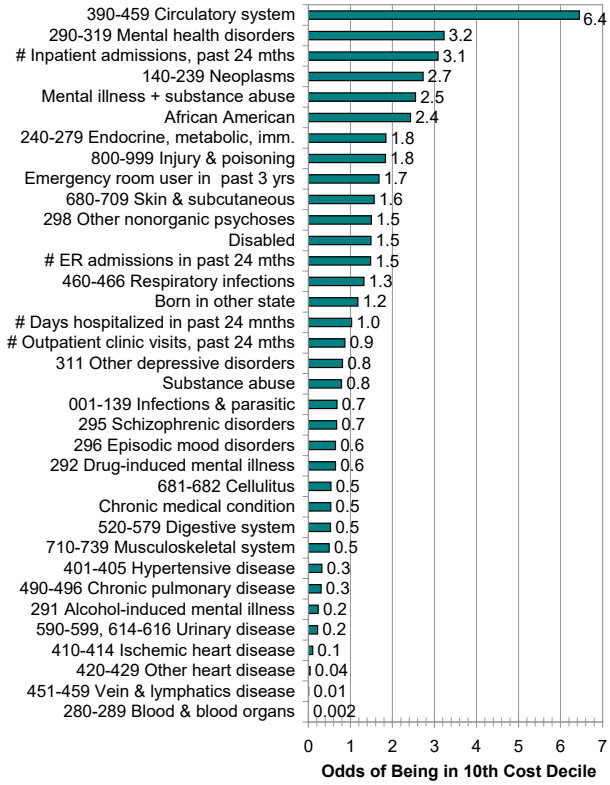
Of the 27 factors used to screen homeless men 18-29 years of age (Figure 3), the most significant is a dual diagnosis of mental illness and substance abuse. The odds of being in the 10th decile are 4.3 higher for men who are dual diagnosed than for men in this age group who are not. Next most significant is diseases of the blood and blood forming organs such as anemia.

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

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 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.

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.

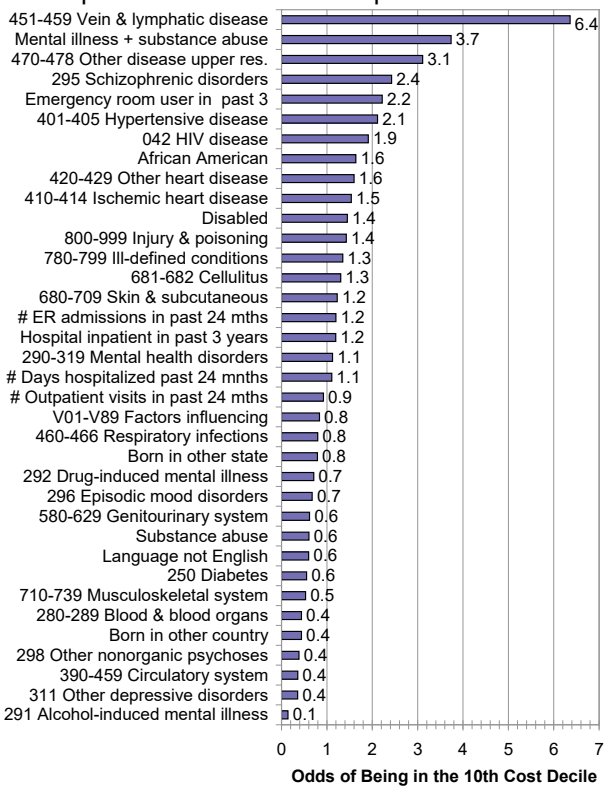
Accuracy of Screening for the Four Groups

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.

Figure 5

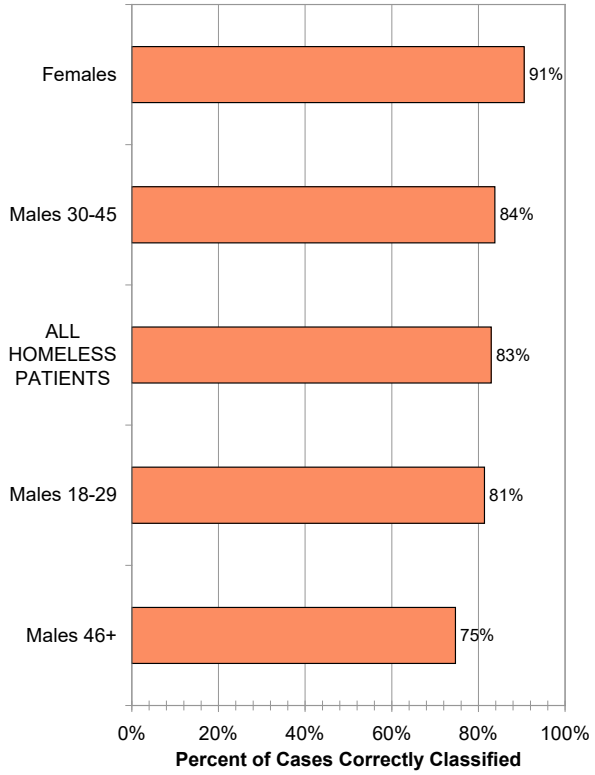
Odds that Males 46+ are in the 10th Decile Compared to Males without Specific Conditions



