Evaluation of an integrated housing and recovery model for people with severe and persistent mental illnesses: the Doorway program

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Abstract

Introduction: The Doorway program is an innovative 3-year pilot housing and recovery support program aimed at people with a severe and persistent mental illness who are 'at risk' or actually homeless. Participants obtain housing in the open rental market through a rental subsidy. The study aims to determine Doorway's impacts on participants' wellbeing, service utilisation and potential cost savings to government.

Methods: Pre-post study design with measurement of health, housing, employment and social inclusion as outcome variables. A cost appraisal was based on all measurable health service utilisation and housing support.

Results: For 55 (of 59) participants, total mean BASIS-32 (including 3 of 5 subscales) and total mean HoNOS mental health scores significantly improved, as did four of ten domain scores of the Outcome Star (Homelessness) inventory. Mean usage of bed-based mental health clinical services and general hospital admissions both significantly decreased (associated with overall net savings of A$3,096 per participant pa). Overall cost savings range from A$1,149 to A$19,837, depending on housing type comparator.

Discussion and Conclusion:

Doorway secured subsidised rental housing for this vulnerable group and had additional benefits in client outcomes and reduced use of health services. There were substantial potential cost savings to government.

(198 words)

Keywords: health services research, health funding and financing, mental health, models of care.

Key Question Summary

1. *What is known about the topic?* Beneficial impacts of housing and recovery programs on people with severe and persistent mental illness and who are 'at risk', or actually homeless, are being demonstrated in Northern America. These impacts include housing security, wellbeing, health service utilisation and cost effects on government. These findings though, can only be regarded as settled for housing security.

2. *What does this paper add?* This paper adds new data on the impacts of these programs, particularly with regard to behavioural distress, general health and social functioning in these mentally ill people as well as on potential cost savings to government.

3. *What are the implications for practitioners?* The beneficial impacts demonstrated give added impetus for the funding of housing and recovery programs for these mentally ill people.

Introduction

It is of concern that the recent Australian Study of High Impact Psychoses (SHIP) found that 5.2% and 12.8% of individuals with a psychotic illness had been homeless in the previous month and previous year respectively, the latter with a mean of 155 homeless days.[2,3] Homeless people frequently do not have the financial resources or appropriate references to gain private housing tenure. Public housing waiting are often long and often availability is not in locations preferred by applicants. This further alienates them from social contacts and engenders a sense of isolation and disengagement from society. The importance of housing tenure in contributing to the recovery of individuals with a severe and persistent mental illness (SPMI) is clear.[4]

Doorway is a three-year pilot housing and recovery support program delivered by MI Fellowship. It is designed to enhance the capacity of individuals with a SPMI requiring services and who are homeless or at risk of homelessness, to lead independent, healthy and meaningful lives in housing and communities of their choice. Homelessness in contemporary Australia should be understood to consist of a number of (identified) arrangements for shelter below a minimum community standard. This is a small rented flat with separate bathroom and kitchen and an element of security of tenure.[5] The Doorway program integrates interventions to improve the client's housing situation with efforts to improve social inclusion and support recovery.

The Doorway model builds upon, and adapts the Housing First model that was pioneered in the United States in the early 1990s.[6] These models are built upon the assumption that stable housing plays a critical role in the recovery of people with SPMI. A number of large randomised control trials based on the Housing First model have now been conducted in Canada as part of the 5-cities At Home/ Chez Soi Trial. They indicate consistent improvements with residential stability, social inclusion and reduced contact with the justice system.[7,8] Impacts on levels of quality of life and substance abuse show more mixed results.[9,10,11] The research literature overall makes clear that the Housing First model has demonstrated real and substantial social benefits to participants.

A key difference between the Doorway model and other iterations of the original Housing First model is that participants source and choose properties through the open rental market, rather than through properties owned or managed by Housing First providers.

The aims of the study are to determine the impacts of the Doorway program on individuals' wellbeing (health, housing, employment and social inclusion) as well as to perform an appraisal of cost savings to government.

The Doorway program

As stated, the Doorway model supports participants to choose, access and sustain their own private rental accommodation by subsidising their rental payments where

required. In addition, Doorway's Housing and Recovery Workers (H&RWs) support participants e.g. to develop tenancy skills and build natural support networks. The Doorway H & RWs are graduate level staff, intentionally including some people with a lived experience of mental illness and/or homelessness. Integrated support teams are created for each Doorway participant.

The Doorway pilot was implemented with three clinical partners across inner city and suburban Melbourne as well as in country Victoria between July 2011 and June 2014. These clinical partners were Austin and Repatriation Medical Centre as part of Austin Health (covering Cities of Banyule and Nillumbik), St Vincent's Hospital as part of St Vincent's Health (covering the City of Yarra) and Latrobe Regional Hospital as part of Gippsland Health (covering Baw Baw Shire and Latrobe City Council). The demographic characteristics, levels of social and economic disadvantage and rental affordability as well as mental health characteristics of participants differ across each region, sometimes being better, sometimes worse than those in Victoria overall. The program was funded for a 3-year period (30 June 2011 - 30 June 2014).

