Systematic Review of Supported Housing Literature 1993 - 2008

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Systematic Review of Supported Housing Literature
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Review was conducted using a system for rating the rigor and meaning of disability research (Farkas, Rogers & Anthony, 2008). The first instrument in this system is: “Standards for Rating Program Evaluation, Policy or Survey Research, Pre-Post and Correlational Human Subjects Studies” (Rogers, Farkas, Anthony & Kash, 2008) and “Standards for Rating the Meaning of Disability Research (Farkas & Anthony, 2008).
Plain Language Summary
Systematic Review of Supported Housing

Supported housing for individuals with severe mental illness strives to provide the services necessary to place and keep individuals in independent housing that is integrated into the community and in which the consumer has choice and control over his or her services and supports. Supported housing can be contrasted to an earlier model called the “linear residential approach” in which individuals are moved from the most restrictive settings (e.g., inpatient settings) through a series of more independent settings (e.g., group homes, supervised apartments) and then finally to independent housing. This approach has been criticized as punishing the client due to frequent moves, and as being less likely to result in independent housing. In the supported housing model (Rog, 2004) consumers have choice and control over their living environment, their treatment, and supports (e.g., case management, mental health and substance abuse services). Supports are flexible and faded in and out depending on needs.

Results of this systematic review of supported housing suggest that there are several well-controlled studies of supported housing and several studies conducted with less rigorous designs. Overall, our synthesis suggests that supported housing can improve the living situation of individuals who are psychiatrically disabled, homeless and with substance abuse problems. Results show that supported housing can help people stay in apartments or homes up to about 80% of the time over an extended period. These results are contrary to concerns expressed by proponents of the linear residential model and housing models that espoused more restrictive environments.

Results also show that housing subsidies or vouchers are helpful in getting and keeping individuals housed. Housing services appear to be cost effective and to reduce the costs of other social and clinical services. In order to be most effective, intensive case management services (rather than traditional case management) are needed and will generally lead to better housing outcomes. Having access to affordable housing and having a service system that is well-integrated is also important. Providing a person with supported housing reduces the likelihood that they will be re-hospitalized, although supported housing does not always lead to reduced psychiatric symptoms. Supported housing can improve clients’ quality of life and satisfaction with their living situation. Providing supported housing options that are of decent quality is important in order to keep people housed and satisfied with their housing. In addition, rapid entry into housing, with the provision of choices is critical. Program and clinical supports may be able to mitigate the social isolation that has sometimes been associated with supported housing.
I. INTRODUCTION

Rationale for the Review.

Apart from treatment, there is probably no area of services that is more important for the rehabilitation and recovery of individuals with severe mental illness than the provision of housing and residential services. The last 30 years have witnessed a burgeoning of housing services and models of service delivery, much of which has been fueled by deinstitutionalization and the move toward community integration for individuals with severe mental illness.

In the past several years a few syntheses of housing literature have been undertaken (Newman, 2001a, 2001b; Fakhoury, Murray, Shepherd, & Priebe, 2002). In addition, in 2006, the Cochrane Collaborative proposed a systematic review in the area of supported housing for individuals with schizophrenia (Chilvers, Macdonald, & Hayes, 2006). Owing to the fact that the Cochrane Collaborative only includes articles for review if they are randomized clinical trials (RCTs), their systematic review on supported housing was attempted, but not conducted. The reviewers stated that they located no randomized trials of supported housing for individuals with schizophrenia.

Objectives of the Review

To review all literature related to supported housing for individuals with severe mental illness and to not limit the systematic review to only randomized clinical trials. The assumption for this systematic review was that there is important and significant literature that has been published in the field of supported housing that urgently needs to be synthesized for the mental health field. Despite not being able to employ RCTs, the study group presumed that there was valuable information that could be gleaned from these articles and that synthesizing the literature could be useful to stakeholders, end users, and other constituents in the mental health field.

II. METHODS AND PROCEDURES

The study group decided to include the following types of studies/publications/documents:

Any study (see definitions below) or documents describing effects of supported housing on individuals (supported housing defined as independent, non-transitional, non-congregate, integrated housing with supports; supported housing must be one of the conditions studied but could be compared to a non-supported housing condition).

We have encountered two major types of supported housing studies: those in which the housing is provided as part of the intervention and those in which supported housing services are provided by case managers, or similar personnel, and where access to housing is provided by Section 8 vouchers or some other mechanism. We have decided that as long as the goal of the case management (or similar service) is to provide
interventions/services/programs to keep study participants housed in supported housing settings, then the study should be included in the systematic review. Studies that focus on housing outcomes in which a supported housing intervention is being provided were also considered for review.

We included various subpopulations within the larger population of individuals with psychiatric disabilities, such as individuals with HIV, or who are elderly or mothers.

In terms of exclusion by research design, acceptable study designs included: pre-post evaluation, correlational, experimental or quasi-experimental, observational cohort, and survey research. (Determining the type of design was not without problems when designs were poorly described or poorly planned and executed. This lead to some difficulties in categorizing the designs used. For example, when correlational methods were used to address questions of effectiveness of an intervention, we coded that design as a pre-post or quasi-experimental design because of the intention of the researchers).

The study group excluded the following types of studies/publications/documents:

- Policy statements (not policy research)
- Needs assessments
- Instruments related to measuring housing outcomes
- Housing satisfaction
- Program models
- Conceptual models (e.g., Solomon’s conceptual model of community integration and housing)
- Process evaluations

The rationale for this exclusion was that such documents and articles, while important for the field, could not be subjected to ratings for their rigor and their meaning.

*Search Terms used:*
Supported housing
Supportive housing
Residential services
Transitional housing

All paired with serious mental illness, psychiatric disability, or mental illness. In addition to searching pubmed, Medline, psychInfo, and Google Scholar, we examined the citations contained in each article for additional potential articles and reports to review. All citations contained in the Newman review (2001a), the Rog review (2004), and the Fakhoury review (Fakhoury et al., 2002) that are summarized above as background material were carefully screened for inclusion.

Several papers are published on studies that primarily or secondarily focus on supported housing. One example is the Access to Community Care and Effective Services and Supports (ACCESS) study where the primary impetus was to promote service integration
and the expected outcome was on housing outcomes. Additional analyses of this study focused on service use outcomes (Rosenheck & Lam, 1997b), rather than housing outcomes. In studies like this, individual decisions about inclusion/exclusion were made to insure that the studies included focused on a supported housing intervention and outcome.

Two research assistants were responsible for querying the databases and locating articles. Titles of articles were initially scanned for relevance to the supported housing topic by the lead reviewer. If the title appeared relevant, the abstract was reviewed and if it was deemed likely to meet inclusion criteria, the article was obtained. A checklist of inclusion/exclusion criteria was completed for each article to facilitate tracking of articles screened. In some cases, once the article was reviewed, it was clear that the inclusion criteria were not met. Occasionally, one or more members of the study group had to be consulted to make a determination about including or excluding an article.

Once a complete list of articles for review was compiled, that list was sent to several experts in housing research. We asked those experts to review the list to insure that no relevant article or report was omitted. This step yielded several new citations that were appropriate for review.

In terms of unpublished articles, we did not include conference proceedings. We located two unpublished reports significant enough to be reviewed (one doctoral dissertation and one government report).

In the end, we considered 155 articles for inclusion. After various inclusion and exclusion criteria were considered, 80 articles were rated for quality and for meaning. Articles that were excluded from the review were those that did not examine a supported housing intervention or have outcomes related to supported housing, were review articles, policy statements and the like. A total of 12 studies were excluded from the narrative synthesis after rating for quality because methodology scores were low enough that the conclusions could not be considered robust or valid. Issues such as very poor research designs with major threats to internal validity, retrospective measurement, as well as very large attrition of study subjects were reasons for exclusion. (Note: the excluded articles appear in the reference list as italicized citations.)

The articles reviewed and included in the narrative synthesis were classified as primarily correlational (n=23), experimental (n=26), quasi-experimental (n=8), and pre-post designs (n=11). In addition to rating supported housing studies for rigor and meaning, we attempted to rate the fidelity of the housing intervention using the principles put forth by Rog (2004). These principles include the separation of housing and clinical services, the availability of crisis services, the affordability, independence, permanence, and integration of the housing, and the degree of choice available to residents in terms of their living arrangements and services. While information was not always available to rate these criteria directly, an attempt was made to determine whether the supported housing program described in the study were faithful to these principles at the levels of low,
medium and high adherence particularly when the study was focused on a test of the effectiveness of the supported housing model.

**Ratings of the Quality of the Research**

Quality of the research for this systematic review was determined by examining both the rigor (traditional indicators of the quality and appropriateness of the methodology) and the perceived meaning of the research (that is, the perceived utility and meaning the research has for the field, for policy makers and providers, and for consumers and family members).

Of the 80 articles rated for rigor (see Appendix for Rigor Scale), 12 were excluded from the narrative synthesis based upon their poor scores in the methodology section. Studies that employed weak designs for the questions they were addressing or had severe threats to internal validity were excluded. Results suggested that the highest average scores were in the introduction and rationale for the studies. That is, most authors were able to effectively establish the need for their study and review extant literature in their field resulting in a coherent argument for the need for the research. The methodology and the discussion sections resulted in the lowest ratings with some average methods ratings being just barely rated adequate (3.00). Particularly, the description of the independent variables, details on data collection, the handling of the data including the handling of missing data, the description of the control conditions and the information provided on the measures were all on average, less than adequate.

Many authors did not adequately describe the limitations of their research and the parameters of their ability to generalize their findings, resulting in ratings for the discussion section that were on average, lower than adequate. We used as a cutoff any study that scored a 2.0 or below for the major methodology item (“Study/research uses rigorous or sound research methods that allow the questions of interest to be addressed”) so that any study which scored a 2.0 or below on this item was excluded from the narrative synthesis.

Because we are using an innovative approach to rating meaning or perceived utility for this project, ratings of meaning (see Appendix for Meaning Scale) were not used to exclude articles from the narrative synthesis but rather to get a preliminary sense of whether and how the meaning of the studies reviewed could be rated using this newly developed scale. The first section of the Meaning Scale rates how much consumers are involved in the research study.

Overall, results suggested that consumers are frequently not involved in the design, implementation or review of research studies (or that information is not being reported by authors). We also rated whether information was collected and presented in the article using the World Health Organization framework for reporting functioning, disability and health. Ratings in that section suggested that data are presented on indicators of health and role functioning quite often (86% of the time and 79% of the time respectively). But data was presented much less frequently on environmental factors related to activity or
participation. We also rated whether the authors of the article articulated implications of the research for various levels of stakeholders, including policy makers, service providers, practitioners, consumers, and families. Implications of the research for policy are fairly frequently presented in the articles (42% of the time) and practitioners (45% of the time) and much more frequently for programs and services (74% of the time). Rarely do the authors discuss implications for the daily lives of individuals with disabilities, for their family members, or for underserved consumers (i.e., consumers receiving services in rural areas for example). In the final section of the Meaning Scale items ask about whether there is information, tools or other supports to put the intervention or information studied to use in the field. We found that about 55% of the time the authors spelled out one or more values underlying the intervention or service being studied, but other supports were virtually never present in the article (that is, supports such as materials or tools for implementation, costs of implementation or maintenance, help with translating the findings into practice or support for underserved populations).

**Time Period of the Studies and Research Covered.**

We considered any study published in the 15 years prior to the date of the systematic review (1993-2008). Data could have been collected prior to 1993 but any article reviewed would have had to have been published by 1993.