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

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 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 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-didgit 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 un-abridged 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 7
Triage Tool II User Interface

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
ESTIMATED PROBABILITY FOR 10th DECILE	*0.96*	*0.36*	*0.65*	*0.87*	*0.57*	*0.48*	*0.64*	*0.39*	*0.45*
CHOOSE ONE GROUP PER CASE:									
Female	y	y			y				
Male, Age 18-29				y		y			
Male, Age 30-45							y	y	
Male, Age 46+			y						y
IN PAST 3 YEARS:									
Emergency Room User in Past 3 Yrs				y	y	y	y	y	y
Hospital Inpatient in Past 3 Yrs	y		y	y	y		y	y	
IN PAST 2 YEARS:									
Clinic outpatient, Dr's office (#visits)			3						
Hospital inpatient (#admissions)	2		4	3	1		2	3	3
Emergency Room (#admissions)	4			11	4	8	7	10	9
Hospital inpatient (#days)	6		8	14	10		4	12	10
CURRENT STATUS:									
Born in Other State	y				y	y			
Born in Other Country									
Language not English									
African American			y				y	y	
Disabled	y		y	y	y		y	y	
Substance Abuse	y		y	y		y	y	y	
Chronic Condition (HCUP)	y		y	y	y		y	y	
Mental Disorder + Substance Abuse	y		y				y		
001-139 Infections & Parasitic									
042 HIV Disease		y							
140-239 Neoplasms									
240-279 Endocrine & Metabolic & Immune									y
250 Diabetes									y
280-289 Blood & Blood Organs								y	
290-319 Mental Health Disorders	y	y	y	y	y	y		y	
291 Alcohol-induced Mental Illness				y					
292 Drug-induced Mental Illness				y					
295 Schizophrenic Disorders	y					y			
296 Episodic Mood Disorders			y				y		
298 Other Nonorganic Psychoses	y				y		y		
311 Depressive Disorders								y	
320-389 Nervous System				y			y		
390-459 Circulatory System	y				y			y	y
401-405 Hypertensive Disease								y	y
410-414 Ischemic Heart Disease									
420-429 Other Heart Disease									
451-459 Vein & lymphatic Disease					y				
460-519 Respiratory System			y						y
460-466 Respiratory Infections			y						
470-478 Other Disease-Upper Respiratory Tract			y						
480-488 Pneumonia & Influenza									
490-496 Chronic Pulmonary Disease									y
520-579 Digestive System				y		y			
580-629 Genitourinary System				y			y		
590-599, 614-616 Urinary Disease							y		
680-709 Skin & Subcutaneous									
681-682 Cellulitus									
710-739 Musculoskeletal System							y		
780-799 Ill-defined Conditions									
800-999 Injury & Poisoning				y					
V01-V89 Factors Influencing Health									

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 individuals 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.

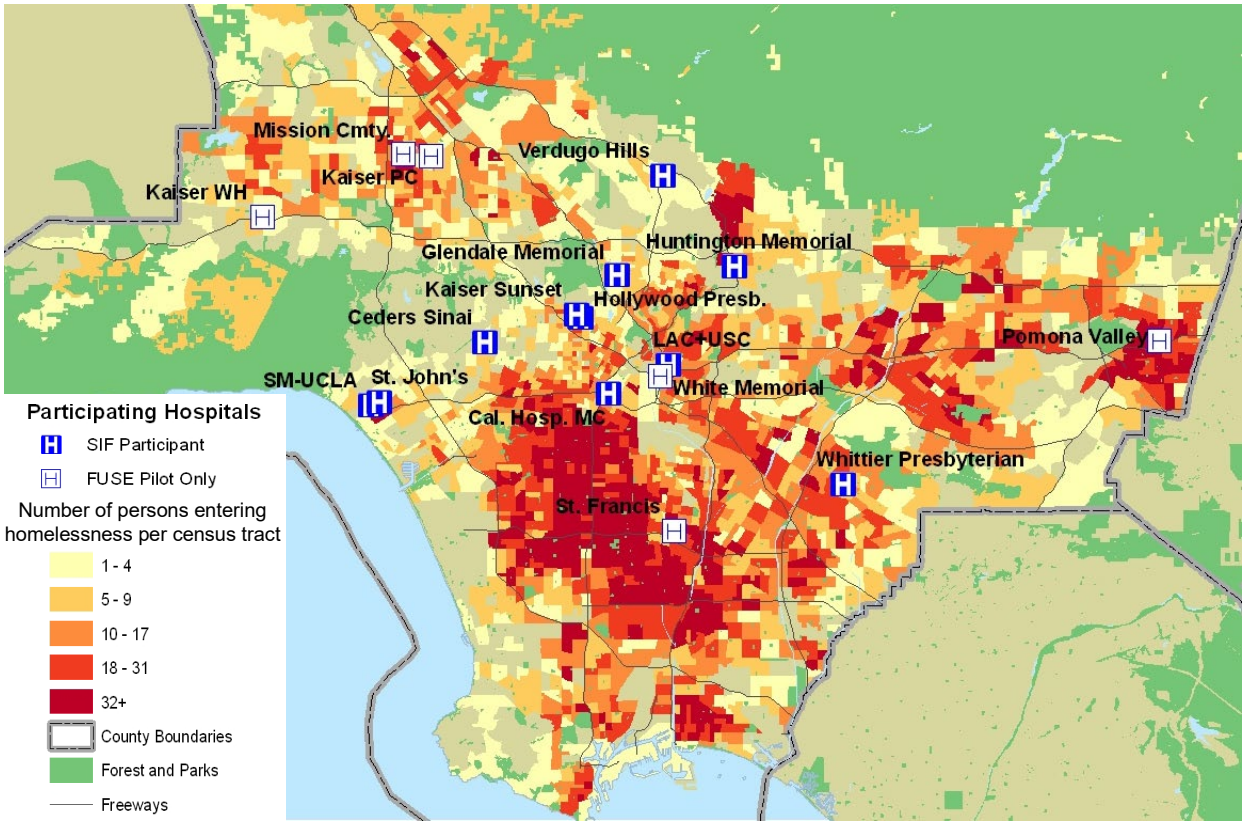
The tool draws on information from the entire study population (n=2.907) seen in hospitals to capture joint influences of all of the variables shown in Figure 7. Because the tool has been developed through statistical analysis of the strength of association among all of these variables, it can produce 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)