Methodology

The study employed a pre-post design and encompassed both quantitative and qualitative dimensions. The evaluation period concluded in November 2013, 7 months before the end of the 3-year funded period at the request of the funding body.

Inclusion criteria for admission to the program were:

- Severe mental illness requiring services from an Adult Mental Health Service;

- Homeless or at risk of imminent homelessness;

- Currently case-managed by an Adult Mental Health Service;

- Receiving a Disability Support Pension (DSP) or Newstart Allowance

Operational inclusion criteria were: Willing to accept support; Willing to give consent for members of the Integrated Team to share information with each other; Living in Doorway catchment areas; Needing to consent to data collection, sign a lease, and contribute to rental payments.

Data collection:

Baseline measurements were performed at entry to the program and then at 6-monthly intervals across the evaluation period.

Outcomes measurement tools: The *Behaviour and Symptom Identification Scale 32 (BASIS-32®)* is a consumer-oriented, self-report measure of behavioural symptoms and distress. It has five subscales and 32-items, each with 5 point scales.[12,13] The *Health of the Nation Outcome Scale (HoNOS)* is an interviewer-administered measurement tool designed to assess general health and social functioning of mentally ill people.[14] It has 12 subscales, bundled under four headings (Behavioural problems, Symptomatic problems, Impairment, Social problems). Each item has a 5-point scale.

Outcomes Star (Homelessness) has ten domains measuring various aspects of the homelessness experience. These are internal motivation, social networks, managing money, offending, mental health, physical health, living skills, meaningful use of time, managing tenancy, substance abuse.[15]

Doorway staff collected both quantitative and qualitative data relevant to housing, employment and social inclusion. For *housing*, these included e.g. proportion of participant's housing preferences met, incidence and amounts of rental arrears, and breach of duty notices. For *employment*, variables collected included engagement in paid and unpaid employment, taken steps to find work and seeing an employment consultant such as an Australian Government-funded Disability Employment Service, accessing education and vocational training opportunities and receiving qualifications. For *social inclusion*, they included the composition of participants' natural support networks, contacts with, and attendance at court and contact with police.

Health system utilisation datasets: De-identified data from three Victorian Government Department of Health datasets was provided for participants in the program. These datasets were:

- the Client Management Interface/ Operational Data Store (CMI/ODS) which provides data on Victorian public mental health service usage;

- the Victorian Admitted Episodes Dataset (VAED) for data on Victorian hospitals usage; and

- the Victorian Emergency Minimum Dataset (VEMD) which provides data on ED usage.

Data were not available for ambulance call-outs, use of drug and alcohol services, or GP consultations.

Costs of mental health and general health services were derived from these client contact data in conjunction with unit cost data derived from the Victorian Government Department of Health as well as other published sources - see Table 1.[16,17,18,19,20] Doorway program costs were derived from Doorway program funding documents – see Table 1. These included Doorway client support costs, rental subsidy support as well as program management and operational costs.[21,22] These clinical and housing components were valued at $10,136 and $7937 per participant pa respectively. Together with program management and operation costs of $1228, these totalled $19,300 per participant pa.

Housing costs for homeless people in Australia (other than Doorway) were obtained from published data – again see Table 1.[23,24] Full cost data is available elsewhere.[1]

Selected social and demographic characteristics of the participants: These included: Sex, Age (mean), Country of Birth, Aboriginal or Torres Strait Islander status, Identified carer (at point of referral), Parent (single or couple), Receiving Disability Support Pension payments at January 2013; Mean fortnightly income at January 2013.

Data analysis:

Analysis of HoNOS, BASIS-32 and Outcomes Star Homelessness measures compared scores for individuals at their entry and exit to the program - relevant quarter year ±3 months if scores unavailable. If multiple scores in the same quarter, mean scores were used. Null values assumed to correspond with 0 rating.

 The time of exit used varied slightly for individual measures - legends of the relevant tables should be consulted for details. Utilisation and cost data was also compared at program entry and end. Following normality checking and the removal of outliers, statistical analysis of continuous variables was conducted using paired sample t-tests, where paired continuous data existed. Categorical data were assessed with chi-squared tests generally with unpaired data. All analyses were undertaken with SPSS V22.0.

The project obtained ethical approval from Austin Health's Ethics Committee with matching approval from Ethics Committees at both St Vincent's and Latrobe Hospitals. Participants on entry to the program provided signed approval for the access of their deidentified clinical and other relevant data. Victorian Data Linkages (VDL) provided this deidentified data to the study team.

Results

Study population and throughput

During the evaluation period, 77 people went through the intake process and of these, 59 took up residence in private rental properties under the program, with 50

still in residence at the end of the evaluation period – see Figure 1. Analyses are based on available data for 55 of the 59 participants (Austin 20, St Vincent's 12 and Latrobe 23). As recorded by Doorway program staff, reasons for early exit included:- social - improved outcomes (re-connecting with family); financial sustainability (living with someone else etc.); health – reached recovery sustainability, increased support needs.