**Training of Reviewers.**

A total of 8 raters were used for this systematic review. All were individuals affiliated with the Center for Psychiatric Rehabilitation including research staff, the Executive Director, and post doctoral fellows in residence. However, the majority of the articles were rated by 3 raters.

Each rater was knowledgeable prior to the beginning of the systematic review about research methods so that the training focused on what kind of evidence for research quality might be encountered in a published article and what would be an acceptable indicator that quality had been achieved at each of the 4 points on the rating scale. All individuals were trained in the use of the rating scales by reviewing each item in the scale and discussing the meaning of the item and the evidence that could be considered for each indicator. Research articles were used as training devices by having each rater independently review articles and then discuss their ratings until agreement was achieved. Formal tests of inter-rater reliability were conducted and 75% agreement was reached. Early in the process of training, the reviewers’ consensus ratings were used between two members of the study group as a way of insuring that the most accurate and reliable ratings were being employed.

**III. RESULTS AND CONCLUSIONS**

**Background**
In the process of searching for articles to include in the systematic review, several articles were located that were not suitable for ratings of rigor and meaning because they were review articles themselves. Because these articles provided invaluable background information for the context of this review, we elected to summarize those 4 articles and their findings here.

Newman (2001a; 2001b) performed an extensive review of supported housing literature for the 25 years leading up to the review. The rationale for the review was that housing research failed to address critical policy questions and failed to build on previous research. As Newman (2001a) states: “each new article seemed to start over, with no conceptual framework to guide the research, and little if any building on past work” (ix). Newman critically reviewed the past 25 years of research on the role of housing. Only studies with specific measures of housing and neighborhood attributes were included in the review and housing types ranged from group homes to independent apartments. The three inclusion criteria for the review were that the studies use: 1) quantitative rather than qualitative methods; 2) a systematic sample with generalizability; 3) analytic techniques that meet basic standards of scientific rigor. She reviewed 32 studies and concluded that the majority suffered from one or more methodological weaknesses including poor instrumentation, unsystematic samples, and selection biases. She states that several studies relied on correlational analyses, therefore being unable to draw conclusions about cause and effect. She concluded that the systematic review of these 32 studies tells us little about housing for individuals with mental illness, particularly what attributes or factors are critical to a person’s capacity to live independently. Nor has the literature satisfactorily described the types of residential alternatives most effective for individuals with mental illness or identified the specific attributes of individuals systematically associated with the best residential settings. Researchers have not come to a consensus on the best ways to conceptualize and measure effectiveness.

Newman divided the research studies into three broad categories: those that examined housing as an outcome; those that examined housing as an input; and those that examine housing as both. In terms of the findings from the housing as input and outcome, she concluded from the studies conducted that race was a more powerful predictor of housing and neighborhood quality than was mental illness. Three studies suggested that there was no long term effect of improved housing adequacy on housing satisfaction above and beyond case management. Results of research are inconclusive about whether housing features affect residents’ satisfaction. Newman suggested that this latter finding be further tested with a more rigorous study. She further concluded that there is a need to better understand the relationship between housing satisfaction, mental health outcomes and service costs. Essential to the studies where housing is viewed as an input is the question of whether housing setting has therapeutic benefits that operate independently of the type, array and intensity of services provided. Studies to date provide conflicting results.

Newman demonstrated that we know very little about the effects of particular housing and neighborhood features on mental health outcomes. Even rigorous studies yield mixed results and more studies are needed. Research suggests that individuals with serious mental illness fare better in setting with fewer residents. Studies also suggest that residing
with other individuals with mental illness has beneficial effects. Findings to date suggest that disorganized-diverse neighborhoods are more welcoming to individuals with mental illness. Independent living is associated with greater satisfaction with housing and with neighborhood but additional research is necessary to clarify the relationship as noted above between housing, mental health outcomes and satisfaction.

Newman also describes the methodological issues needing attention in the next evolution of research on housing. These include clear hypotheses related to policy questions and a research agenda, valid and reliable measures, sophisticated data analytic techniques and the use of controlled trials wherever feasible.

As early as 1996, Rog, Holupka, and Brito summarized the literature on supportive housing. Focusing on the randomized trials that comprised the McKinney demonstration (some of which are reviewed below), they concluded that supportive housing increases stability, decreases hospitalization rates, and that individuals who are homeless and mentally ill can be housed in supportive residential settings. Intensive supports are more effective than less intensive supports. Some evidence exists to suggest that supportive housing with greater support was associated with greater quality of life. There is equivocal data on whether supportive housing leads to functional improvements with less controlled studies suggesting it does and more rigorous studies not finding improvements in social, vocational or daily functioning. Rog and her colleagues review the consumer preference literature and suggest that while most consumers state a preference to live alone rather than in a congregate setting, we do not yet understand the relationship between housing choice and housing outcomes. Finally, some studies have examined the features of the housing and suggest that housing quality (i.e., neighborhood features, physical features of the housing) has an impact on housing outcomes.

In a review of the housing literature, Rog (2004) examined 10 experimental or quasi-experimental studies, many of which are reviewed in detail below. She concluded that the evidence for the impact of housing on residential stability and hospitalization was strong. Regardless of the specific model employed, “housing with supports has a considerable impact on housing stability” (p. 338). The evidence for the greater impact of supported housing over other types of housing alternatives is not quite as strong, and was characterized by Rog as level 2 evidence (having less than 5 published studies with scientifically rigorous designs). In terms of cost studies, Rog concludes that only Level 3 evidence is available with few rigorous studies of costs and cost effectiveness of supported housing.

Responding to the increasing demand for the implementation of supported housing programs, British researcher Walid Fakhoury and his colleagues (Fakhoury et al., 2002) conducted a comprehensive review of the research on its effectiveness to examine whether the growing interest in supported housing was justified. The goal of the review was to provide a description of supported housing background, concepts and characteristics of its residents, as well as pave the way for future research by evaluating outcomes and factors influencing the quality of care and support provided by the programs. Their review included 28 empirical articles that encompassed European,
Australian and Canadian and American populations. Adopting a broad conceptualization of supported housing, the articles for review selected focused on supported housing programs in which the majority of residents were diagnosed with a mental illness and where housing and support were “intrinsically linked.”

Overall, Fakhoury and colleagues found that the field lacked a clear, coherent, consensual description of supported housing concepts. Realizing the seemingly insurmountable task of developing a collaborative definition within the field, Fakhoury’s team advocated for the identification of specific features of housing that discriminate between settings and predict outcomes rather than the inclusion of such a multifarious array of programs under the same umbrella. In comparing the characteristics of residents of supported housing to people with mental illness living independently or in semi-structured residences, Fakhoury and his colleagues found that the individuals in supported housing were more likely to be older, less educated, less likely to be employed, and more likely to be diagnosed with a psychotic disorder or experience compromised neuro-cognitive abilities.

Reiterating what has been found by other reviewers of the research in this area (e.g. Newman, 2001a; 2001b), Fakhoury and his colleagues reported that majority of research studies on supported housing are cross-sectional in design, making causal interpretations impossible. The authors also describe that relatively short follow up periods (from a few month to one year) employed by most studies, rendering them ineffective for determining meaningful changes. The field is also replete with studies with homogenous samples that prevent generalization beyond the individual study. Despite the apparent weaknesses of the available research reviewed, Fakhoury et al. still concluded that supported housing “can have beneficial effects.” Client satisfaction seems to be the strongest indicator of supported housing’s promising positive effects, but symptom reduction and decreased rates of hospitalization may also be affected. Social networks and social behavior data have been found to have an unclear impact by supported housing programs, with no straightforward evidence that supported housing is beneficial or possibly harmful in terms of social isolation and loneliness.

In regard to features of supported housing and their relationship to outcome, Fakhoury and colleagues reviewed the impact programs’ social and physical environment, staff levels and training, staff organization and staff-resident interactions. Privacy, independence, choice, convenient location and proximity to mental health services have been found to be more important to residents than their case managers. There is mixed evidence as to the effect that living alone or with others has on the psychological health of supported housing residents. Studies in the US found that staff training can lead to better service provision and fewer hospital admissions. As for staff organization, less restrictive housing regimes have been clearly shown to be related to greater satisfaction and quality of life among residents. Finally, staff/resident interactions that involve higher expressed emotion (mostly, criticism) result in poorer outcomes for supported housing residents.

**Measurement of Housing Outcomes**
Measuring an outcome as concrete and unambiguous as housing status would seem to be fairly consistent and straightforward across studies, time and locations. However, in reviewing the literature it became clear that this was not the case. The majority of recent studies focus their primary outcomes on “housing stability”; however, there is no consensus on the meaning of this term in the field. Often it is measured by the number of days in the target housing (e.g., independent housing) divided by the total number of days in the follow-up observation period. However, both the numerator and the denominator of this equation vary from study to study. The follow-up periods ranged from 90 days to over one year (and in one case, 5 years) so that comparisons of this figure from study to study is problematic and must take those differences into account. In addition, deciding what to count in the numerator as a day “housed” varies slightly from study to study. So for example, if a person experienced a brief hospitalization for a medical, substance abuse or psychiatric reason, studies may have counted that as a disruption while others may have considered it part of days continuously housed since the individual had not lost their housing. Additionally, confusion may arise from studies (often one’s that do not provide housing as part of their intervention) in which the researchers define being “housed” as essentially sleeping with any roof over one’s head, including living with a family member or in some cases, a shelter. In the majority of studies where housing was part of the intervention, researchers considered only independent housing as a “success” and not simply having a roof over one’s head. While a consensus appears to be converging around data collection methods which allow for the calculation of the number of days housed over a particular period, some earlier studies that were included in the review captured housing only for the individual at the particular time points (i.e., snapshots) at which data was collected, again making it difficult to compare across studies.

It would be helpful if the field could reach a consensus on one measure of housing stability that could be used across studies that that in turn could facilitate a meta-analysis based on future studies. In addition to “housing stability” a core set of related outcomes should be developed including the number of days homeless in a follow-up period, days or times hospitalized, time to first housing placement, number of residences occupying in a given period of time (i.e., number of residential moves), time to first failure (leaving a residence). All of these indicators of secondary outcomes, and more, appear in the literature. It would be useful if the field could come to consensus for a core set of these secondary measures as well as the primary measure of housing stability.

**Results of the Systematic Review: Experimental and Quasi-Experimental Design Studies**

Reviewed in this category were studies:

1) with an experimental design (including random assignment) and a supported or supportive housing intervention or an intervention designed to affect housing.
2) with an experimental design (including random assignment and an intervention designed to affect housing but that did not explicitly include a housing intervention (e.g., intensive case management).
3) with a quasi-experimental design.
4) where housing stability as primary outcome.
5) where cost was primary outcome.
6) where there were other outcomes.

Several large multi-site studies were the object of more than one study (for example, the large-scale ACCESS study and the McKinney study). In cases such as those the articles were reviewed as long as the outcomes reported on in the different articles were substantially different. A fairly large number of housing studies using an experimental design were located, including the McKinney housing studies (e.g. Goldfinger et al., 1999, Shern et al., 1997, Hurlburt, Wood, and Hough, 1996), studies funded by the VA (e.g. Rosenheck, Kaspraw, Frisman & Liu-mares, 2003), studies of homelessness in New York City (e.g. Susser et al., 1997, Tsemberis, Gulcur, & Nakae, 2004, Gulcur, Stefancic, Shinn, Tsemberis, & Fischer, 2003); several quasi-experimental designs were also available in the literature.