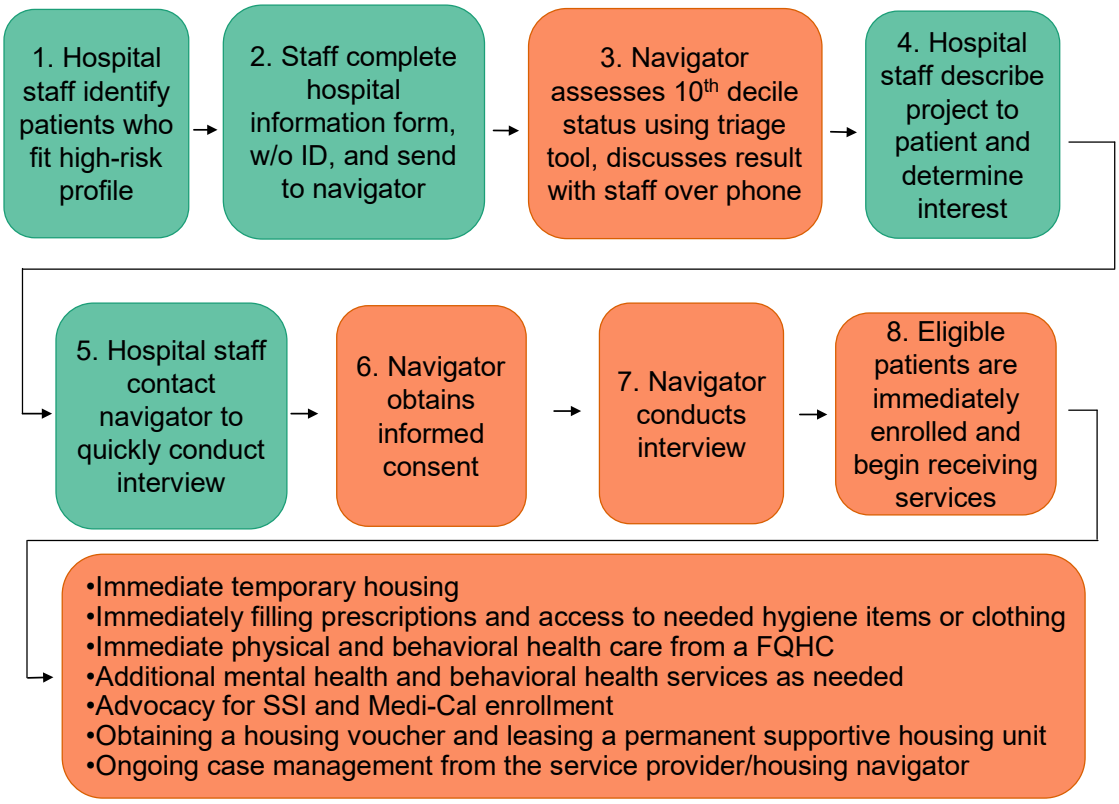
Medical staff identifies patients who fit the profile of individuals in the 10th decile. Often this is done by hospital social workers. The key elements of the profile are that patients are homeless and have above-average use of hospital services. For example, aside from any other health factors and 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)