Selected social and demographic characteristics of the participants are set out in Table 2. These show that participants were most commonly Australian-born, single middle-aged males receiving a Disability Support Pension. Schizophrenia (49%) (followed by Depression (25%)) was by far the most common primary mental health diagnosis. More than one third of participants had multiple mental health diagnoses. Based on their Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) scores, the most common problems were tobacco products (60% moderate risk; 20% high risk) and alcoholic beverages (60% moderate risk; 7% high risk). Cannabis and amphetamine type stimulants use was also common.

Prior to entering the program, based on the Chamberlain definition of homelessness

- 17% of participants were 'primary homeless' ie without conventional accommodation.

- 50% were 'secondary homeless' i.e. moving between various forms of temporary shelter.

- 21% were 'tertiary homeless' i.e. living in single rooms in private boarding houses. (Chamberlain et al., 2003).

- 10% were 'marginally housed'. This is a category used by the Australian Bureau of Statistics and refers to living in housing situations close to minimum standard.[5]

Participants had moved an average of 2.6 times in the three years prior to study entry and 28% were on the public housing waiting list. The most common primary cause for their homelessness was their mental illness (50%), followed by relationship breakdowns (15%). Three participants had been previously long-term residents of a state-funded Continuing Care Unit, (community-based treatment facility).

Health-related outcomes

BASIS-32: Total mean BASIS-32 scores significantly decreased (improved) across the evaluation period from 1.3 BASIS points, pre-Doorway to 0.8 points post-Doorway (P=0.04) (n=23). Scores decreased i.e. improved for each of the five sub-scales – three statistically significantly so, *Relation to self/others* (P<0.001), *Depression/anxiety* (P=0.01) and *Daily living/role function* (P=0.02) - see Figure 2.

HoNOS: The mean total score significantly decreased (improved) (P <0.001) from 10.0 pre-housing to 8.8 post-housing (out of a maximum score of 48) (n=35). Mean scores improved across three of the four HoNOS domains though none significantly so – see Figure 3.

Over the period of engagement with the program, there was one incident relating to a possible overdose, one relating to self-harm and six relating to medical concerns, physical assault and anti-social behaviour.

Homelessness and housing outcomes

There were statistically significant improvements for four of the Homelessness Star's ten domain scores: These were *Motivation and taking responsibility* (P=0.00), *Managing* money (P=0.01), *Emotional and mental health* (P=0.01) and *Meaningful use of time* (P=0.01). There were improvements in all six of the other domains but these were not statistically significant - see Figure 4.

The period of time that participants were housed in rental accommodation ranged from three to 21 months.

The majority of participants' housing preferences (proximity to family, health services and community resources) were met in the rental accommodation that they eventually occupied. By the end of the evaluation period, 31 (56%) participants had received 12-month lease extensions by their Property Managers with three more on a month-to-month basis. The mean rental gap paid by Doorway to participants was $194 per fortnight across the evaluation period and this remained relatively unchanged.

With regard to adverse events, 11 (20%) of Doorway participants had fallen into rental arrears on at least one occasion. There had been ten breach of duty notices issued; numerous verbal warnings and some complaints from neighbours and three instances of property damage and six instances of lease breaks, Only one participant had any utilities disconnected during the evaluation period.

Employment and training outcomes

There were modest improvements in outcomes for the proportion of participants engaged in paid and unpaid employment, taking steps to find work, seeing an employment consultant, accessing education and vocational training opportunities and receiving qualifications for their vocational training. These improvements though were not significant.

Social inclusion anti-social behaviour outcomes

The composition of participants' natural support networks evolved over time. The increase in contacts with 'Others' such as neighbours, work colleagues, and local shop and café owners rose from 14% to 59% and was significant ($\chi^2(1)=7.72$, $P<0.01$). There was also large increase in contacts with 'Friends' from 45% to 68% but this was not significant ($\chi^2(1)=1.42$, $p=0.23$).

Eleven (20%) of Doorway participants had had 19 reported contacts with the court system related to criminal or civil matters with the majority resulting in positive outcomes such as intervention orders not being placed or lifted. Eleven (20%) participants had 21 reported contacts with the police with charges were laid in only one case.

Utilisation and cost of health services including the Doorway program

Admission to bed-based mental health services (clinical and community) decreased substantially (from 1.2 to 0.5 admissions per participant pa) (t(50)=3.01, p<0.1).

There was also a substantial decrease in *total average bed days of bed-based mental health services* from 20.0 to 7.4 days per year per participant pa (n=51) (t(50)=2.81, p<0.01). Cost savings to government based on reduction in their bed-day usage were estimated at $7355 per participant pa - see Table 3.

Contact with ambulatory mental health professionals decreased from 39.4 to 33.5 mean hours per year per participant. The greatest reductions were in services provided by Mobile Support and Treatment Teams (MSTT) and Continuing Care Teams (CCT). There was an estimated saving of $1,882 per participant per annum to government.

Sixteen (33%) of the 48 participants enrolled in the Doorway program at the end of the evaluation period had been formally discharged from their Adult Mental Health Services to GP or similar care. Six of the nine participants, who had been subject to Community Treatment Orders (CTO) at program intake, had these lifted.