**Experimental Design Studies with a Housing Intervention.**

*Housing Stability Outcomes*

- In three early studies of supported housing there was evidence for the effectiveness of supported housing approaches. Homeless consumers recruited during a psychiatric hospitalization who were randomly assigned to supportive housing (rather than discharge services as usual) were hospitalized fewer days over the follow-up year and were less likely to experience a long-term hospitalization. Consumers in supported housing were more satisfied and more committed to their housing (Lipton, Nutt & Sabatini, 1988).

- In a study examining an intervention with low adherence to supported housing principles, comparing a residential and non-residential dually-diagnosed treatment program to a no intervention control group, essentially no significant effects were found. (Burnam et al., 1995). Because 40% of those assigned to treatment never attended, analyses examining the exposure to treatment to outcomes were conducted. Longer retention in residential treatment was significantly associated with better housing outcomes at 3 months, but seemed self-evident given that treatment participation included housing.

- Hulburt and his colleagues conducted an experimental study and found that participants having access to Section 8 vouchers were more likely to achieve stable independent housing and to achieve it more quickly (Hurlburt, Wood, & Hough, 1996). This was a 4-arm study which took place in San Diego, California (a McKinney study site) and where participants received Section 8 vouchers plus intensive case management; Section 8 vouchers plus traditional case management; intensive case management without vouchers; and traditional case management without vouchers. The authors randomly assigned either 90 or 91 individuals to each condition. Individuals in the experimental intervention had intensive case management in which the case managers had a maximum of 22 per caseload, used a team approach, were available around the clock, had more
frequent contact with participants, and provided more assistance in accessing services. (This intensive case management appears to have operated similar to an Assertive Case Management Team approach.) Individuals receiving traditional case management had case managers with higher caseloads, had less frequent contact with their case managers, and received less assistance with accessing services. The authors concluded that clients receiving comprehensive case management were no more likely to achieve housing stability than those with intensive case management. They also found that women reached “housing consistency” earlier than men and that psychiatric diagnosis was unrelated to housing consistency. Access to decent and affordable housing is the key to achieving housing outcomes and is much more important than case management. This was demonstrated by the fact that clients with access to Section 8 vouchers were 8 times more likely to achieve independent housing within the first 6 months than those without Section 8 vouchers. Almost 70% of clients achieved housing in independent or community residences; however, 10% of those moved frequently.

In a secondary analysis of the RCT performed by Hurlburt the authors examined the effects of both the intervention (Section 8 certificates vs. no certificates and intensive case management vs. traditional case management) and other demographic and clinical factors on housing stability. Housing was categorized into: 1) stable independent housing (client attains apartment or home within 18 months of project entry); 2) stable community housing (client attains another community residence within 18 months of project entry); 3) variable housing (client lives consistently in housing but does not stabilize in one setting); 4) unstable housing (client spends more than 10% of nights without housing and does not achieve stable housing during first 2 years of project); 5) Institutional settings (jail, prison, mental health setting); 6) Unknown (individuals housing status was unknown).

They found that almost 60% of participants with access to Section 8 certificates achieved stability in normal independent housing, compared with 31% of participants who did not have access to a certificate. Several variables were not related to housing outcomes, including clinical diagnosis and ethnicity. Females and those with a shorter homelessness history were more likely to be successful in remaining stable in housing. Drug and alcohol problems were strongly associated with a reduced likelihood of clients achieving consistent housing in the community. Among those with no alcohol or drug problems 66% were able to maintain stable independent housing and 13% other community housing. Only 21% were unstably housed. In contrast, among those participants with both alcohol and drug problems only 32% were able to maintain stable independent housing and 5% other community housing. Fully 63% were unstably housed. Type of case management (Assertive Community Treatment (ACT)-like or traditional) made no differences in housing outcomes which is contrary to later findings by other authors. The findings about the effects of substance abuse on unstable housing are also more pessimistic than the findings of Tsemberis et al. (2004), Padgett, Gulcur, and Tsemberis (2006), and Stafancic and Tsemberis (2007).

° At least one author found that substance abuse had a significantly negative effect on housing stability (Hurlburt, Hough, & Wood, 1996).
One study found that intensity of case management (intensive case management versus traditional case management) was not a significant predictor of housing stability (Hurlburt, Wood, & Hough, 1996); however, Section 8 certificates were also provided in this study.

In another McKinney demonstration site, Goldfinger et al. (1999) conducted a randomized clinical trial designed to compare independent apartments (n=55) to “evolving consumer households” (n=63). The independent apartments were operated by the Boston Housing Authority and offered voluntary weekly group programs, but there were no other on-site staff. The evolving consumer household followed the Fairweather Lodge Model in which participants lived in a group home with on-site staff in residence and which had decreasing levels of on-site staff. Participants had individual bedrooms with shared kitchen/living/dining areas. The onsite staff declined over time as consumers were able to administer the details of the household independently. All participants in both the experimental and control conditions had an intensive case manager that they saw at least once per week for counseling, had hands-on help with daily activities and help accessing needed services. Mental health services were provided at local community mental health centers. Overall the authors found that 76% of sample was in housing by end of the 18-month follow-up period, with no difference in housing rates by initial group assignment (note that in another analysis of the same study and data, Dickey, Latimer, Powers, Gonzalez, and Goldfinger,1997 stated that the retention rate was 81%). But those assigned to independent apartments showed a greater likelihood of later homelessness and greater number of subsequent days homeless during the 18 month follow up period than those in the evolving consumer household condition. This effect was driven largely by the discrepancy between minorities. That is, African American and Latino consumers assigned to independent housing experienced an average of 107 days homeless compared to 51 days homeless among African American/Latino consumers assigned to the group living situation. White consumers spent 48 vs. 36 days homeless in the independent vs. group living situation, respectively. The authors also found that the stronger the clinicians' recommendation at baseline for group living, the more days homeless the participant subsequently spent; and the stronger the consumers' preference was for independent housing, the more days homeless they subsequently spent (Goldfinger et al., 1999).

Another McKinney demonstration study took place in New York City and involved street-dwelling homeless individuals and the Choices intervention (Shern et al., 2000). Participants assigned to the Choices program (in which participants received access to resources such as showers/food, group activities, assistance in obtaining health care/social services, and developing rehabilitation plans, as well as exclusive access to a shelter at the YMCA and assistance in finding community-based housing) were compared to individuals who received standard care. Standard care involved a range of programs including outreach, drop-in centers, case management, soup kitchens, mental health services, and access to shelters.
Those assigned to Choices (N=91) showed a decline twice as great in the number of days spent homeless compared to those in the control group (N=73). Choices participants experienced a significant increase in the number of days housed in a shelter and number of days housed in community housing (including all ranges, from transitional to permanent housing and significantly and less time on the streets). A total of 38% versus 24% of the Choices and control samples respectively were housed in the community at the 24-month follow up. Choices participants showed improvements in quality of life, greater use of day programs, and reductions in psychiatric symptoms when compared to the control group, but no differences were found for mastery, self-esteem or service usage (Shern et al., 2000). Limitations of this study include high attrition, with only 69% of those randomly assigned able to be followed up.

In a review article, Shern et al. (1997) summarized housing status outcomes in the 4 sites of the McKinney study. Interventions varied across site. The proportion of participants housed in "community settings" (e.g., anything but the streets, a shelter or an institution) ranged from 40% (experimental) and 23% (control) in New York City to 88% (experimental) and 80% (control) in San Diego. Baltimore observed an 81% (experimental) and 60% (control) proportion, while Boston saw 83% and 76% housed in the 2 experimental conditions.

McHugo et al. (2004) reported on an experimental study of two approaches to housing (called parallel and integrated) for adults with severe mental illness who were at high risk for homelessness. A total of 62 individuals were randomly assigned to the experimental group ("parallel" housing) and 63 to the control group (integrated housing). Parallel housing was akin to supported housing principles and "integrated" housing was akin to more traditional housing approaches (the "linear residential model" or "continuum approach") which provided comprehensive health services through the integration of mental health care (intensive case management) and housing services. Fidelity assessments showed that relative to the integrated housing group, parallel housing was more likely to have consumers in housing owned by a community landlord, integrated within the community (meaning consumers were not segregated in housing) and to have tenancy not be contingent upon participation in clinical services. These factors are all important tenets of supported housing. All tenants received intensive case management based upon the ACT model, and ACT fidelity assessments showed that the case management services provided were similar in both conditions throughout the study. Both males and females in the integrated housing condition and females in the parallel housing condition remained in stable housing equivalently and were equivalently satisfied with their housing. Males in the parallel condition fared worse in terms of remaining in stable housing and being less satisfied with their housing when compared to all of the other three groups. Overall, at the 18-month follow up period, 68% of the individuals in parallel condition and 86% in the integrated condition were in stable housing; however, stable housing included independent housing but also group living situations.

In a study of the Housing First model involving homeless individuals in New York City, 225 (99 experimental and 126 control) individuals who were street dwelling or in an
institution were randomly assigned to the Pathways to Housing model of supported housing or a “continuum of care” model that adhered to the linear residential model of care (Tsemberis et al., 2004). The Pathways program was a modified Assertive Community Treatment model where a housing specialist coordinated housing services and housing and treatment were linked, but consumers were free to accept housing and decline clinical services. Participants were followed and assessed every 6 months for two years. Findings suggest that experimental subjects perceived more choice in their residential options, had significantly faster decreases in homeless status and increases in stable housing. Individuals in the Pathways to Housing condition perceived themselves as having more choice. A total of 80% of the experimental participants were housed at the 24 month follow-up period while only 35% of the control subjects were housed at that time. There were no differences in the two groups in psychiatric symptoms or substance abuse, or substance abuse treatment.  In a re-analyses of this randomized trial, Gulcur et al. (2003) concluded that the Pathways to Housing program cost $22,500 per year compared to approximately $40,000 to $50,000 for “treatment first” congregate housing programs. In another re-analysis of the 2004 RCT, Padgett et al. (2006) confirmed that after 48 months of follow-up, substance abuse did not differ between the experimental and control groups. They concluded that dually diagnosed participants can remain stably housed without increasing their substance abuse even in a housing program that does not demand sobriety or cessation of substance use.

Stefancic and Tsemberis (2007) examined the effectiveness of the Housing First model for long term shelter users in a suburban setting. They randomly assigned individuals to one of two experimental conditions: 1) Housing First run by Pathways to Housing who had experience delivering this housing intervention in NYC (n=105); 2) Housing First run by a consortium which was new to the model, but had delivered services in the suburban setting (n=104). The control condition (n=51) received services-as-usual. Each of the experimental conditions was expected to house only 60 individuals of the individuals referred but outreached and attempted to engage everyone in their sample (the authors report receiving additional referrals to the study, however, the results appear to focus largely on the original randomized sample). Housing First (the experimental condition) used an integrated and comprehensive approach through multi-disciplinary Assertive Community Treatment (ACT) Teams with 24/7 availability and a community focus.

The Housing First intervention run by Pathways to Housing was able to retain 57 out of 62 individuals originally placed at the end of the 20-month observation period. Similarly, the Housing First intervention run by the consortium placed 52 individuals and of those, 46 were housed the 20-month point. In terms of housing retention, 84% of consumers housed were still in housing at 2 years (88% in Pathways and 79% in the Consortium) while at 47 months the figures were 78% and 57% respectively. Housing retention rates demonstrate that the majority of clients in both Housing First agencies were able to end years of homelessness through this model.