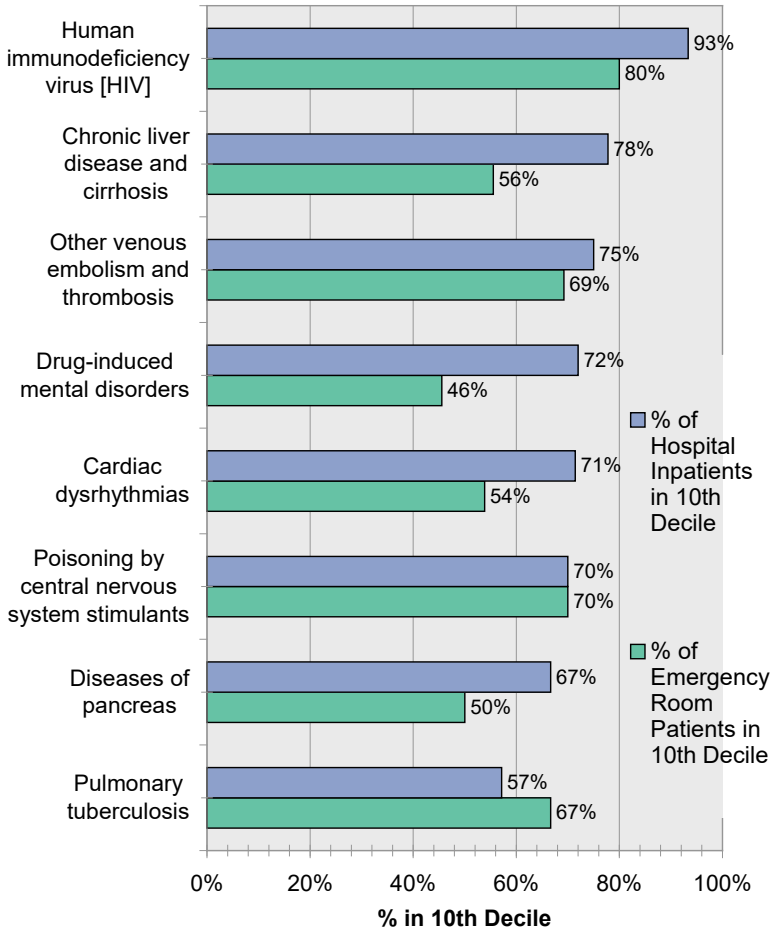
The completed hospital information form is sent to the housing navigator/service provider who works closely with 10th decile patients and assists them in obtaining benefits, ongoing outpatient health and behavioral health care, and housing. Depending on hospital policies and the relationship between 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.

Figure 10
Diagnoses Likely to Result in 10th Decile Public Costs



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

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)

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.

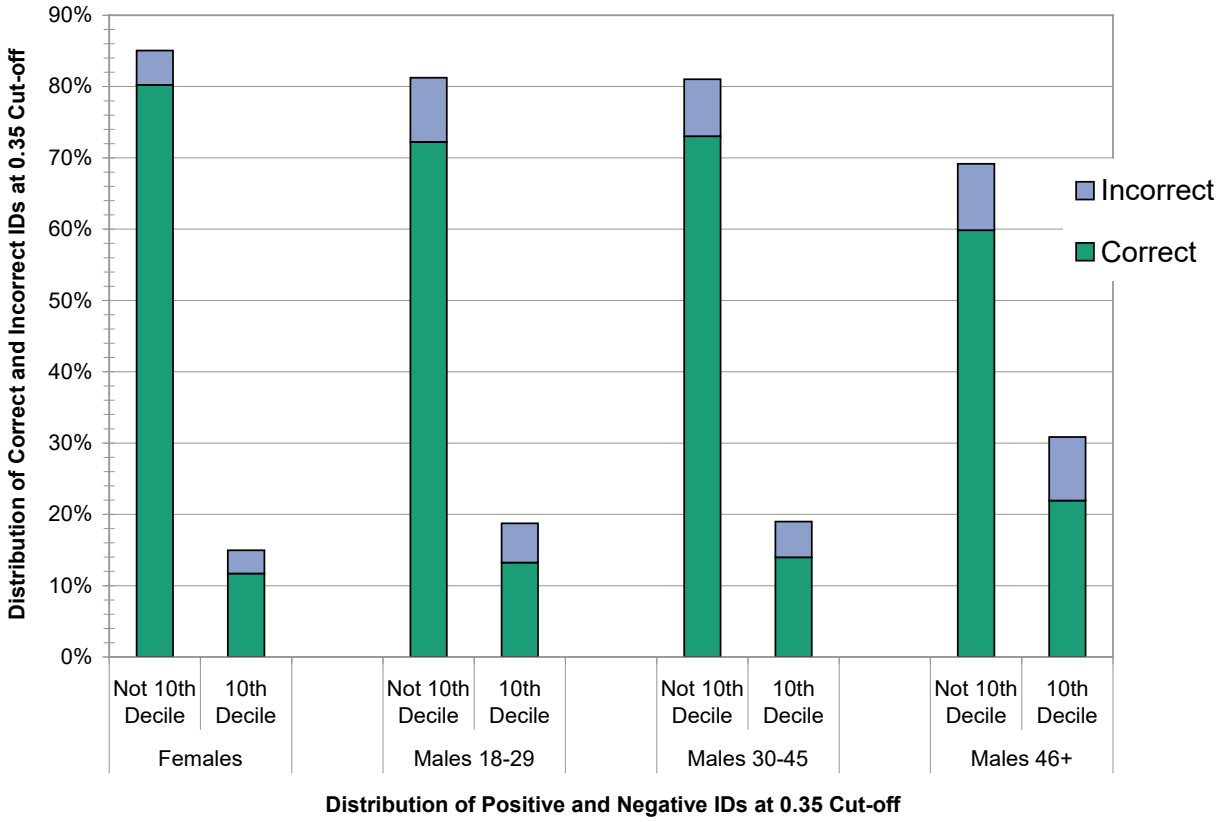
Statistical Appendix

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.