The *total number of Emergency Department presentations* decreased (1.94 to 1.42 per participant annually) (t(50)=1.75, p=0.09). ED presentations leading to admission decreased from 0.50 to 0.21 per participant annually and ED presentations not doing so, decreased from 1.48 to 1.23 per participant annually. Using available costs estimates, savings associated with ED presentations to government were $349 per participant per annum – see Table 3.

The *total number of general hospital presentations* decreased (0.45 to 0.12 annually per participant) (t(50)=3.12, p<0.01). Estimated savings to government in hospital admissions per participant annually was estimated at $1447 – see Table 3.

Summary for all health service usage cost savings: Based on the above estimates of health service utilisation costs, savings to government relating to all health service usage (excluding Doorway direct client care services) were estimated at $11,033 per participant per annum. When Doorway direct client care services estimated at $7,937 were included, cost savings to government were reduced to $3096 per participant per annum.

Costs associated with housing:

Annual housing costs per Doorway participant can be compared against the costs of different types of social housing - see Table 4. Where the cost of capital to Government is available and included, the total housing cost per Doorway participant per annum of $10,136 (as part of the total Doorway funding of $19,300 per participant per annum) was lower than the annual costs of all types of social housing. Approximately one-third of Doorway participants resided in some form of social housing prior to joining the program.

All cost savings:

Total cost savings also take into account Doorway managerial and operational costs ($1,228 per participant annually). These are shown per participant per annum in comparison with various forms of social housing in Table 4. This table indicates that

Doorway produced overall net savings, the magnitude of which depended on the form of housing type used as comparator. These were estimated to be at least $1,149 (for community housing). This is an underestimate as government investment capital costs for community housing were not available and were excluded. Cost savings were as high as $19,837 when crisis accommodation housing was used as the comparator.

Discussion

The program reported here was effective in securing subsidised rental housing for 59 people from this vulnerable group. It had additional benefits in terms of significantly improved client outcomes (total mean BASIS-32 and HoNOS scores as well as four of the ten domain scores of the Outcome Star Homelessness scale). Other improvements occurred in the areas of housing, employment and training, social inclusion and anti-social behaviour, some were significant, others were not. There was also a reduction in the use and cost of mental and general health services as well as in the costs of housing. Mean levels of rental subsidies though, at the time of evaluation, had yet to decrease substantially. Adverse events associated with their tenancy as well as anti-social behaviour continued among a minority of participants.

These findings relating to improvement in behavioural function and distress of participants and clear-cut savings to government make an important contribution to the Housing First literature. This is because the impact of the Housing First model on behavioural function and distress of people with a SPMI who are homeless or at risk of being so, has only infrequently been a primary focus of studies to date.[25]

Regarding savings to government, a well-designed randomised control trial reported that offering housing and case management to homeless adults resulted in fewer hospital days and ED visits compared with usual care though this involved a homeless population with chronic medical illnesses, not chronic mental illnesses.[26] Savings to government in relation to homeless people with chronic mental illness are relatively few and, if anything, demonstrate additional costs to government.[27,28,29,11] It is unclear to what extent the cost findings in this study relate to the Australian innovation of participants sourcing and choosing properties through the open rental market, rather than properties owned or managed by Housing First providers.

The study has some limitations. These included the predominantly pre-post study design without control group. While it could be argued that it might have been possible to identify and possibly recruit a community-based population of homeless people with severe mental illnesses to form such a control group, this would have been very difficult. These include ethical difficulties if the study design involved withholding a program with benefits that are now established. They would also include controlling for the effects of potentially large numbers of confounding variables in two relatively small populations, either through randomisation, simple or propensity score matching. It was necessary therefore to accept an uncontrolled study design and to entertain the possibility that changes in outcome variables occurred for reasons other than entry to the Doorway program.

Other limitations were that the sample size of the Doorway participant population is relatively small making Type 2 errors possible. Some participants had short periods of time in the program limiting the magnitude of potential improvements in their outcome parameters (these were amplified by bringing forward the evaluation). Cost savings to government were potential and assume defunding of existing economically inefficient programs. They also excluded developmental costs. There was some missing paired data (pre-post) for some individual participants.

Word count: 3278 excluding abstract, references and figures.

References

1. Nous Group. Doorway – Summative Evaluation – November 2013 to the MI Fellowship. Melbourne: Nous Group, 2014.

2. Morgan V, Waterreus A, Jablensky A et al.. People living with psychotic illness in 2010: The second Australian national survey of psychosis. *Aust NZ J Psychiatr*y 2012; 46: 735-752.

3. Morgan V, McGrath JJ, Jablensky A et al.. Psychosis prevalence and physical, metabolic and cognitive comorbidity. Data from the second Australian national survey of psychosis. *Psychol Med* 2014; 44: 2163-2176.

4. Drake RE and Whitley R. Recovery and severe mental illness: description and analysis. *Can J Psychiatry* 2014; 59: 236-242.

5. Chamberlain C and MacKenzie D. Counting the Homeless 2001. Catalogue No. 2050.0. Canberra: ABS, 2003.

6. Tsemberis S, Gulcur L, Nakae M. Housing first, consumer choice, and harm reduction for homeless individuals with a dual diagnosis. *Am J Public Health* 2004; 94: 651–656.