In terms of the control condition, 21 individuals were lost to follow-up. Of the remaining 30 consumers, there was a significant amount of cycling in and out of shelters and
institutions. It appears that approximately 14 of the 51 originally randomized clients (about 27%) were known to be living independently (depending on how independent living is defined).

While the authors did provide cost data, they did not specify how the costs were calculated. Annual costs of supportive housing were $18,850 for the Pathways-delivered supported housing; $21,971 for the consortium-delivered housing and $24K to $43K for the care received in shelters. The limitations of this study include the fact that very minimal information was provided on how costs of housing were calculated and the study relied on administrative data which can present a limited picture of outcomes due to problems with missing or inaccurate data. In addition, there was little description of the handling of missing data. Further, it is difficult to assess selection effects. That is, individuals were randomly assigned to conditions, but those that became engaged in the interventions may have differed systematically from the original samples. The authors do not provide information about these possible selection effects.

Another important effectiveness study was conducted by Rosenheck and his colleagues using a Veteran’s Administration (VA) sample (Rosenheck et al., 2003) which was followed for a period of three years. The experimental condition in this study was the Veterans Supported Housing Program (VASH) combined with a Housing and Urban Development (HUD) Section 8 voucher program (n=182). Section 8 vouchers were combined with intensive case management using the ACT model. In a second experimental group (n=90) participants received intensive case management without special access to vouchers, though some were able to access these vouchers. Averaging across all three years of follow-up, the experimental group had 25% more days (59 days out of 90 or 66% of the time) housed than standard care and 17% more days housed than the case management control group. Experimental group veterans had 36% fewer days homeless; greater subjective quality of life in some areas, and, among those housed, experienced fewer housing problems. Those housed also experienced higher housing quality than services-as-usual (SAU) group, but not the case management (CM) group. The experimental group had larger social networks but experienced no other benefits in terms of clinical or community outcomes. The authors did subset analyses by diagnoses, length of homelessness, ethnicity and the basic findings did not change. Differential attrition from groups was a significant limitation (more control individuals could not be assessed at follow-up).

O’Connell, Kasprow, and Rosenheck (2008) re-analyzed data from the VASH study in order to examine individuals with a mental illness and a history of homelessness and their longitudinal risk of becoming homeless after being successfully housed and the factors associated with that homelessness risk. Homeless veterans with psychotic disorders, substance abuse or both formed 2 experimental groups: case management only and case management with housing Section 8 subsidies. The case management alone group had moderately intensive case management where the case managers had a maximum case load of 25 clients and used a modified ACT model, had weekly face-to-face contact and community based-care. The case managers made referrals to VA services such as
vocational training and substance abuse treatment. In the case management plus group, case managers had Section 8 vouchers and assisted the veteran in locating and securing housing. Retaining the apartment was not contingent upon involvement in VA treatment, although treatment was encouraged. The control condition was standard care which consisted of short-term broker case management.

O’Connell et al. (2008) examined the number of nights out of the previous 90 spent in each of 11 different types of housing. They used survival analyses to code the amount of time before a housing "failure" (those where client had spent at least one night out of the previous 90 homeless), versus "continuously housed" (no periods of homelessness) individuals. Compared with participants in the 2 other groups, participants who received case management and housing vouchers had a lower risk of returning to homelessness over the 5 year follow-up period, even after controlling for between group differences. The greatest risk for discontinuous housing was drug abuse at baseline. Having a diagnosis of post-traumatic stress disorder also was associated with a higher risk of homelessness. But, group assignment remained a significant predictor of homelessness even after accounting for these variables (drug abuse and diagnosis). Using median split analyses to compare individuals with higher scores of substance abuse, no intervention moderating effects were found among individuals with low levels of substance abuse, but among those with higher levels of substance abuse at baseline, those who received case management and housing subsidies were almost three times as likely to remain stably housed than those in the other two groups.

Compared with individuals in the case management only or the services-as-usual group, participants in the group with case management and housing vouchers reported higher levels of quality of life and lower levels of substance abuse and lower expenditures on substances at the time of their last interview (before being censored or completing the study).

Costs and Service Use

No differences were found between mental health service usage or hospitalizations over an 18 month period between homeless consumers randomly assigned to live either in a group home with staff trained to facilitate independence and decrease supervision as it was less needed (the Fairweather Lodge or Evolving Consumer Household model), or in independent apartments (one or two room apartments). Mean time housed was 81% overall. In both situations, consumers paid rent and had an individual caseworker (Dickey et al., 1996). In addition, when examining costs for the same study they found that treatment costs were lower for clients who remained where they were originally placed and concluded that housing stability decreased the need for treatment. The costs for the experimental condition were substantially more (almost double when all costs were considered) than for the comparison condition but treatment costs were not statistically different. The number of days institutionalized was the same for both groups (Dickey et al., 1997).
Another important cost effectiveness study was conducted by Rosenheck and his colleagues using a VA sample (Rosenheck et al., 2003). Overall findings suggested that veterans were able to achieve housing stability 66% of the days of a 90 day follow-up period and had 36% fewer days homeless. The first experimental condition in this study was the VASH (veterans supported housing) combined with a HUD Section 8 voucher program (N=182). Section 8 vouchers were combined with intensive case management using the ACT model. In a second experimental group participants received intensive case management without special access to vouchers, though some were able to access these vouchers (N=90). The control group was a SAU group (N=188). All told, 460 veterans participated in this study. Like the Dickey study, the experimental condition was more expensive to deliver (15% higher costs than SAU). However, total non-health care costs were 47% less than in the SAU condition. Experimental participants had improved housing outcomes and greater social contacts but no other benefits accrued to them. Differential attrition between the experimental and control groups (more attrition in the control group) compromised these conclusions somewhat.

Other Outcomes

Schutt, Goldfinger, and Penk (1997), as part of the McKinney study, investigated the effect of housing type and housing preferences, clinical status, social characteristics and personality on satisfaction with housing and life. They predicted that residential satisfaction would increase after receipt of housing among those assigned to independent housing when compared to those in group living. They also expected that housing satisfaction would be lower for those who receive a housing type that was markedly discrepant from their housing preferences. Receipt of housing and housing type was expected to influence housing satisfaction but not life satisfaction. Personal orientation and characteristics were expected to influence satisfaction with life but not housing satisfaction.

Experimental participants were housed in individual efficiency units in good condition housed in larger buildings. The control group participants were placed in group housing with 6-8 consumers that each had their own bedrooms. Following the Fairweather Lodge (and described earlier in the Goldfinger et al.1999 study) model, initially staff were there 24 hours a day but that intensity tapered off as residents were encouraged to take over the house management themselves (the “evolving consumer household”). All residents had clinical case managers in both conditions. Random assignment was made to the two conditions, but the number of those moving into housing was 118 while the total number assigned to housing was 196—a discrepancy which is not explained well by the authors. Data were collected up to 18 months post placement and included Satisfaction with Housing, overall and life in general (using the Lehman Quality of Life Interview Schedule). Residential preferences measured the individuals’ desire to move out of the shelter, preference for roommates and/or support staff available on their residential premises. Psychiatric diagnosis and psychiatric symptoms were collected using the Colorado Symptom Index. Neuropsychological functioning was examined using a composite of measures examining attention, general intelligence, school achievement,
and verbal memory. Social support was measured using Cohen’s Interpersonal Support Evaluation List. Personality was assessed with the MMPI.

The authors found that housing satisfaction did not vary as a consequence of the discrepancy between type of housing preferred and obtained. Residents who moved into independent housing were more satisfied with their housing but not more satisfied with life. There were significant limitations in this design with a discrepancy between the 196 assigned to housing and the 118 eventually moving into the housing. There is no discussion as to why 40 participants of the 196 screened and randomly assigned to housing subsequently refused to participate and whether they did not participate because they did not like their housing assignment. Another 38 were reported to have found other accommodations. This raises again the question of whether they did so because they didn't like their housing assignment. These two subsets of participants could have caused a selection bias in the samples studies. Further, there was no mention of how those lost to attrition were handled in analysis.

Because of the controversy surrounding whether a supported housing intervention can affect clinical outcomes, and the findings of Rosenheck and his colleagues from the VASH study that it does not, Cheng and his colleagues (Cheng, Lin, Kasprow & Rosenheck, 2007) reanalyzed data from the Veterans Supported Housing study to determine if imputation methods would improve the examination of the study intervention and its effects on substance abuse and psychiatric outcomes. Reanalysis was necessary because many participants missed schedule follow-up assessment visits there was differential attrition by study group. The authors hypothesized that the VASH intervention would have a positive effect on clinical and substance abuse outcomes which would become evident using multiple imputation methods. They examined 272 experimental and 188 control participants participating in 4 cities across the country and examined 36 month outcomes. The primary housing outcome was nights housed in the past 90 days. The secondary housing outcome was nights in an institution. The authors also used the Addiction Severity Index, the Lehman Quality of Life Scale, and a social support scale. The authors confirmed the results of the original study and analysis suggesting that the VASH intervention (VA supported housing-intensive case management plus Section 8 vouchers) was superior to the intensive case management services and the services as usual (short term case management) in affecting number of days housed. The VASH group also experienced fewer days intoxicated, fewer days using drugs, fewer days in an institution, better drug and alcohol index (severity) scores. The VASH group did not significantly improve in terms of the psychiatric index score. The reanalysis of the data yielded similar conclusions to the original analysis regarding the effectiveness of the intensive case management (the second condition) in that there were no statistically significant advantages over standard VA care in housing, psychiatric, substance abuse, or community adjustment outcomes. Overall quality of life was improved for the participants in the VASH intervention; however, the difference between the VASH and the services-as-usual group was not significant.

Experimental Designs in Studies without a Direct Housing Intervention.
Housing Stability

Kenny et al. (2004) investigated the effectiveness of assertive community treatment versus brokered case management in improving housing outcomes and reducing psychiatric symptoms. The study was conducted with individuals who were homeless or at risk for homelessness and had a severe mental illness. Individuals were recruited from emergency rooms and inpatient units and followed for a period of 24 months. The study appears to have taken place in St. Louis, Missouri.

The authors hypothesized that: 1) diagnosis would be negatively related to stable housing and would be a moderator of stable housing; 2) service variables (level of housing assistance, financial assistance, supportive services and counseling services) would mediate housing outcomes; 3) two service utilization variables would mediate changes in psychiatric symptoms (frequency of contact with assigned program and counseling services). Participants in the experimental condition (n=105) received Assertive Community Treatment (ACT). Most teams carried only 10-15 clients and provided most services directly in the client's residence or other community location. ACT provided 24 hour coverage for emergency services. Consistent with the ACT model, staff was organized in teams and shared responsibility for clients. They also provided supportive and recreational services sometimes through paraprofessionals. The control condition received brokered case management (BCM; n=60) a type of case management in which case managers typically have 50-100 clients and are primarily office-based. They provide few services directly but refer clients to other providers.

Interviewers collected information about housing stability (number of days respondents reported living in their own apartments, boarding homes or permanently staying with family and friends); psychiatric symptoms were measured by the Brief Psychiatric Rating Scale. Medication adherence was also assessed via self-report.

