Return on Investment Analysis and Modeling

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**EXECUTIVE SUMMARY**

Through Congress’s ongoing support, the Department of Veterans Affairs (VA) has made a substantial commitment to Ending Veteran Homelessness. Congress’s support of VA’s Plan to End Veteran Homelessness has directly resulted in an increase of permanent supportive housing stock and the programmatic support for the services necessary to identify, treat and prevent homelessness. All of this facilitates both the rapid placement in housing and the delivery of the care to homeless Veterans needed to maintain permanent housing. It is very valid to question whether the use of these funds has been both effective and cost effective in meeting this objective.

In this paper, we present a Return on Investment (ROI) analysis of Veterans Health Administration (VHA) Homeless Programs Office obligated funding since 2010, using three different cost- and impact- modeling assumptions. The ROI analysis purposefully employed more conservative, short-term (one year) impact effects that were not accrued over time. The net cost of homelessness assumptions were based on an extensive review of the published literature on costs of homelessness and cost savings associated with housing placement and provision of services to both veteran and non-Veteran homeless. These cost estimates considered costs associated with direct services to homeless persons across the spectrum of health care, criminal justice, social support and service needs. They were considered from a community and cross-agency perspective as opposed to being based only in one system (i.e., VHA) or cost-center. Not included in the cost estimates were indirect or societal costs (e.g., quality of life in a community, impact on local economies, lost wages and productivity).

Population estimates of homelessness were derived from the Department of Housing and Urban Development’s (HUD) annual Point-in-Time (PIT) Count of homeless Veterans. A “net impact effect” of the Ending Veteran Homelessness (EVH) initiative was derived by subtracting the actual PIT Count of Veteran homelessness each year from a calculated estimate of Veteran homelessness. This calculated estimate was based on rate changes to the overall homeless population PIT recorded for that year that were then applied to homeless Veterans using the 2009 PIT Veteran count as baseline. The “investment” costs reflect the global budget of obligated funds aggregated between fiscal year (FY) 2010 through FY 2013 for the VHA Homeless Programs Office that support over 20 different programs that provide both housing supports and services to homeless Veterans.

Findings from this analysis demonstrated a positive return on investment from the Federal EVH initiative. The return rate ranged from 1.0 percent to 89.4 percent, depending on the set of cost-offset and population-impact assumptions used in the ROI modelling. The “true” return rate likely lies somewhere in the middle of this range, influenced by the proportion of chronically homeless, high-complexity, high-cost Veterans who are being placed in housing, a goal of Housing First.
Additionally, the “true” return rate is further influenced by the geographic region where the homelessness occurred, with high-volume/high-cost communities such as Los Angeles and New York City likely to generate both higher costs and greater cost offsets. Within the limits of this modeling, this analysis provides evidence that Congress’ support of the initiative to Ending Veteran Homelessness has been both good policy and has made good fiscal sense.

BACKGROUND

Ending Veteran Homelessness has been a priority of this Administration and VA that has resulted in an unprecedented commitment of resources, planning, and commitment directed towards this goal. This initiative was announced in 2009 and incorporates six core elements: outreach and education, treatment, enhancing income/employment/benefits, community partnerships, prevention, and providing housing and supportive services. Over $2.6 billion has been committed to this initiative to date, resulting in a substantial increase in the housing stock available to homeless Veterans. It has also resulted in substantial investments in the array of services and supports aimed at identifying, interceding, and rapidly engaging these Veterans in housing, clinical care and social services, as well as a resources aimed at preventing homelessness from occurring. Since its inception, there has been a significant reduction in Veteran homelessness and in 2013 alone, over 60,000 Veterans and their families were either placed in permanent housing or prevented from becoming homeless.

The purpose of this white paper is to present findings from a Return on Investment analysis of the Office of Homeless Program Ending Veteran Homelessness initiative. The intent is to determine if the resources committed to this effort also reflect a prudent and fiscally responsible allocation of Federal funds towards this goal. Details on the rationale for model selection, assumptions made within the model, baseline data used and sources within VHA and peer-reviewed literature for these data and analyses are included below. This is followed by a calculation of the ROI using three different cost savings and impact assumptions and a discussion of both limitations to this approach and implications of these results.