7. Patterson M, Moniruzzaman A, Palepu A et al.. Housing First improves subjective quality of life among homeless adults with mental illness: 12-month findings from a randomized controlled trial in Vancouver, British Columbia. *Soc Psychiatry Psychiatr Epidemiol* 2013; 48: 1245-59.

8. Somers J, Rezansoff SN, Moniruzzaman A et al.. Housing First Reduces Re-offending among Formerly Homeless Adults with Mental Disorders: Results of a Randomized Controlled Trial. *PLoS* 2013; 8: e72946.
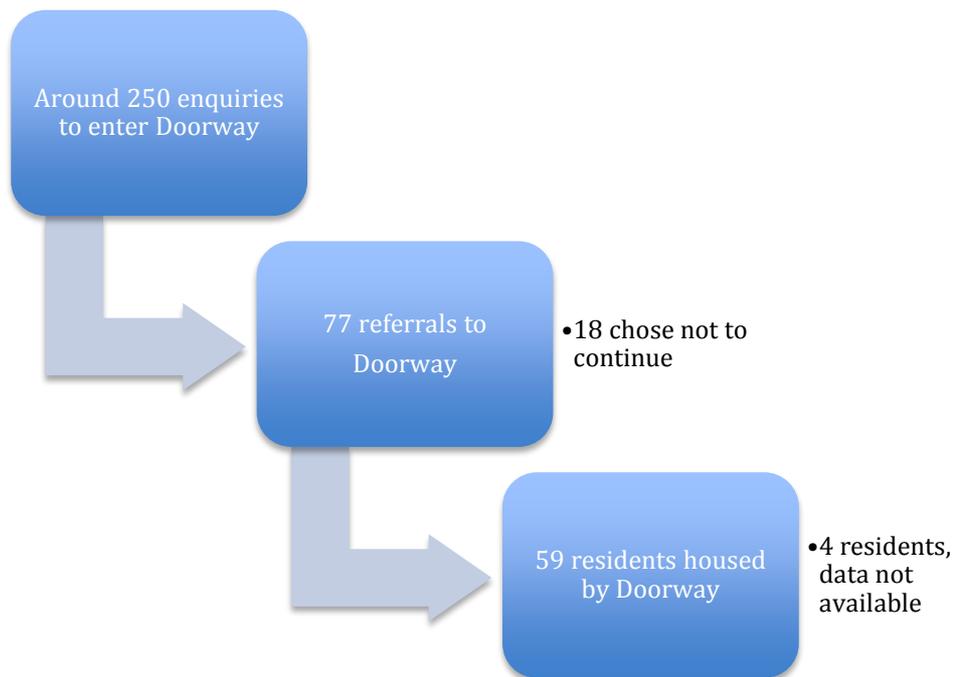
9. Kirst M, Zerger S, Misir V et al.. The impact of a Housing First randomized controlled trial on substance use problems among homeless individuals with mental illness. *Drug Alcohol Depend* 2015; 146: 24-9.

10. Somers JM, Moniruzzaman A, Palepu A et al.. Changes in daily substance use among people experiencing homelessness and mental illness: 24-month outcomes following randomization to Housing First or usual care. *Addiction* 2015; 110: 1605-14.

11. Stergiopoulos V, Hwang SW, Gozdzik A et al. (2015) Effect of scattered-site housing using rent supplements and intensive case management on housing stability among homeless adults with mental illness: a randomized trial. *JAMA* 313: 905-15.

12. Eisen SV, Dill DL, Grob MC. Reliability and Validity of a Brief Patient-Report Instrument for Psychiatric Outcome Evaluation. *Psychiatr Serv* 1994; 45: 242-247.

13. Eisen SV, Grob MC, Klein AA. BASIS: the development of a self-report measure for psychiatric inpatient evaluation. *Psychiatr Hosp* 1986; 17: 165-71.

14. Wing JK, Beevor AS, Curtis RH et al.. Health of the Nation Outcome Scales (HoNOS). *Brit J Psychiatr* 1998; 172: 11-18.

15. Triangle Consulting Social Enterprise Limited Outcomes Star (Homelessness) Available at: www.outcomesstarsystem.org.uk (accessed 2 November 2015) (2009-15).

16. Victorian Government Department of Health (undated). Client Management Interface/Operational Data Store service contacts Available at: https://www2.health.vic.gov.au/mental-health/research-and-

reporting/reporting-requirements-for-clinical%20mental-health-services/service-

contacts (accessed 3 Nov 2015).

17. Victorian Government Department of Health. Victorian health services policy and

funding guidelines 2010–11 - highlights. Melbourne: Department of Health,

2010.

18. Victorian Government Department of Health. internal costing data provided,

2013.

19. Independent Hospital Pricing Authority National Hospital Cost Data Collection

Australian Public Hospitals Cost Report 2010-2011, Round 15. Canberra:

Commonwealth of Australia, 2013.

20. Australian Institute of Health and Welfare Australian hospital statistics 2010–11.

Health Services Series no.43. Cat. no. HSE 117. Canberra: AIHW, 2012.