Those receiving ACT when compared to BCM improved in days housed (20.96 versus 14.93) during the prior month. Housing history and previous criminal arrest were associated with housing outcomes. ACT was more effective than BCM in reducing psychiatric symptoms and improving housing status. Assistance provided by case managers in locating housing and obtaining financial assistance were important mediators of the housing outcome. They found no significant mediators to explain how ACT reduced symptoms. None of the demographic or diagnostic variables studied moderated either housing or psychiatric symptoms. Whereas case managers can quickly affect housing situation, changes in psychiatric symptoms take longer and are very incremental. Medication adherence was important in reducing psychiatric symptoms.

Homeless or at-risk for being homeless patients were randomly assigned to receive one of 3 types of case management services upon discharge from hospital—ACT, ACT with community workers or brokered case management (BCM). The Assertive Community Treatment (ACT) condition provided intensive, individualized treatment in which the ACT team was responsible for providing or coordinating all services, there was persistent follow-up and in vivo service delivery; outreach and engagement services. Staff also
prioritized service activities that would help clients obtain and maintain housing. The ACT team consisted of 5 to 7 persons who helped clients link with medication services, cope with symptoms, solve problems in daily living and learn community living skills. They also supported landlords in solving client's housing problems, tracked applications for housing and benefits and advocated on behalf of the client with other agencies. Staff-to-client ratio was 1 to 10. In the second experimental condition, participants received ACT with community workers. This included the same interventions as above, except that clients were also assigned a paraprofessional community worker whose role it was to assist with activities of daily living and/or leisure activities.

The control condition was brokered case management in which the case manager created an individualized treatment plan, arranged for mental health and psychosocial services from various providers, monitored the quality of the services provided, and adjusted services as needed. They rarely did outreach or engagement and rarely made home visits or accompanied their clients on potential housing visits. Staff to client ratio was 1 to 85. Clients in ACT only (without community workers) showed greater housing stability at follow-up than the ACT with community workers and the brokered case management group (Morse et al., 1997). The follow-up period was 18 months and 165 individuals were randomly assigned a total of 135 were available at follow-up with no indication of differential attrition at follow-up. At the 18 month follow-up the number of days stably housed in the past 30 was 13.89, 23.70 and 16.02 for the ACT team with community workers, the ACT team only and the BCM group respectively. The ACT team only had significantly more days stably housed. Clients in the ACT groups were also more satisfied, less likely to drop out of the study, had more contact with their caseworker and had fewer psychiatric symptoms at 18 months than clients in the brokered case management group. No difference was found on housing stability. The 3 types of case management were not significantly different in overall cost, but the ACT groups saw less inpatient hospitalization costs than the brokered case management. (Wolff et al., 1997).

In a similar study of ACT case management, Lehman and colleagues (Lehman, Dixon, Kernan, DeForge, & Postrado, 1997) randomly assigned homeless individuals with a severe mental illness to ACT integrated, intensive case management (N=75) or “usual services” as the comparison condition (N=77). They found that participants in the ACT condition spent more days in stable community housing over the follow-up year than the “usual services” comparison condition (Lehman et al., 1997). ACT participants spent significantly more days in stable community housing than the comparison condition (210.2 days versus 160.1 days out of 365 days in the follow-up year). In addition, ACT participants accumulated significantly fewer psychiatric inpatient days (35.4 versus 66.9) and fewer emergency department visits, but used more outpatient mental health visits than the control group. No differences were found for general medical services or substance abuse treatment services. ACT participants were also more satisfied with their housing at the 6 month follow-up (but no differences were found at the other follow-up points).

In terms of clinical outcomes, ACT participants reported fewer symptoms at the 2, 6 and 12 month assessments (while no differences existed at baseline). ACT participants
reported better self-rated health status at the 2 and 6 month follow-ups, but not at the 1 year. Both groups improved significantly over the follow-up period in quality of life outcomes. In only one comparison did the ACT participants report more life satisfaction than the control group. The comparison group may have suffered "contamination" from another competing ACT program introduced in the area during the study, housing options were enhanced for both experimental and control groups which is not equivalent to what is typically available. The study also took place in one city (Baltimore) which compromises its generalizability.

Morse et al. (2006) conducted an experimental study to compare the costs and outcomes (satisfaction with treatment, stable housing, improvement in psychiatric symptoms and improvement on substance use measures) associated with three different treatment programs. Homeless individuals with co-occurring severe mental illness and substance use disorders were targeted for the interventions. Integrated Assertive Community Treatment (IACT; n=100) and Assertive Community Treatment Only (ACTO) were the experimental conditions (total n of the two conditions=100) and programs at community mental health agencies in St Louis were the control (N=49). They hypothesized that IACT and ACTO clients would show more improvement on days in stable housing, psychiatric symptoms, substance abuse measures and satisfaction with treatment than the control (services as usual) clients. Participants assigned to the control condition were shown a list of community agencies that provided mental health and substance abuse treatment so that they could seek services if they wished.

They found that clients in the IACT and ACTO (experimental) programs reported more days in stable housing and were more satisfied with their treatment program than clients in the control condition (18.29, 17.78 and 12.5 days of stable housing out of 30) for IACT, ACT only and the control condition respectively. There were no significant differences between groups on psychiatric symptoms or substance use. The average total costs associated with the IACT and control conditions were significantly less than the average total costs for the ACTO condition.

In terms of study limitations, the authors describe treatment implementation problems, treatment drift, attrition, and concerns about generalizability to other samples. Unfortunately, the authors provided little information about each of treatment program or how long they lasted. In addition, the control group was a very passive condition with no explicit services rendered.

In a small, but well-controlled study of homeless men (48 experimental and 48 control participants), Susser et al. (1997) investigated a “critical time intervention” designed to eliminate homelessness among New York City dwellers. The critical time intervention was designed to help men transition by strengthening the individual’s long-term ties to services, family and friends and to provide both emotional and practical support during the transition to residential stability. The intervention group did better in terms of nights homeless during the follow-up period of 18 months: the experimental group had an average 30 nights homeless in the 18 month follow-up period while the control group had 91. The chances of retaining housing were better in the experimental group and the risk
associated with extended homelessness was less in the experimental group. There was no difference between the experimental and control groups in terms of intermediate and transient homelessness.

- Fletcher, Cunningham, Calsyn, Morse, and Klinkenberg (2008) conducted a clinical trial comparing the effectiveness of assertive community treatment (ACT), integrated assertive community treatment (IACT) vs. standard care in the treatment of individuals who were dually diagnosed with a substance abuse problem and mental illness. They found that clients in both ACT and IACT (n=165) increased their days in stable housing more than clients receiving standard care (n=65) but there was no difference in the two ACT conditions. Most clients improved over time on the dependent variables (housing stability, substance abuse, psychiatric symptoms, and satisfaction in all three treatment conditions) and much of that change occurred in the first 6-12 months of treatment. In terms of stable housing all three groups had approximately 3 days of stable housing at the beginning of the study (out of 30 days) while at the 30 month follow-up average days in stable housing were 13.55, 15.99 and 11.81 for the ACT, IACT and standard care, respectively. Thus, there was a statistically significant difference between the treatment group and control groups in stable housing. Regardless of treatment condition, all the service variables had direct positive effects on one or more of the outcome variables when controlling for the intervention effects suggesting that service specificity, intensity and continuous services are all important, but the best service mix is different for each outcome variable. None of the service activities had an effect on substance abuse outcomes. Clients in both of the ACT conditions reported greater satisfaction with their intervention than those receiving standard care. They did find a significant number of clients whose permanent housing situation was not helped by ACT or standard care. Surprisingly, there were no differences between ACT and IACT in satisfaction or stable housing. There were no significant main effects of treatment on psychiatric symptoms or substance abuse. The authors conclude from this and previous research that ACT is not a particularly strong intervention in affecting substance use and psychiatric symptoms. The amount of missing data and the way that missing data were treated in the analyses could have compromised the findings and interpretation as there was a significant amount of dropout and no imputation.

**Quasi-Experimental Design Studies**

Reviewed in this category were studies with a quasi-experimental design (no random assignment but a reasonably constructed comparison group) and a supported or supportive housing intervention or an intervention designed to affect housing, but that did not explicitly include a housing intervention (such as intensive case management) but that were designed to affect housing directly. In addition, several large multi-site studies were the object of more than one study (for example, the large-scale ACCESS study).

**Housing Stability and Other Outcomes**

- Early research in supported housing models did not often involve random assignment to condition. Tsemberis (1999) was among the first to systematically study supported
housing in comparison to the linear residential model. Tsemberis examined program effectiveness of the Pathways to Housing model (n=139), a supported housing program and compared it in a quasi-experimental design to 2,864 individuals receiving residential “services as usual” or the linear residential model. The major research question was about feasibility: can individuals who have psychiatric disabilities move into an apartment directly from streets? How does the retention rate compare from Pathways to the linear model? Pathways supported housing is designed to serve individuals who are mentally ill, homeless and substance abusing and to offer them choice in housing as well as additional services. Housing is independent and scattered throughout New York City; individuals enjoy full rights of tenancy. No additional treatment is required to keep housing; clients do not have to be sober and have choice about whether they take psychiatric medications. The model uses a “harm reduction approach” to substance use, that is, interventions are designed to reduce harm or risk of harm associated with addiction. Housing and treatment are separate in this model and support is available in the community 24 hours a day, seven days a week. Services are individualized and consumer participation is emphasized. They found that housing stabilization rate (the ability to remain housed continuously in independent housing) for the Pathways supported housing program was 84% over 2 years, compared to 60% within the comparison group (employing a linear residential model). The sample resided in their apartments on average 30 months (Tsemberis, 1999). Tenants preferred the supported housing over the community residences. The major limitation of the study is the quasi-experimental nature of the study and the treatment in the analyses of drop-outs.

In a similar study, Tsemberis and Eisenberg (2000) followed 241 street-dwelling homeless individuals with psychiatric disabilities assigned to a supported housing program with strong adherence to supported housing principles. The two main questions they addressed were: 1) can homeless individuals with psychiatric disabilities or substance addictions successfully obtain and maintain an independent apartment without prior treatment? 2) do housing programs that require clients to participate in psychiatric treatment and maintain sobriety have a greater retention rate than a program that offers clients access to independent living without requiring treatment? The supported housing condition was “Pathways to Housing”, a nonprofit agency providing immediate housing to homeless individuals with mental illness and substance addiction disorders. Tenants choose the apartment from available listings with 70% of the cost subsidized by the program. Mental health, physical health, substance abuse, vocational and other services are provided by program staff using the Assertiveness Community Treatment (ACT) model in which half of the ACT team staff are consumers. Clients determine the type and intensity of services or may refuse them entirely. A harm reduction approach is taken to drug use. There are only 2 requirements: tenants must meet with staff at least twice a month and participate in a money management plan. They compared these individuals to 1,600 service recipients using administrative records. Individuals in the comparison condition received services using a linear residential treatment model in New York City's service system. This included a variety of congregate living facilities such as group homes, community residences and single-room occupancy residences, all with on-site services. To be admitted to the program, a client must have agreed to participate in psychiatric and substance abuse treatment and must maintain sobriety to keep housing.
They followed clients for 4.5 years and found that individuals in the supported housing condition achieved longer housing tenure than those in the comparison condition who received the linear residential treatment model. A total of 88% were stably housed after 5 years in the supported housing group when compared to 47% of those in the comparison condition (Tsemberis & Eisenberg, 2000). This study employed a quasi-experimental design which did not involve random assignment to condition, a limitation of the study. Attrition from the research was also a limitation.