RETURN ON INVESTMENT ANALYSIS

Model Selection

There are several different methods and approaches for calculating a ROI that are used by the business community. We purposefully chose to employ a more conservative approach that would bias our findings towards a lower or net negative return given the many assumptions used within the modeling. In this white paper, we used the Simple ROI method (1):

\[
\text{(Gain from investment) - (Cost of Investment)} \\
\text{(Cost of investment)}
\]

with “gain from investment” (cost savings associated with leaving homelessness) including only net cost savings for the year immediately following housing placement and not the accrued benefit over subsequent years. Cost of investment was the obligated budget of the VHA Homeless Programs Office for FY 2010, 2011, 2012 and 2013; it did not include support provided to facilities through the Veterans Equitable Resource Allocation process as this would incorporate investment costs that extend beyond the EVH initiative.
We also considered but did not use alternative models including Net Present Value, which incorporates interest rate assumptions and potential alternative uses of funds which may not necessarily be applicable in this setting. A Logarithmic Return model, which compounds the return and considers exponential growth of the value of investment, may have been applicable to this scenario given the ongoing benefit an individual would achieve from not being homeless. However, we ultimately chose not to use it in our analyses both given the relative paucity of longitudinal data in the literature that accurately reports on this outcome and our efforts to err on the side of conservative modeling. Finally, we also considered a Social ROI model, which is often used by nonprofits and governments. This model would have included long-term effects on the community and environment which may have been very relevant to this intervention. However, here also because of the relatively weaker cost and cost-savings data in these domain areas and our interest in not overstating economic benefit, we chose to not use this model.

COST OF HOMELESSNESS AND COST SAVINGS ESTIMATES

Costs of homelessness

There has been an increased focus on costs of homelessness and cost savings associated with interventions aimed at this population. Consideration of the costs of homelessness builds on a framework outlined by Culhane, et al. in 1998 (2) and later updated by this team in 2007 (3) for considering global costs from a community and interagency perspective. This includes costs experienced across health care, criminal justice, social service agencies, emergency and first responders, and the business community. Within this framework, there have been several studies describing cost-savings and cost offsets associated with placing homeless persons in housing. One of the more rigorous analyses cited in the literature and applied to different communities is a study of New York City homeless that estimated annualized costs to be $40,000 (1999 dollars) (4), which in 2013 would be $55,959. This is similar to another study, based on alcohol abusing chronic homeless in Seattle that reported annualized costs averaging over $58,000 in 2013 dollars (7). Other studies cited below reported a wider range of annualized costs, including several studies with costs substantially higher. The wide range of reported costs associated with homelessness likely reflect several factors: there are substantial differences in health care and incarceration costs depending on the region of the country; there are also different needs and care-use patterns among homeless subpopulations based on complexity, co-morbidity, age, etc.; finally, the methods used for capturing costs vary and even within the inclusive framework cited above, the ability to capture costs across multiple systems is challenging (3).

In part, the observed excessive costs of homelessness stems from the fact that homeless persons are sicker and caring for them costs more than it does for nonhomeless persons. In a study of hospitalization use in New York City, homeless persons stayed 4.1 days, or 36 percent longer, in the hospital with substantially higher costs associated with each admission (5). A recent review of homeless Veterans enrolled in the Homeless – Patient Aligned Care Team (H-PACT) program found that their disease severity index scores, a measure of their medical and psychiatric acuity, was almost double that of the general population of Veterans being served, despite being over 10 years younger. It is also important to note that high costs of homelessness are not evenly distributed across the population but instead concentrated among a much smaller group of chronically homeless typically with a serious mental illness, active substance abuse and co-occurring physical health conditions. Consistent with this premise, a study of Philadelphia homeless found that 20 percent of homeless in that city incurred 60 percent of the total service costs, approximately $12 million per year (6).
Cost-offsets from housing the homeless