21. Mental Illness Fellowship. Proposal for Housing Pilot Project – July 2009.

Melbourne: Mental Illness Fellowship; 2009.

22. Victorian Government Department of Health. Housing Support and Brokerage

Demonstration Project. Melbourne: Victorian Department of Health, 2011.

23. SCRGSP (Steering Committee for the Review of Government Service Provision)

Report on Government Services 2013. Chapter 16 Housing Attachment tables,

Table 16A.19 and 16A.22. Canberra: Productivity Commission, 2013.

24. Zaretzky KP and Flatau P The cost of homelessness and the net benefit of

homelessness programs: a national study. Melbourne: AHURI, 2013.

25. Greenwood RM, Schaefer-McDaniel NJ, Winkel G et al. Decreasing psychiatric

symptoms by increasing choice in services for adults with histories of

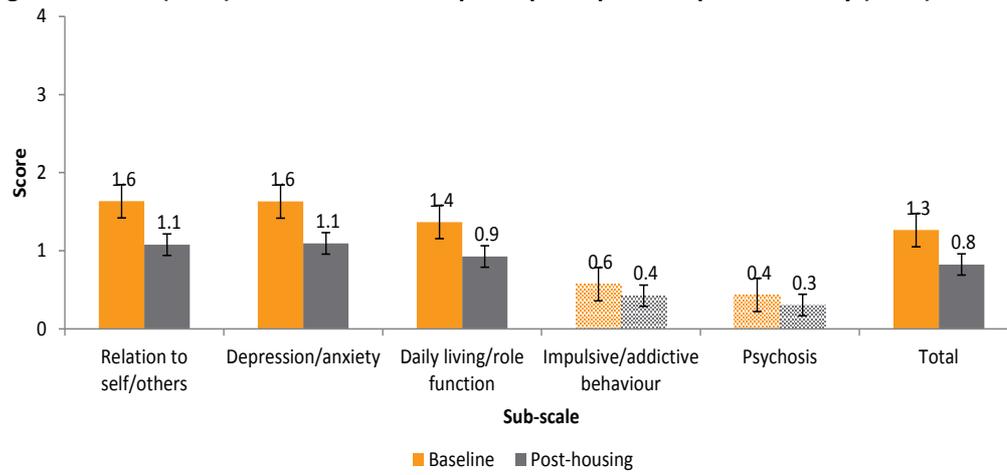homelessness. *Am J Community Psychol* 2005; 36: 223-38.

26. Sadowski L, Kee R, VanderWeele T et al.. Effect of a Housing and Case Management Program on Emergency Department Visits and Hospitalizations Among Chronically Ill Homeless Adults A Randomized Trial. *JAMA* 2009; 301: 1771-1778.

27. Rosenheck R, Kasprow W, Frisman L et al.. Cost-effectiveness of supported housing for homeless persons with mental illness. *Arch Gen Psychiatr* 2003; 60: 940-51.

28. Gilmer TP, Stefancic A, Ettner SL et al.. Effect of full-service partnerships on homelessness, use and costs of mental health services, and quality of life among adults with serious mental illness. *Arch Gen Psychiatr* 2010; 67: 645-52.

29. Gilmer TP, Stefancic A, Tsemberis S et al.. Full-service partnerships among adults with serious mental illness in California: impact on utilization and costs. *Psychiatr Serv* 2014; 65: 1120-5.

Figure 1. Flow of participants into and through Doorway program (n=55).

Around 250 enquiries to enter Doorway

77 referrals to Doorway

• 18 chose not to continue

59 residents housed by Doorway

• 4 residents, data not available

Figure 2. Mean (& SD) BASIS-32 scores for participants pre- and post-Doorway (n=23).

Shaded sub-scales have changes in means that are not statistically significant (P > 0.05).