Siegel et al. (2006) conducted a study of supported housing in New York City in which random assignment was not possible, but sophisticated statistical methods (employing propensity scores) were used to construct comparison groups. They followed 75 experimental participants who received supported housing to 82 individuals who received housing in community residences. In the experimental condition the two models of supported housing included: 1) tenants resided in apartments throughout the city, sobriety and treatment were not preconditions for housing; Assertive Community Treatment teams met with clients at least once per week providing medication/money management, and support services. Recreational programs (e.g., art) were available at a central location; and 2) tenants lived in an apartment within a renovated hotel of which 30% are occupied by people with severe mental illness; were 6 months clean/sober for admittance. In this second condition on-site crises services, case managers, and other training/support were continuously available. In both models tenants paid 30% of their income toward rent and were responsible for their meals and utilities.

In the comparison condition, individuals participated in a community residence program. They live in places only for persons with severe mental illness, have shared or single rooms with a common dining, meeting, and services area. Tenants were required to use a meal plan and each tenant was assigned a case manager. Sobriety was closely monitored; housing staff were available around the clock, and recreational activities were available at the site. In this condition, tenants turned all income over to the program who then dispensed an agency-specified personal needs allowance.

Analyses were complex. The authors created strata using a propensity score methodology to facilitate comparison of outcomes since random assignment was not possible. Results suggested that study participants were more likely to remain in their housing if they were initially placed in the supported housing rather than the community residence program. Tenants also preferred the supported housing over the community residences. However, at the 18 months follow-up, supported housing tenants reported more feelings of isolation than those in community residences. Overall, the estimated percentage of tenants still in their initial housing placement at 12 months ranged among the three strata from 72 to 87 percent for supported housing and from 62 to 71 percent for community residences. At 18 months, the range was 64 to 80 percent for supported housing and 37 to 71 percent for community residences.

Clark and Rich (2003) compared individuals who were homeless and mentally ill and received a comprehensive housing program (which included case management, access to
housing and housing support services; n=83) to a group receiving only case management services (n=69) on measures of housing, mental health symptoms, substance use, physical health and quality of life. Individuals were followed for one year as they entered one of three programs (2 experimental and 1 control) over a 2 year period. Individuals were homeless or at immediate risk of homelessness and had a mental illness. Agencies provided services under a similar program model which featured guaranteed access to housing and housing support services, case management and priority access to everything from medication management to vocational rehabilitation. A separate agency provided homeless outreach and support team provided short-term case management which included some counseling, medication and medication management, assistance with obtaining housing and linkages to other services. The effectiveness of the comprehensive versus case management only programs were compared in terms of housing, mental health and physical health.

Individuals with high impairment (more symptoms, more periods of being homeless) who received case management only showed poorer outcomes in terms of stable housing and homelessness relative to the high impairment participants receiving the comprehensive housing intervention. Participants in the low and medium impairment groups did just as well on housing measures whether they were in the control or experimental group. Analyses of psychiatric symptoms and alcohol/drug use showed improvement over time overall, but no differences between treatment groups.

The study had some limitations given its quasi-experimental nature in that there were differences in groups at baseline in terms of number of times previously homeless (the control group had a greater number) as well as more impairment in psychiatric symptoms and days of alcohol/drug use. The control group also had a much higher rate of attrition. The results of the study have limited generalizability as the sample is mostly white.

・ The effectiveness of a therapeutic community-oriented supported housing approach was studied by Sacks, De Leon, Sacks, McKendrick, and Brown (2003). The purpose of this study was to compare a therapeutic community-oriented supported housing intervention (n=81) to no intervention for individuals with mental illness and substance abuse problems who had just completed a 12-month therapeutic community stay (n=34). Their rationale for conducting this study is that many studies of supported housing do not focus on changes in substance use behavior or in psycho-social and vocational functioning.

All clients of this study had completed a therapeutic community (TC) stay that usually involved 12 months of treatment. The experimental subjects were those who opted for a TC-oriented housing program at the end of the TC stay; there was no random assignment. The supported housing program was intended to facilitate the transition to independent living. Participants were housed in 1 or 2 bedroom units in clustered locations in Brooklyn. Staff were on site (but not in the apartments) and counselors conducted counseling, relapse prevention groups, psychoeducational classes, and coordinated other services. On site services included an array of social services including group and individual counseling, and peer self-help groups. Some clients were in day treatment
programs and clients were eligible for assistance with vocational activities (including peer run work groups, vocational assessment and counseling).

The comparison clients had also completed a therapeutic community stay of about 12 months. They then had the opportunity to take advantage of an array of housing options including SROs, supported apartments, or other independent living arrangements either alone or with family and friends. They were offered substance abuse services-as-usual and were encouraged to attend AA/NA.

Extensive measures of substance abuse, criminality, HIV-risk behavior, psychological dysfunction and prosocial behavior were collected resulting in 14 outcome measures. Most measures seem to be developed for the study except for the Beck Depression Inventory, the Anxiety measure and the symptom measure (SCL-90).

The authors conclude that there were significant differences between participants receiving the supported housing intervention, and those not in terms of substance use, crime, and prosocial factors such as frequency of attending AA meetings). There were no differences between the groups on a measure of depression, anxiety, or psychological symptoms. There were reductions in negative or antisocial behaviors among those in the supported housing option. The authors also assert that there were gains from treatment in terms of increases in employment and reductions in psychological symptoms during receipt of supported housing. They found a retention rate of 83%—that is, of the 81 placed in supported housing, 67 completed a 6 month stay.

Limitations include the fact that there was no random assignment and that participants could opt for the supported housing or not. This could have created selection factors that are responsible for the differences seen. The two groups were different at baseline in education, primary substance abuse problem and intelligence quotient. In addition, there was substantial attrition that the authors do not address in the analyses or in their conclusions.

In a quasi-experimental design studying 54 continuing care clients with a psychiatric disability in a psycho-geriatric hospital discharged to nursing homes in the community compared with a sample of 36 being discharged from the hospital to the community, Cooper and Pearce (1996) conducted an evaluation of outcomes. Experimental clients received residential services which focused on supported accommodations in a “homelike” environment compared to community based nursing homes. They found that relocation did not result in trauma, behavioral regression or withdrawal as feared by service providers. Individuals placed in community supported residential facilities did not deteriorate (an initial concern), reported being happier and less depressed in the community but did not improve in terms of Activities of Daily Living (ADL) or social contacts. Nursing home clients did not experience any improvements.

Cost Studies Using Quasi-Experimental Designs with Housing Intervention
Culhane, Metraux, and Hadley (2001; 2002) conducted a study of supported housing in New York City with the purpose of examining the costs and cost offsets of supportive housing and community residences in New York City for individuals who were homeless and mentally ill.

The intervention under study was supportive housing, including scattered-site housing with community-based service supports and single room occupancy housing. The second comprised Community Residence facilities, long-term treatment facilities, and adult homes. This was a quasi-experimental research design in which comparison groups were established on a case-control basis. That is, for each analysis a control group was constructed using matching procedures from administrative datasets. So, for example, of the 4,679 experimental "cases" (those receiving supportive housing during the study time frame) 3,338 had been in shelters in the two years prior to the analyses. A total of 3,338 controls were found to match the experimental cases that were placed in to housing for the analyses. Similar comparison groups were formed for each analysis including inpatient hospitalizations, shelters, outpatient mental health services, VA hospital use, and jails. A different cohort was used each time based on their use of the targeted service. The authors used 2 years of pre data and 2 years of post data (after housing placement for the experimental subjects). Authors tracked costs across multiple service systems (i.e., health, mental health, corrections) using key identifiers to insure they were matching on the correct subjects which is rarely done in cost studies. This allowed them to get a more accurate reading of costs and cost offsets.

Results suggested that when compared to case controls, placement in housing resulted in significant reductions in homelessness and in service use particularly in terms of shelters, hospitals and correctional facilities. The total mean cost of service use prior to housing placement was $40,449 per year per person, with the bulk of those expenditures being in health services and shelter use. Placement in housing resulted in a $12,145 net reduction in health, corrections, and shelter service use annually per person over the two years post receipt of housing. Annualized cost per placement in housing was $13,570 and $12,889 for the supportive housing units, respectively. Thus, the net cost per placement in supported housing was $744 (deducting the savings). Slightly different figures, but with the same trend, were found when looking at per unit (as opposed to per placement) costs. It is clear that housing placement is effective in achieving housing stability and providing offsetting reductions in collateral service use. The authors also found other significant predictors of service use including pre levels of use, diagnosis, age, gender, and race. This study did not include all direct or indirect costs associated with service use by homeless people including outreach services, soup kitchens, drop-in centers, etc. The study was not experimental and therefore has limitations related to relying post hoc on constructed matched control groups. In addition, administrative data could be inaccurate. A selection effect could also not be ruled out such that those placed in housing are different than the homeless population in general.

In a related study using the same data but focusing on different analyses, Culhane and his colleagues found that individuals placed in housing showed an 86% decrease in number
of days in a shelter from the pre to post time periods, compared to a 6% decline in days housed in a shelter among the comparison group.

Culhane and colleagues found the following changes in service use among those receiving supportive housing: 1) the percentage hospitalized in a state hospital and the number of days hospitalized declined significantly in the experimental group but not in the comparison group; 2) the percentage of those in supportive housing hospitalized and the average days hospitalized in public hospitals declined more in the pre/post period than in the control group; 3) there was a $5,467 reduction of Medicaid-reimbursed costs for those receiving supportive housing; 4) the total number of Medicaid-reimbursed outpatient visits and associated costs increased pre/post and at a higher rate than the comparison group; 5) participants receiving supportive housing averaged 47 visits more post-housing and $3,843 more in costs; 6) the intervention group showed a decrease in the proportion of participants incarcerated from pre/post and a decreased number of days incarcerated, while the comparison group did not decrease in either indicator.

Overall, those placed in NY/NY housing showed a decrease in total service costs from $40,451 per year to $28,305. A full 95% of the reductions are associated with medical care (72%), with shelter usage accounting for 23% of the reduction and incarceration services accounting for 5%.

Total savings in service costs among the New York City group relative to the cost of providing the housing service yielded a net cost of $1,908. The supported housing facilities were more cost effective than the more traditional community residences, offsetting 95% of their costs in the reductions of service usages.

The ACCESS program provided $250,000 and technical assistance to implement strategies to promote systems integration across nine sites over four years and to provide these sites as well as nine comparison sites with the funds to provide ACT programs to assist 100 clients per year in this analysis of 5,471 study participants. No differences were found between experimental and comparison sites on housing status (Rosenheck et al., 2002). Degree of implementation of integration strategies was also not related to housing status. Clients in agencies that became more integrated over the study (improved their interorganizational relationships) observed a greater improvement in housing status than clients within agencies that did not observe an improvement in interorganizational relationships. Agencies that achieved greater project-centered integration also had improved housing outcomes among their clients than within agencies that did not observe improvement in project-centered integration.

Quasi-Experimental Studies with no Direct Housing Intervention.

As part of the ACCESS study, Rosenheck examined outcomes after one year of receiving services (Mares & Rosenheck, 2004). The ACCESS study was a major initiative of the Substance Abuse and Mental Health Services Administration and was targeted at improving systems and services integration nationally so that outcomes for homeless individuals with mental illnesses and substance abuse services could receive better
services. They found that one year after entering services (case management), 37% of formerly homeless individuals with Severe Mental Illness (SMI) were stably and independently housed and showed the greatest clinical improvement and had more access to housing services. Clients who were housed were also more satisfied with their lives than homeless individuals. Unfortunately, 26% of individuals they were following were lost to follow-up compromising their conclusions.