Several studies have attempted to capture cost-savings and cost-offsets from housing homeless persons. A summary of studies in Culhane et al. (2007) reported annualized cost savings of housing the homeless from deferred health care costs, incarcerations, and emergency services ranging from $10,334 per year in Durham, North Carolina to $112,967 per patient per year in Hennepin County, Minnesota and $133,333 per year in San Diego, California (3). A quasi-experimental study of housing first programming in Seattle, Washington identified pre-housing costs to be $4,066 per person per month (annualized costs of $48,792; $58,228 in 2013 dollars) with a 53 percent reduction in costs compared with the control group (7), similar to the 50 percent reductions noted in another study (8). In a sample of medically ill homeless persons admitted to a Housing First program in San Francisco, the researchers observed a $62,504 reduction in costs in the year following housing placement (9), a 41 percent reduction compared with a matched control group. Similarly, data from VA’s HUD – VA Supportive Housing (HUD-VASH) Housing First Pilot on placements demonstrated a 66 percent reduction in VHA urgent care visits (10), a percentage that would likely be higher if also considering non-VA care, costs of incarceration and other expenses noted earlier. The potential public health benefit from housing is even more striking. Placing Human Immunodeficiency Virus (HIV)-positive homeless persons into stable housing has been shown to reduce higher risk behavior; averting one case of HIV transmission would save $221,365 in treatment costs (11). Similarly, a multi-city initiative sponsored by the Corporation for Supportive Housing showed a 45 percent reduction in jail bookings and a 39 percent to 76 percent reduction in jail days with associated cost savings of over $4 million in one city (12).

Veteran-specific cost considerations

Costs are concentrated in a high-risk Veteran cohort: In a recent analysis of high-cost homeless Veterans in Baltimore, Maryland conducted by the National Center on Homelessness among Veterans, 239 Veterans accrued VHA health care costs over the previous year exceeding $100,000; 44 Veterans in that group had health expenditures of over $250,000 while two had costs in excess of $1.4 million. Only eight in this cohort were in HUD-VASH housing. (Source: National Center on Homelessness among Veterans)
Cost of Veterans exceeds that of non-Veterans: Several epidemiologic studies have shown that Veterans are at higher risk for becoming homeless than non-Veterans (13,14,15,16). They also tend to be older than non-Veteran homeless (13), to have higher rates of multiple medical and mental health conditions, be less likely to access ambulatory care settings for care (14), and have more difficulty complying with medical treatments (15). These data all suggest that the cost estimates and potential cost savings described above for homeless non-Veterans are likely to be greater for homeless Veterans who are older, sicker, and more expensive to care for within our systems.

Cost offset (gain from investment) estimates used in model

Based on these data and considerations of costs specific to the Veteran homeless population, we used three different cost-offset figures in our ROI modeling: the most conservative cost offset or net cost savings from housing a homeless Veteran was $40,000, mid-range estimate was $45,000, while the most liberal estimate was $50,000. Net cost savings were only considered for the 12 month capture period immediately following housing placement using both case-control and pre-post estimates to identify cost-savings ranges. It is important to note that these are estimates extrapolated from the current body of published literature that itself has limitations as noted above.

Modeling used to estimate population benefit

The PIT Count reflects an incident count of the number of self-identified homeless Veterans who were unsheltered, residing in an emergency shelter or enrolled in a time-limited transitional housing program during a single night in January.

Our model uses the January 2009 PIT Count as the baseline number of homeless Veterans and then estimates subsequent hypothetical homeless Veteran PIT counts for 2010, 2011, 2012 and 2013 by applying the net change in overall homelessness to the baseline Veteran count. The actual versus projected PIT counts are then used to calculate respective Veteran-Year effect sizes that are multiplied by a prevalence factor and “cost savings from homeless exits” to estimate the cost differential associated with Veteran homelessness for that year. This is intended to estimate the net effect of the Office of Homeless Program/EVH Initiative compared to a projected rate that reflects of the overall change in homelessness during that time.

Based on this approach, if there was no EVH initiative, there would be a net increase in the PIT Count from 75,609 homeless Veterans in 2009 to 76,441 in January 2010, followed by a decrease to 74,836 in 2011, 74,537 in 2012 and 71,779 in January 2013. Instead, with the current investments in the EVH initiative, following the PIT Count of 75,609 in 2009, the actual PIT for 2010 increased slightly less to 76,329, followed by more marked declines to 67,495 in 2011, 62,619 in 2012 and 57,849 in January 2013. The current investments have led to an overall decline of 23.5 percent from the base PIT Count in 2009 and a 24 percent decline since the 2010 PIT Count.