Figure 3. Mean (& SD) HoNOS scores for participants pre- and post-Doorway (n=35).
a) sub-scales
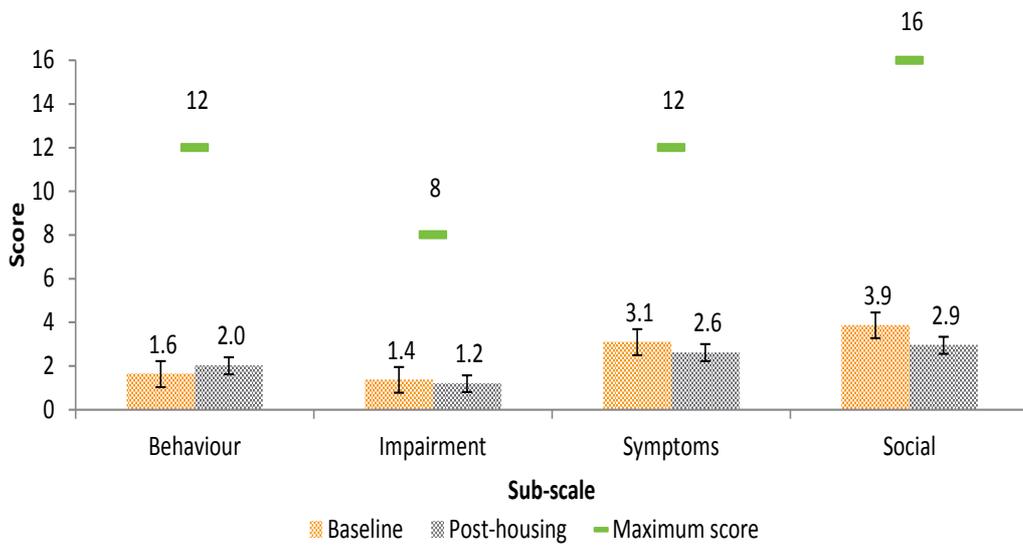
Shaded sub-scales have changes in means that are not statistically significant (P > 0.05).
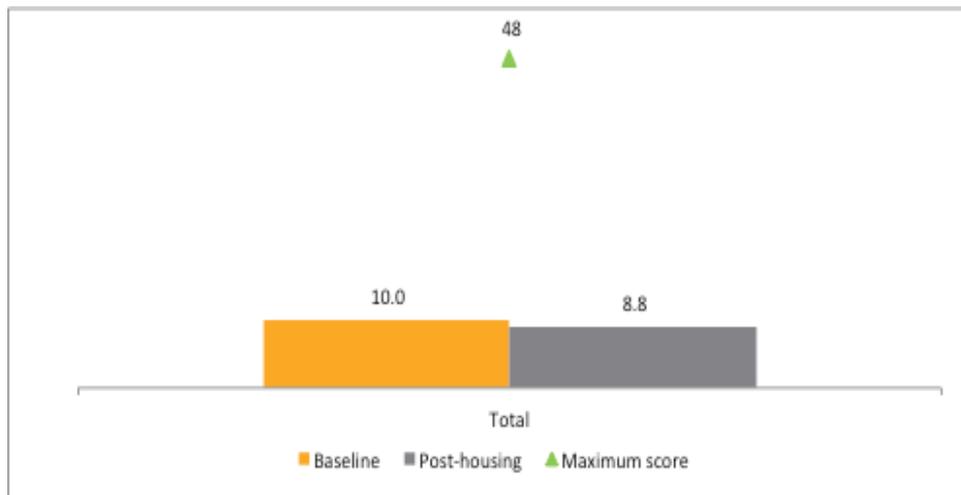
b) total scores

Figure 4. Mean (SD) Homelessness Star scores pre- and post-Doorway (n=29).

	Intake	Nov-13
1. Motivation and taking responsibility	6.1	7.1
2. Self care and living skills	7.0	7.7
3. Managing money	6.5	8.0
4. Social networks and relationships	6.4	7.2
5. Drug and alcohol misuse	7.8	8.2
6. Physical health	6.3	6.9
7. Emotional and mental health	6.0	7.0
8. Meaningful use of time	5.6	6.8
9. Managing tenancy and accommodation	7.6	8.3
10. Offending	9.2	9.5

■ Intake ■ Nov-13
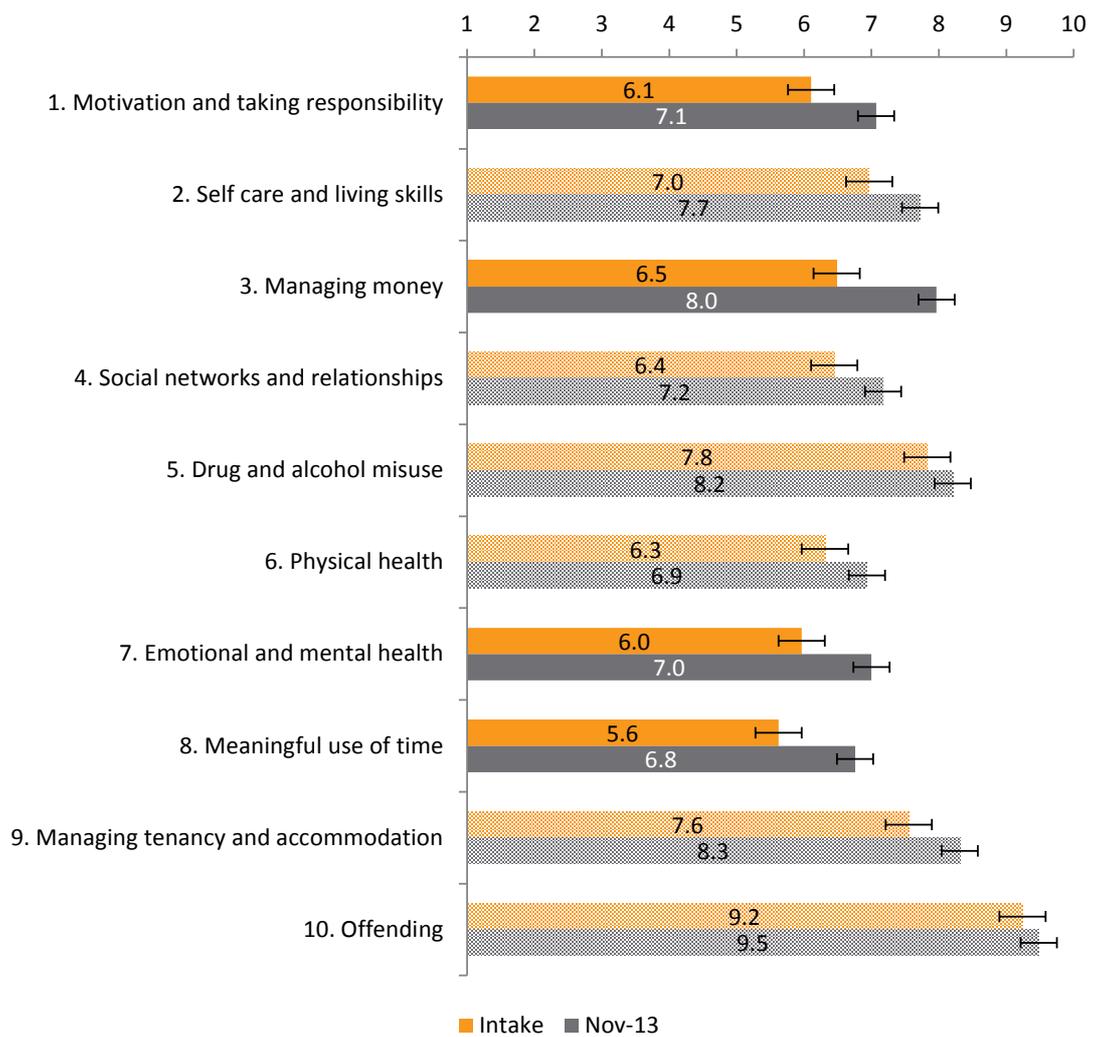
Shaded sub-scales do not involve significant changes. An increase in a score represents improvement.