**Conclusions from the Systematic Review: Experimental and Quasi-Experimental Design Studies**

Conclusions from the experimental and quasi-experimental studies are quite robust and reliable given the designs employed. The findings suggest that:

*Housing and residential outcomes*

- There is robust evidence from both randomized trials and quasi-experimental studies that supported housing interventions of various types can significantly improve residential status among individuals who are psychiatrically disabled (Tsemberis et al., 2004; Gulcur et al., 2003; Shern et al., 1997; Rosenheck et al., 2003; Goldfinger et al., 1999; Morse et al., 2006).

- Supported housing interventions of various types have also been demonstrated to significantly improve residential status for individuals who are homeless or at risk for homelessness and substance abusing (Gulcur et al. 2003).

- Housing stability rates close to or exceeding of 80% or more can be achieved with a supported housing approach (Goldfinger et al., 1999), meaning that individuals are housed 80% of the time for the follow-up period. While not all studies achieved this level of housing stability, (66% was seen in a large study of veterans), more than one controlled study achieved this rate.

- The Housing First model (NYC-Tsemberis) is the only model to achieve over 80% housing retention rate over a several year period.

- The longer the follow-up period, the greater the decline in housing retention rates, as might be expected.

- Supported housing models did not always fare better in terms housing retention rates than “continuum of care” approaches, (e.g. McHugo et al., 2004) but did fare better consistently than services-as-usual.

- Those studies that demonstrated a decline in housing retention over time (including the VASH study and the Philadelphia study) both seemed to suffer from the same problem: lack of consistent and intensive case management for a large percentage of their study cohort. Intensive case management is needed to maximize housing retention and stability among this population.
Services provided using the ACT model leads to improvement in housing outcomes (Kenny et al., 2004).

Cost Issues and Service Utilization

- Housing subsidies or vouchers and housing affordability lead to more success in getting and keeping individuals housed (Hurlburt, Wood, & Hough, 1996).
- Having a case manager directly assist with obtaining financial support for housing was an important mediator of positive housing outcomes (Kenny et al., 2004).
- Provision of housing services reduces service utilization and other service-related costs (Culhane, et al., 2002).
- Supported housing approaches are probably more costly (Rosenheck et al., 2003) in terms of residential service delivery, but the cost offsets may make the cost benefit equation more palatable when comparing SH to other options (Culhane et al., 2002). (Note: one study of supported housing compared to group homes reviewed in the next section found supported housing to be less expensive, Jarbrink, Hallam and Knapp, 2001; however, the study had many methodological limitations.)
- Studies show a reduction in hospitalization use while individuals were housed (Lipton et al., 1988; Culhane et al., 2002).

Other Conclusions

- There is some evidence that woman and older individuals fare better than men in supported housing interventions. There is some indication that African Americans fare worse in housing outcomes (Goldfinger et al., 1999; McHugo et al., 2004).
- Practical services (help with laundry, shopping, etc) are needed in supported housing interventions.
- Regular case management is no more effective than services as usual (Rosenheck et al., 2003) in terms of keeping individuals housed—intensive services and supports are needed for this population (Clark & Rich, 2003).
- ACT case management in the context of a supported housing intervention lead to greater satisfaction, greater contact with service providers, reduced symptoms, and greater stability in the community (Morse et al., 1997; Fletcher et al., 2008).
- Service integration affects housing outcomes (Rosenheck et al., 2002).
Housing outcomes appear to be easier to affect than clinical outcomes (Rosenheck et al., 2003; Morse et al., 2006; Fletcher et al., 2008); however, some studied suggest improvements in symptoms (Kenny et al., 2004).

Recent re-analyses of older data suggests that substance abuse and psychiatric symptoms outcomes may be positively affected by the supported housing outcome (Cheng et al., 2008; Kenny et al., 2004). These results may speak to the need for specificity of the intervention on the targeted outcomes (clinical interventions for symptoms; housing interventions and supports for housing stability).

Individuals receiving supported housing perceive more choice (Tsemberis et al., 2004).

At least one study suggested that there was no difference in quality of life between those in supported housing and those receiving services as usual (Cheng et al., 2007). However, a large VA study suggested higher quality of life among those in supported housing (O’Connell et al., 2008).

Participants prefer independent housing and expressed more satisfaction with it (Lipton et al., 1988; Schutt et al., 1997; Tsemberis, 1999).

Correlates of Success in Supported Housing

The role of psychiatric diagnosis is equivocal in supported housing with some studies suggesting that diagnosis is not a factor in residential stability (Rosenheck et al., 2003) and some suggesting that it is (Hurlburt, Wood, & Hough, 1996).

Substance abuse at study entry is a predictor of poorer housing outcomes (O’Connell, 2008).

The role of demographic characteristics in housing outcomes is equivocal. There is some evidence that woman and older individuals fare better than men in supported housing interventions. There is some indication that African Americans fare worse in housing outcomes. Some studies have not found any demographic predictors of outcome (Kenny et al., 2004).

Housing history and previous criminal arrests are associated with relatively poorer outcomes (Kenny et al., 2004).

Conclusions from the Systematic Review: Methodological Conclusions

Studying residential options with a randomized design is feasible, though attrition of study participants is a challenge in these designs.

A consensus on the primary (and secondary) outcomes of supported housing, particularly in the area of residential stability would be very helpful for the field.
Currently research studies use terms such as residential tenure, residential stability, residential consistency, time to first failure, days in hospitals or shelters, and differing lengths of time for the follow-up period. These differences make it difficult to compare studied and conduct meta-analyses.

- Operational measurement of supported housing interventions would also be helpful as it is difficult often to determine whether interventions described are in fact supportive or supported housing. This type of consensus and operational measurement would also advance the field by making the interventions comparable and therefore facilitating meta-analyses.

- The literature and statistical methods have evolved during the 15 years included in this review. Statistical methods became more complex and sophisticated and somewhat more difficult for a lay person to grasp.

- Newer statistical methods (e.g., imputation) are being used to handle missing data which is an enormous limitation in existing research.

**Results of the Systematic Review: Correlational Studies**

*Effectiveness of Specific Factors of Intervention*

**Residential Stability as Outcome**

- Mares, Kasprow, and Rosenheck (2004) examined the program level features of a supportive housing intervention that were associated with housing tenure two years after placement into housing. Using a sample of 655 homeless veterans participating in the ACCESS study (a supported housing effectiveness study examining a program with moderate adherence to supported housing principles), they found that only 50% of those placed into supported housing were still housed there one year later and only 20% were still living there two years later. About half of the consumers who were discharged from the program left under mutually agreeable terms. Clients who received rental subsidies (26% of sample) as well as clients who had more intensive case management (42% of sample) were more likely to remain in the program. Clients with delayed entry into housing were more likely to terminate and had less likelihood of being independently housed. Those placed into more “normalized” commercial housing were more likely to terminate, but less likely to complete treatment. Receiving continued case management was also predictive of completing the program. This study found support for some principles of supported housing such as rapid entry into independent housing with supports, but mixed results were found for placing consumers into housing with commercial landlords.

- Wong, Poulin, Lee, Davis, and Hadley (2008) similarly examined the housing outcomes of participants in a supported housing program with moderate fidelity to supported housing principles called the Supported Independent Living program (SIL) in Philadelphia. Taking place in Philadelphia, SIL included scattered site and clustered
residential units and residential support teams providing housing supports to maintain independent living through skill development and by linking residents to community-based mental health services. The authors reported a one-year housing retention rate of 83.4% and a three-year retention rate of 59.6%. While 45% of the participants used public shelters prior to entering the program, only 3.1% had used shelters during their stay. Individuals placed in the cluster site apartments (those servicing all SIL residents within one single building or rental community) were more likely to leave with their whereabouts being unknown than those placed into scatter site apartments. These outcomes should be interpreted with caution because the sample was one of convenience and only included those willing to participate in the interview. Another limitation of this study was that there was a low usage of case management services—only 58% of the sample used case management, a factor that likely caused some residents to be insufficiently supported.

In a qualitative portion of Wong’s study, the authors were able to delve more deeply into the individual residents’ reasons for leaving the supported housing program. In half of all the leaving scenarios described in the qualitative interviews, issues around sobriety rules, residential rules or issues between residents and staff were mentioned as reasons for leaving.

- In a study of 2,798 homeless veterans who were provided supported housing services with high fidelity to supported housing principles and included intensive case management and assistance in applying for Section 8 housing, Kasprow, Rosenheck, Frisman and DiLella (2000) found that participants were more likely to attain an apartment if their case manager accompanied them to the public housing authority on more than one occasion. Of those obtaining housing, 84% remained housed one year later. Clients whose case managers assisted them in obtaining SSI were more likely to be housed, but clients whose case managers accompanied them on their first visit to the housing authority were less likely to be housed. Kasprow and his colleagues speculate that this “could mean that less capable veterans may obtain apartments with assistance of a case manager but may later have difficulty sustaining their housing.”

- Other researchers have examined how higher-order features of the entire service system in a particular location are related to consumers’ residential outcomes. Rosenheck et al. (1998) measured the level of integration and coordination between all agencies serving homeless persons with mental illness within the service system of each of the study’s 18 sites (in 9 states). They examined whether service system integration was related to clients’ accessibility of services and housing outcomes among 1,832 participants of the ACCESS study. They found that agencies with greater integration and coordination at baseline were associated with greater accessibility of housing services 3 months after program entry and to clients’ achievement of independent housing 12 months after entry into the program. Only 74% of the sample was used in the analyses at follow-up and the assessment service system integration is complex and untested; both of these factors present potential limitations to the research.

*Characteristics of Residents/Clients/Consumers*
Residential Stability as Outcome

- In addition to examining the program level features associated with housing tenure, Mares et al. (2004) also examined the client level features. Using largely administrative data from the 655 homeless veterans participating in the ACCESS study, they found that demographic and most service-use characteristics were not helpful in predicting housing tenure one and two years after being placed into housing. Prior residential treatment was a significant predictor—clients who received limited residential treatment (1-90 days) prior to entering supported housing were more likely than clients who did not receive any residential treatment to leave the program after treatment. This disconfirmed their primary hypotheses that clients who received residential treatment before entering supported housing would have better housing outcomes.

- Severity of illness similarly appears to be associated with poorer housing outcomes within a study of 452 participants in the Supported Independent Living program (SIL) in Philadelphia (Wong et al., 2008). The authors found that those receiving outpatient counseling were more likely to stay in the program, while residents who used acute or inpatient services were more likely to leave the program for a more dependent living situation. Wong et al. (2008) also found that older people and individuals diagnosed with schizophrenia were more likely to stay in SIL.

- In another study of 2,798 consumers examining personal characteristics that predict housing tenure, Kasprów et al. (2000) found women were more likely than men to remain stably housed for one year after being placed in a supported housing program that included case management and assistance with obtaining Section 8 vouchers.

Community Integration and Functioning, Satisfaction, and Quality of Life as Outcome

- In a cross-sectional study comparing in-patient hospital residents to residents of community residential settings with severe mental illness, Shepherd, Muijen, Dean, and Cooney (1996) found that residents of the community settings were more satisfied with their number of friends. Residents of the hospital wards were more disabled and had greater lengths of stay than community residents. They also found a significant negative correlation between the restrictiveness of the setting and global well-being. Total number of staff was not related to well-being.