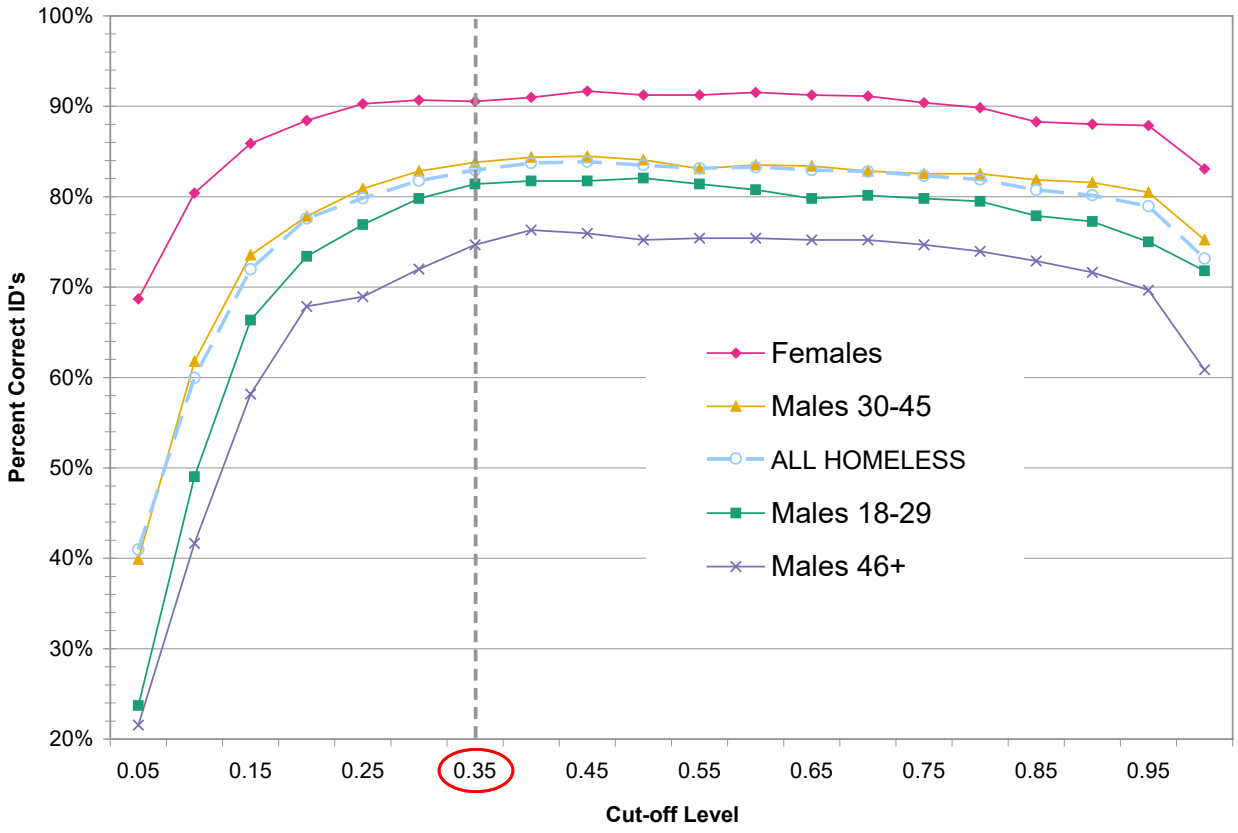
The distribution of determinations about the 10th decile status of patients in each gender/age group, broken out by correct and incorrect IDs at the 0.35 cutoff level, is shown in Figure 11.[12] Most of the estimates are negative and most are correct.

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

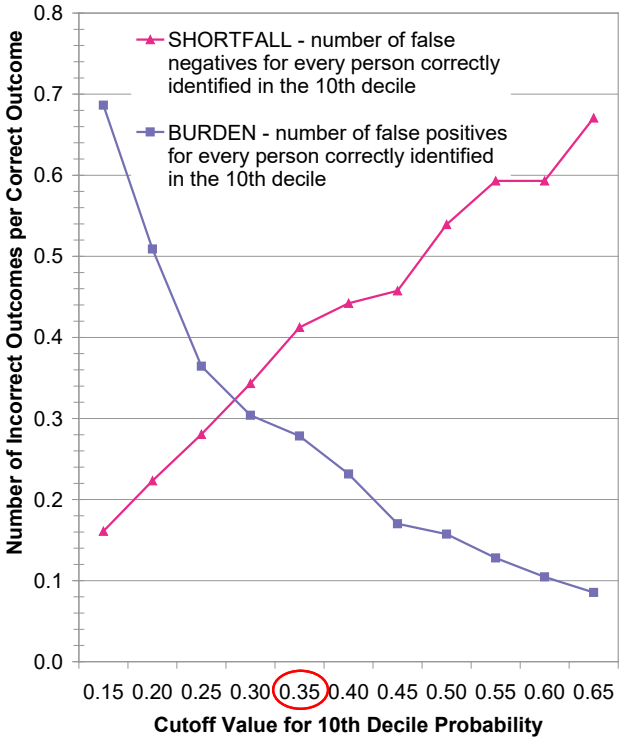


Source: Derived from logistic regressions of records for 2,907 homeless General Relief recipients over 18 years of age with no employment in the past 3 years who were treated at a hospital of Los Angeles County Department of Health Services.