Prevalence factor

Because the PIT Count reflects an incident rate that does not accurately reflect the influx and efflux of homeless persons over the course of 12 months, a prevalence factor was applied to the PIT each year to provide an estimate of the overall number of Veterans who were homeless during the course of that year. Here we also used a range of prevalence factors to reflect a conservative to
more liberal estimate of the overall number of homeless Veterans served and leaving homelessness in any given year. Data sources used to derive these factors include HUD’s Annual Homelessness Assessment Reports (AHAR) for 2010, 2011, 2012 and 2013 that include HUD’s Homeless Management Information System prevalence estimates as well as VHA Homeless Programs Office data on the total number of Veterans served and placed in permanent supportive housing during that fiscal year. The most conservative prevalence factors rate used was 2.0 turnover rate, which results in a prevalence number substantially less than the AHAR-reported 150,000 Veterans; the mid-range factor used was 2.5, while the most liberal factor was 3.0, which results in numbers much higher than the AHAR prevalence data.

**Investment Cost**

Program costs for both models are defined as obligated funds for the VHA Homeless Programs Office for FY 2010 - 2013. We included all programmatic costs assigned to this Office on purpose in order to reflect the global costs of the initiative and the fact that most Veterans are engaged in more than one program in the process of receiving services and exiting homelessness. Dollar amounts during these capture years are: FY 2010 $385,524,000, FY 2011: $543,241,000, FY 2012 $716,325,000, and FY 2013 $992,068,000. The overall Cost of Investment used in our model is the sum of these 4 budget years, $2,637,158,000.
Additional Assumptions/Limitations

There are several other assumptions and limitations to acknowledge in the modeling analyses. The most notable limitation as noted above is that we rely on cost and cost-savings estimates from the literature as opposed to actual cost data collected on a homeless Veteran population. As this data become available and can be considered within a regional economic and subpopulation context, more accurate return on investment analyses will be possible. We did purposefully choose more conservative assumptions to the models, that in total, likely bias our results towards underestimating the true return on investment.

Estimated global costs of homelessness: We purposefully chose to rely on previously vetted estimates identified in the published literature as the basis for our “cost of homelessness” estimates. None of the global measure incorporates opportunity costs associated with lost wages and productivity, as well as extended family and community costs associated with street homelessness which can be much more difficult to measure. Further, as noted earlier, homeless Veterans are older, have more medical, mental health and substance abuse co-morbidities and have more difficulty adhering to treatment, all of which is likely to drive their costs higher than non-Veteran homeless.

Projected growth/decline of homelessness: It is conceivable that the incidence and prevalence of Veteran homeless absent VHA Homeless Programs Office interventions would have been much higher when taking into account the full effect of the recession and regional unemployment rates. Previous research has shown the disproportionately effect this has on imminently homeless or homeless Veterans who tend to be poorer, older and more infirmed. The influx of new at-risk-for-homelessness Veterans returning from the Iraq and Afghanistan theaters may also influence these assumptions.

Acuity level of those homeless Veterans leaving homelessness: Both the New York City and Seattle cost estimates are based on high acuity/high need homeless persons with underlying substance use and serious mental illness conditions. Give the nonparametric distribution of acuity, need and use among homeless persons, it is possible (probable) that these samples over-represent high-cost homeless in their samples. However, the proportion of chronically homeless (who have higher unit costs) placed in VA HUD-VASH units steadily increased from 52 percent to over 70 percent during this time and H-PACT data described earlier reflected acuity rates nearly doubled that of the general population.

Applicability of cost-saving findings to Veterans and VHA: While most of the research to date has focused on non-Veteran homeless, there is an emerging literature base that strongly suggests similar if not greater cost savings would also be appreciated within the VA system and by Veterans leaving homelessness. H-PACT data identified reductions in emergency department and hospitalization use of 28-31 percent and 21-24 percent respectively within the first 6 months of enrollment in the program, along with accelerated housing placement rates (National Center on Homelessness among Veterans; VHA Homeless Programs Office data). Analyses of health-related costs savings of homeless Veterans placed in HUD-VASH units also showed substantial cost savings specific to VA-based care that are comparable to that noted in non-Veteran studies (10).

Population capture within models: It is also important to note that our modeling does not incorporate lesser degrees of cost savings attributed to lower acuity-need Veterans while it does include the global costs of administering programs to them. Over 260,000 Veterans
were served by Office of Homeless Program initiatives in FY 2013, providing prevention, supportive services and housing assistance to numbers of Veterans far in excess of those used in this modeling. We do not have good global estimates of the costs of homelessness or projected cost-savings associated with these other subgroups of homeless Veterans. Had we included a cost estimate for this larger group, the estimated ROI would have likely been substantially larger, further validating our contention that these analyses reflect conservative ROI estimates.