Table 1 Cost data and sources for Doorway and other programs and services

Client support service	Source of Unit Costs
Bed-based mental health services costs,	Unit costs based on Victorian health finance documents[16,17]
Ambulatory clinical mental health service unit costs	Unit costs were estimated assuming an hourly funding cost of $320/hour[18]
Emergency Department	Unit costs based on mean national costs per presentation of $865 (triaged – admitted) & $395 (triaged – non admitted)[19]
Daily costs for hospital admissions	Case-mix-adjusted hospital separations. In Victoria in 2010–11 this was estimated as $4508.[20]
Doorway H&RW client support costs	Doorway program funding documents;[21,22] Standard Home-Based Outreach Support (HBOS) through Victoria's Psychiatric Disability Rehabilitation and Support Services (PDRSS). These are valued at $7937 per participant pa.
Housing services	
Doorway rental subsidies	Doorway program funding documents. Budgeted rather than the actual costs of Doorway were used, since budgeted costs will have been used in costing other forms of social housing.
Housing costs for homeless people in Australia (other than Doorway)	Published data.[23,24] All social housing costs (Doorway and alternatives) included recurrent and capital costs with the exception of community housing (data not available).

Table 2. Socio-demographic indicators for participants (n=47)[%].

Indicators	Data
Demographic	
Male (%)	68%
Age (mean)	39
Born in Australia	91%
Identify as Aboriginal or Torres Strait Islander	2%
Family background	
Identified carer (at point of referral)	30%
Parent (single or couple)	8%
Social and economic disadvantage	
Receiving DSP payments (at January 2013)	78%
Mean monthly income (at January 2013)	$956

[%] Excludes participants who have left the program prior to March 2013.

Table 3. Savings associated with health services usage per participant per annum.

Health services type	Mean reduction per participant per annum$^{\%}$	Daily cost estimates	Cost savings
Mental health bed-based (bed-days)	12.9$^{\%}$	$407-796	$7,355*
Adult Inpatient	7.6	$572	$4,323
Forensic	3.1	$796	$2,437
PARC	1.9	$407	$778
Specialist	0.3	$677	$203
Ambulatory mental health service usage (hours)	5.9	$320/hour	$1,882
ED presentation (number)	0.54	$865 (triaged admit) $395 (triaged not admit)	$349
Hospital separations (number)	0.32	$4,508	$1,447
TOTAL			$11,033

$^{\%}$ Community care Unit usage is excluded in calculating total reduction in service usage and costs. This was because 3 participants were previously long-term residents of these treatment rather than housing facilities, due to lack of housing alternatives, prior to joining the program and bias this analysis.

Table 4. Potential net savings to government per housing type per participant pa (2010–11).

Social housing type	Cost social housing type[%]	Doorway housing costs	Potential net housing saving	All costs saving (inc health and Other)
Public housing (per dwelling)	$26,802	$10,136	$16,666	$18,534
Community housing (per dwelling)[#]	$9,417	$10,136	-$719	$1,149
Crisis accommodation - Hostel style (per bed)	$16,060	$10,136	$5,924	$7,792
Crisis accommodation/transitional housing - Non-hostel style (per 2–3 bedroom unit)	$28,105	$10,136	$17,969	$19,837
Other supported accommodation (per apartment)	$21,900	$10,136	$11,764	$13,632

[%] Productivity Commission (2013); Zaretzky and Flatau (2013)

[#] Cost of investment capital not available