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.

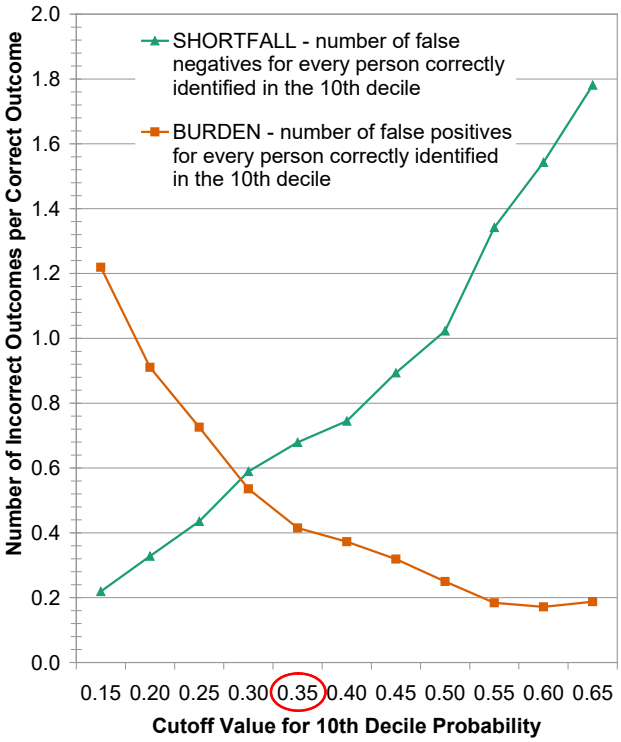
Triage tool II uses four separate statistical models for four different groups of homeless adults: females; males, 18 to 29, males, 30 to 45, and males, 46 and older. For three of the four groups, all but older males, a cutoff value of 0.35 produces slightly conservative trade-offs, with the rate of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

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.

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



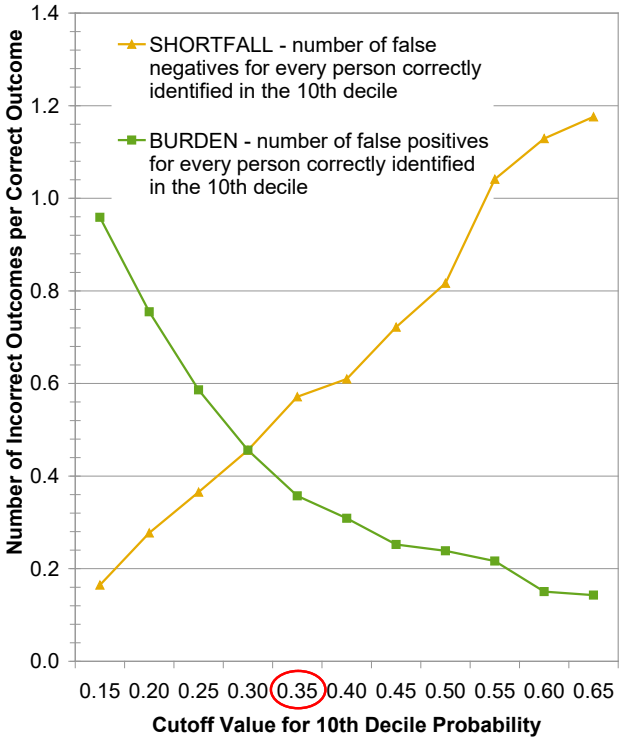
Source: Derived from logistic regressions of records for 2,907 homeless General Relief recipients over 18 years of age with no employment in the past 3 years who were treated at a hospital of Los Angeles County Department of Health Services.