Gain from investment = Decrease in costs associated with leaving homelessness: Net reduction in Veteran homelessness (Total of all 2010-2013 Projected PIT (76,441 + 74,836 + 74,537 + 71,779) – Total of all 2010-2013 Actual PIT (76,329 + 67,495 + 62,619 + 57,849) x prevalence factor x estimated cost savings of leaving homelessness/Veteran)

<table>
<thead>
<tr>
<th>Model</th>
<th>Aggregated Difference in Homeless Counts 2010-2013*</th>
<th>Prevalence factors</th>
<th>Cost savings/Veteran</th>
<th>Total Gain on Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-33,301</td>
<td>3.0</td>
<td>$50,000</td>
<td>$4,995,150,000</td>
</tr>
<tr>
<td>2</td>
<td>-33,301</td>
<td>2.5</td>
<td>$45,000</td>
<td>$3,746,362,000</td>
</tr>
<tr>
<td>3</td>
<td>-33,301</td>
<td>2.0</td>
<td>$40,000</td>
<td>$2,664,080,000</td>
</tr>
</tbody>
</table>

*negative difference in aggregate count reflects a reduction in overall number of homeless and a cost reduction (i.e. positive gain on investment)

Model 1 Assumptions: PIT multiplied by factor of 3.0 to account for prevalence average net cost savings of homeless exit: $50,000

Model 2 Assumptions: PIT multiplied by factor of 2.5 average net cost savings of homeless exit: $45,000

Model 3 Assumptions: PIT multiplied by factor of 2.0 average net cost savings of homeless exit: $40,000

Cost of Investment = FY 2010 - 2013 VHA Homeless Programs Office Obligated Budget: $2,637,158,000

Return on Investment Formula: \[
\text{(Gain from investment)} - \frac{\text{(Cost of Investment)}}{\text{(Cost of investment)}}
\]

Model 1 ROI = \[
\frac{4,995,150,000 - 2,637,158,000}{2,637,158,000} = +89.4 \text{ percent}
\]

Model 2 ROI = \[
\frac{3,746,362,000 - 2,637,158,000}{2,637,158,000} = +42.0 \text{ percent}
\]

Model 3 ROI = \[
\frac{2,664,080,000 - 2,637,158,000}{2,637,158,000} = +1.0 \text{ percent}
\]
The ROI modeling demonstrates positive return from the aggregated 4 year funding of the VHA Homeless Programs Office (FY 2010-2013), ranging from +1.0 percent using the most conservative of assumptions in the model to +89.4 percent using the most liberal assumptions. By comparison, large company, blue chip stocks average an ROI of 12 percent. The “true” return rate likely lies somewhere in the middle of this range, influenced by the proportion of chronically homeless, high-complexity, high-cost Veterans being placed in housing, a goal of Housing First, and the geographic region where the homelessness occurred, with high-volume/high-cost communities such as Los Angeles and New York City likely to generate both higher costs and greater cost offsets.

It should also be expected that differing combinations of prevalence and cost savings assumptions would generate ROIs in between these two estimates. These ROI calculations only considered one year cost-savings and would be expected to be greater if an accrual model or community benefit model were used instead. Similarly, assuming funding continues for the EVH initiative and the gap between actual and project PIT continues to widen, this ROI should be expected to grow.

CONCLUSION

In this ROI model, there are substantial positive returns on investment to the obligated funds budgeted to the VHA Homeless Programs Office. These returns are likely to be extended as the savings from deferred costs of homelessness accrue over time, especially for those otherwise chronically homeless Veterans and as continued progress is made at eliminating homelessness among Veterans compared to the baseline rate. While there are acknowledged limitations and assumptions made to this modeling, we feel that overall they reflect well-justified, evidence-based and conservative estimates of the cost-benefit from this program. As data retrieval and data-set merging capacities develop overtime, we anticipate future analyses to generate more accurate cost and cost savings projections. However, in the interim, these analyses strongly suggest that the EVH initiative is both effective social policy and fiscal policy that is having a meaningful impact within our local communities and with Veterans in-need.

REFERENCES

(1) M. Schmidt “Return on investment (ROI): Definition, meaning and use” http://www.business_case_analysis.com


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Opinions expressed in this white paper represent only the position of the National Center on Homelessness Among Veterans and do not necessarily reflect the official policy of the U.S. Department of Veterans Affairs.

Promoting data-driven, evidence-based solutions to end Veteran homelessness

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