The 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

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

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

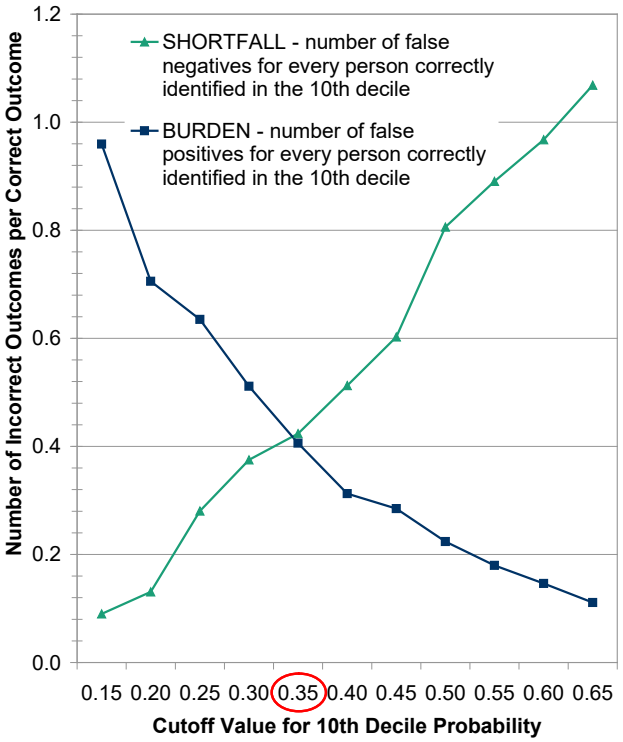


Source: Derived from logistic regressions of records for 2,907 homeless General Relief recipients over 18 years of age with no employment in the past 3 years who were treated at a hospital of Los Angeles County Department of Health Services.

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



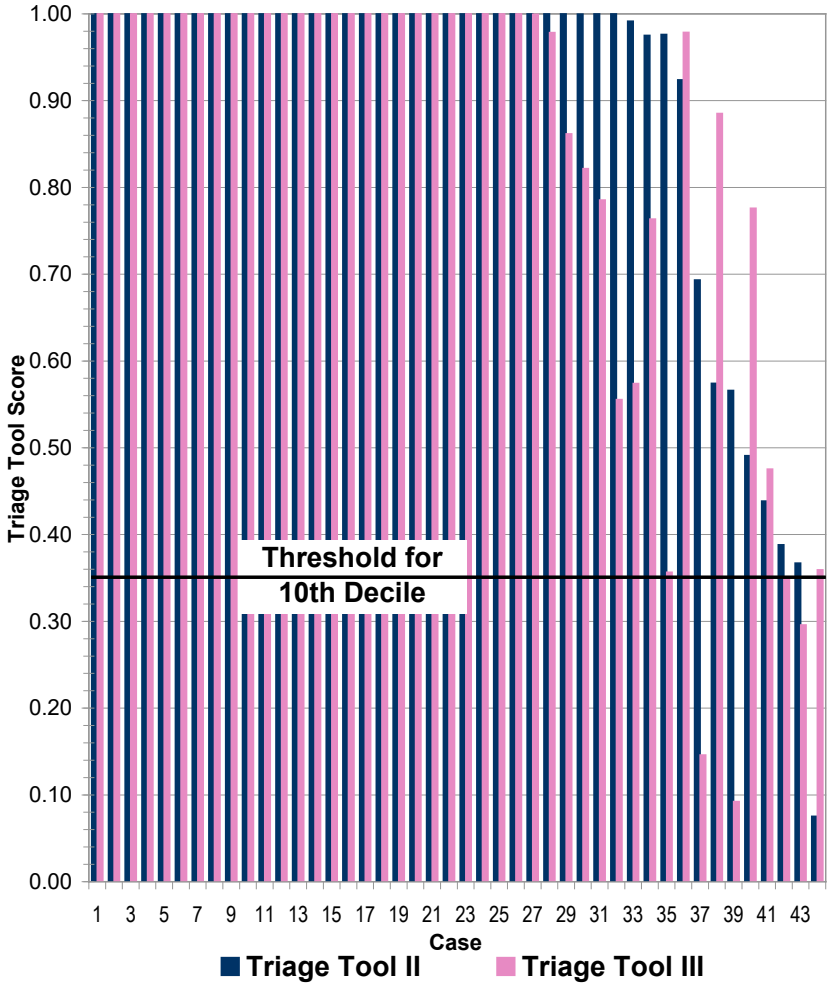
Source: Derived from logistic regressions of records for 2,907 homeless General Relief recipients over 18 years of age with no employment in the past 3 years who were treated at a hospital of Los Angeles County Department of Health Services.

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 hospitals are shown in Figure 11.

Figure 11
10th Decile Probabilities Produced by Triage Tools II and III



Source: 44 hospital patients screened by the Economic Roundtable.

- 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.
- *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 un-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.

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.

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	

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=.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[case is in 10th decile] = e^z/(1+e^z), where z = B+SUM[BiXi],

where B is constant and Bi 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 Cellulitus	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	

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	

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 Cellulitus	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	
# DaysHospitalized, 24 Mnths	1.028	0.028	-0.174	0.230	0.785	0.000
DaysHospitalized, squared	1.011	0.011	0.003	0.019	0.005	
Constant		-3.870	-4.835	-2.904	0.000	

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 Cellulitus	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	

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 <u>ineligible</u> 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?** ❑ **yes** ❑ **no**
2. **On parole for a violent crime?** ❑ **yes** ❑ **no**
3. **Convicted of arson?** ❑ **yes** ❑ **no**
4. **Convicted of operating a methamphetamine lab?** ❑ **yes** ❑ **no**
5. **Committed an offense that requires registering as a sex offender?** ❑ **yes** ❑ **no**
6. **Needs continuing nursing care?** ❑ **yes** ❑ **no**

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

II. General Information

Gender?
- ❑ **Male**
- ❑ **Female**

Language?
- ❑ **English**
- ❑ **Spanish**
- ❑ **Other _____**

Veteran?
- ❑ **Yes**
- ❑ **No**
- ❑ **Don't Know**

Ethnicity?
- ❑ **African American**
- ❑ **Asian**
- ❑ **Caucasian**
- ❑ **Latino**
- ❑ **Pacific Islander**
- ❑ **Other _____**

Alcohol or drug dependency?
- ❑ **Yes**
- ❑ **No**
- ❑ **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]*.

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

☑	Group	Sub-Group	ICD-9-CM Code and Name of Principal Diagnosis	Version of Triage Tool		Chronic
❑			**Chronic Rheumatic Heart Disease (393-398)**			
❑			**Hypertensive Disease (401-405)**	1	2	
			401 Essential hypertension			c
			403 Hypertensive chronic kidney disease			c
❑			**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
			Diseases of Pulmonary Circulation (415-417)			
❑			**Other Forms of Heart Disease (420-429)**		2	
❑			**427 Cardiac dysrhythmias**	*	*	c
			428 Heart failure			c
			Cerebrovascular Disease (430-438)			c
			Diseases of Arteries, Arterioles, & Capillaries (440-449)			c
❑			**Diseases of Veins & Lymphatics, & Other Diseases of Circulatory System (451-459)**		2	
❑			**453 Other venous embolism and thrombosis**	*	*	
❑	**8. DISEASES OF THE RESPIRATORY SYSTEM (460-519)**			1	2	
❑			**Acute Respiratory Infections (460-466)**		2	
			462 Acute pharyngitis			
			465 Acute upper respiratory infections of multiple or unspecified sites			
			466 Acute bronchitis and bronchiolitis			
❑			**Other Diseases of the Upper Respiratory Tract (470-478***)*		2	
			473 Chronic sinusitis			c
❑			**Pneumonia & Influenza (480-488)**		2	
			486 Pneumonia, organism unspecified			
❑			**Chronic Obstructive Pulmonary Disease & Allied Conditions (490-496)**		2	
			490 Bronchitis, not specified as acute or chronic			
			491 Chronic bronchitis			c
❑			**493 Asthma**	1		c
			Other Diseases of Respiratory System (510-519)			
			511 Pleurisy			
❑	**9. DISEASES OF THE DIGESTIVE SYSTEM (520-579)**			1	2	
			Diseases of Oral Cavity, Salivary Glands, & Jaws (520-529)			
			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			
			Diseases of Esophagus, Stomach, & Duodenum (530-538)			
			530 Diseases of esophagus			
			535 Gastritis and duodenitis			
			536 Disorders of function of stomach			
			Hernia of Abdominal Cavity (550-553)			
			550 Inguinal hernia			
			553 Other hernia of abdominal cavity without mention of obstruction or gangrene			
			Noninfectious Enteritis & Colitis (555-558)			
			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
			Other Diseases of Digestive System (570-579)			
❑			**571 Chronic liver disease and cirrhosis**	*	*	c
			574 Cholelithiasis			
❑			**577 Diseases of pancreas**	*	*	
			578 Gastrointestinal hemorrhage			
❑	***10.***		***DISEASES OF THE GENITOURINARY SYSTEM (580-629)***		2	
❑			**Other Diseases of Urinary System (590-599)**	1	2	
			590 Infections of kidney			
			592 Calculus of kidney and ureter			
			597 Urethritis, not sexually transmitted, and urethral syndrome			
			599 Other disorders of urethra and urinary tract			
❑			**Inflammatory Disease of Female Pelvic Organs (614-616)**		2	
			614 Inflammatory disease of ovary, fallopian tube, pelvic cellular tissue, and peritoneum			
			616 Inflammatory disease of cervix, vagina, and vulva			
❑	**12.**		**DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE (680-709)**		2	
❑			**681-682 Cellulitis**		2	
			683 Acute lymphadenitis			
			686 Other local infections of skin and subcutaneous tissue			
❑	**13.**		**DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE (710-739)**	1	2	
			Arthropathies & Related Disorders (710-719)			c
			715 Osteoarthrosis and allied disorders			c
			716 Other and unspecified arthropathies			c
			717 Internal derangement of knee			c
			Dorsopathies (720-724)			
			721 Spondylosis and allied disorders			c
			723 Other disorders of cervical region			
			724 Other and unspecified disorders of back			
			Rheumatism, Excluding the Back (725-729)			
			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			
			Osteopathies, Chondropathies, & Acquird Musculoskel. Deformities (730-739)			
			730 Osteomyelitis, periostitis, and other infections involving bone			c
			733 Other disorders of bone and cartilage			
❑	**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			
❑	**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			

☑	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		
❑			**970 Poisoning by central nervous system stimulants**		
❑	**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 <u>two-years</u> 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 known as 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.economicrt.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	Not 10th Decile	10th Decile	Not 10th Decile	10th Decile	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:

	Percent Correct IDs				
Cutoff %	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.