Service Usage as Outcome

- Rosenheck and Lam (1997b) examined “predisposing” individual factors which predicted service usage within 1,828 participants of the ACCESS demonstration project from all 18 communities participating in the study. Client-level variables included demographic and illness-related factors, as well as whether clients entered the program through specialized outreach efforts, the duration of preadmission involvement with program staff, and the site at which entry took place. Service use included 23 types of
services, encompassing both mental health and general health services. Their results showed that personal characteristics only accounted for 2% of variance in intensity of mental health service use and 7% of core service use. Presence of depression and level of education was found to be positively associated with service use, while days intoxicated had a negative association with service use. A greater diversity of service use was associated with being African American, being more educated, having poor health, having a greater level of social support, experiencing more depressive symptoms, having a higher income and a longer duration of pre-entry involvement with service staff. Site of entry into the study predicted several times more variance in service use than the amount of variance explained by client characteristics and illness. The authors were unable to pinpoint which specific feature(s) of the 18 service systems involved in this study (e.g. funding for services, types of services available, clients’ proximity to services, etc.) were driving this effect, but it was clear that variations in the service systems were much more important than individual characteristics in predicting service usage (Rosenheck & Lam, 1997b).

Casper and Clark (2004) examined the role of incarceration history on service usage among 56 homeless residents of a transitional residence program. The program provided on-site case management services to assist consumers in securing permanent housing of their choice, but this study did not explicitly examine program effectiveness. Within this transitional residence program with low adherence to supported housing principles, consumers with a history of incarceration utilized more services and were more likely to be associated with 911 calls during their first year of residence than matched controls who did not have a history of incarceration. This effect remained significant even taking into account substance abuse history.

In another study examining personal characteristics of supportive housing consumers, Pollio, Spitznagel, North, Thompson and Foster (2000) compared a matched sample of homeless consumers receiving services from a multiservice agency who were either successful (N=58) or unsuccessful (N=55) in securing stable housing for at least 24 months. Individuals who were able to obtain stable housing and maintain it for 24 months showed a distinct increase in usage of drop-in services and counseling around the time of their housing obtainment, but then displayed a sharp decline in these services for the remainder of the follow-up period. The comparison sample, consisting of individuals receiving services at the agency during the same time period but who did not obtain housing, did not show these same trends in service usage over time; rather, the comparison sample showed a consistent decline in level of services used over the follow-up period. The authors conclude that this study lends support to the importance of providing multiple services including counseling and drop-in services when implementing a housing program. Additionally, it lends support to the supported housing concept of flexibility in services and matching the level of services to the individual need of the client—specifically, they propose a model with low-level of supports initially while relationships are established, building up the level of services around the time of the transition to stable housing, then slowly tapering down supports after a successful transition.
Costs as Outcome

- Jarbrink et al. (2001) compared the costs of providing housing and services among 238 consumers living in three different types of housing arrangements in London. Of consumers’ personal characteristics studied, age and experience of psychosis predicted higher total costs. Consumers that lacked basic skills predicted lower costs, indicating that people who lacked basic numeracy and literacy skills received fewer services than other tenants with similar needs who did not lack these skills. The authors concluded that this finding highlights a disparity in the distribution of services between those with and without basic skills.

Housing/Community Features

Description of Accommodations

- The aforementioned study conducted by Jarbrink et al. (2001) also compared the physical attractiveness and suitability of accommodations within a sample of 238 consumers living among three different types of housing arrangements in London. The types of housing compared were “general housing” (independent housing with no supports), supported housing in an independent or shared living arrangement or a group home with on-site staff. Group homes were rated higher than both supported and general housing on 10 of the 11 categories of the physical attractiveness and suitability of the accommodation. Significant differences were found between housing types, with the one exception being "suitability for a person with disabilities," which was highest for the residents of general housing. Findings should be interpreted with caution because the authors were unable to determine the extent to which tenants had the opportunity to choose their own housing, nor were they able to assess the degree to which housing availability affected housing provision.

Residential Stability as Outcome

- In one of the few studies that looked at long term residential stability, Lipton, Siegel, Hannigan, Samuels and Baker (2000) studied outcomes for 2,937 individuals placed into low, moderate and high intensity housing. Outcomes were examined separately by intensity of housing whereby “intensity” was defined as the “amount of structure and degree of clients’ independence” available in the residence. They found that among those initially placed in low intensity housing, 54% were still stably housed 5 years later; among those in moderate intensity sites, 56% were stably housed 5 years later while 37% of high intensity tenants were still housed there after 5 years. These differences are likely in part due to individual differences in the groups at the time residents were referred—those in the high intensity housing were more likely to have substance abuse and/or a diagnosis of schizophrenia, while residents in the low intensity housing were more likely to have lived in a shelter for more than four months before program entry. Lipton and colleagues (Lipton et al., 2000) also found that the likelihood of becoming discontinuously housed was greatest in the first 4 months of placement within high intensity settings.
Lipton et al. (2000) also examined which housing features within each level of “intensity” were associated with longer housing tenure. Among “high intensity” settings (housing that was transitional, usually congregate, and with high staffing and restrictions), those that were congregate and did not provide medication management were associated with shorter tenures. Among “moderate intensity” units (permanent housing that provided individual rooms or apartments exclusively to individuals with mental illness, had 24 hour staff coverage and fairly intensive but not usually mandatory services provided), shorter tenancy was associated with sites that granted occupancy agreements and allowed overnight guests. Among low intensity settings (single apartments in mixed-tenancy buildings or hotel-like buildings, where services are provided on or off-site and the large majority of sites did not require service participation), tenure was shorter in less "normalized" units composed of single rooms, suites or shared apartments.

In another study of the relationship between housing stability and housing features, Harkness, Newman and Salkever (2004) studied housing features (e.g. number of units in building, average size of the units in the building, building age and repair needs), tenant composition features (e.g. percentage of building tenants diagnosed with a severe mental illness and the average GAF of the tenants with a mental illness in the building) and neighborhood features (e.g. poverty rate, percentage of houses built before 1940, number of nonresidential land uses on the block) among a sample of 670 individuals across 4 US cities. They found that mental health consumers living in a building with fewer units and with a greater proportion of residents with a chronic mental illness were more likely to remain stably housed (Harkness et al., 2004). They speculated this may be because “individuals with CMI may feel more comfortable and secure living in smaller-scale residential settings with others like themselves.” They also found that mental health consumers living in newer and properly maintained buildings had lower residential instability.

Community Integration and Functioning

Yanos, Felton, Tsemberis, and Frye (2007) broadened the exploration of supported housing features related to consumer’s outcomes to include the examination of community-level features that predict social functioning, community integration and neighborhood social cohesion. Among a sample of 44 homeless individuals who were part of a larger supportive housing study, they found that residence in independent apartments (as compared to congregate living) was significantly associated with greater independence (defined as the ability to attend to personal and household responsibilities) and greater occupational functioning. Regarding neighborhood factors, perceived neighborhood social cohesion was strongly related to psychological integration, but not to functioning, physical or social integration. The population of immigrants in the neighborhood was negatively related to sense of community, suggesting that study participants felt particularly left out in these neighborhoods. Overall, neighborhood characteristics were only weakly related to community integration outcomes, likely due to low statistical power and the possibility of flawed measures of community integration.
Nelson, Hall, and Walsh-Bowers (1998) examined the relationship between residents’ independent functioning and residential features such as physical problems with the buildings, privacy, staffing, degree of resident control and democratic management. Within the 173 residents included of 29 various housing settings in Ontario (both independent and dependent), they found that housing “concerns” (the degree of physical comfort of the residence) and lack of private bedroom were related to negative affect one year later. Not having one’s own room was also associated with lower levels of independent functioning (as rated by the residents). Number of residents in the residence was inversely related to independent functioning. Residential control (involvement in residential decision-making) was related to independent functioning. These latter two findings seemed to be related in that residences with a greater number of residences also tended to be the residences that were more “institutional,” providing less control to residents in decision-making. Thus, providing residents their own bedroom in a residence that is physically comfortable and has fewer housing concerns appears to lead to better outcomes in terms of functioning and affect for individuals with serious mental illness.

Costs and Hospitalizations as Outcome

In Harkness et al., 2004 study of the housing features (e.g. number of units in building), tenant composition features (e.g. percentage of building with other individuals with a severe mental illness) and neighborhood features (e.g. poverty rate) relationship to tenant outcomes, they found that that mental health consumers (N=670) living in newer and properly maintained buildings had lower mental health care costs compared to those placed in older buildings in greater need of repair. Buildings with more amenity features (i.e. garbage disposal, air conditioning) and buildings in neighborhoods with fewer physical signs of deterioration (but not necessarily lower income areas) were associated with reduced mental health care costs. Mental health consumers living in neighborhoods with more nonresidential land uses experienced a reduced probability of mental health hospitalization. The authors found this to be consistent with Segal and Avirani’s theory where “diverse neighborhoods may have a more active street life and a more fluid population, allowing residents with chronic mental illness to remain anonymous and avoid stigmatization.” (Harkness et al., 2004).

A previously mentioned study conducted by Jarbrink et al. (2001) compared the housing and support costs within a sample of 238 consumers living among three different types of housing arrangements in London. The types of housing compared were “general housing” (independent housing with no supports), supported housing in an independent or shared living arrangement or a group home with on-site staff. Total costs for group home were much higher than for supported housing or general housing, although this is likely due to the supported housing clients’ higher levels of functioning, as evidenced by their higher rate of employment and younger age as compared to those in group homes. Housing costs alone (not including service costs) were also more expensive for group homes than supported housing residences; this difference seems less likely to be attributable to differences in the severity of disability among the residents as mortgage, staffing and living expenses would be less likely to be affected by the residents’ level of
functioning. These findings run counter to experimental studies conducted in the United States which show supported housing programs to be more expensive. The only characteristic of the living accommodation that was related to greater total cost was the building's suitability for use by people with disabilities. Findings should be interpreted with some caution as the authors were unable to determine how tenants were placed into their housing, nor were they able to ascertain the extent to which tenants had the opportunity to choose their own level of supports or housing type.

Description of Staff-Resident Interactions

Shepherd et al. (1996) conducted a cross-sectional study (1996) comparing long-term in-patient hospital residents (N=84) to residents of community residential settings (N=140) found that residents of hospital wards received fewer interactions with staff per day (4.9) than residents of the community residences (11.1). There was a non-significant trend for staff of hospitals to engage a greater percentage of neutral or negative interactions than staff in community residences. There was a significant correlation between the most severely disabled residents receiving more negative interactions with staff. The longer the staff member had been employed in the setting and the longer they had worked in the mental health care setting, the greater the number of negative client interactions were observed.

Consumer Choice

Characteristics of Residents/ Clients/ Consumers

Srebnik, Livingston, Gordon, and King (1995) report on 115 consumers’ perceptions of housing choice assessed during baseline interviews for a multi-site supported housing demonstration project that involved a housing component. Most of the consumers in the study had previously been living in congregate homes or institutions. Sites were required to help consumers considered to be the “most difficult to serve.” Analysis found that two-thirds of participants had only one housing option and 36% felt that their housing choice was highly or completely influenced by others (most commonly, by mental health professionals). However, 90% reported liking their option(s) and 82% felt they had enough information to make a good decision.

Residential Stability as Outcome

Consumers’ degree of choice in residential decisions was related to their reports one year later of their desire to stay in their current residence, their housing stability, and their belief that their needs were well matched by the supports available (Srebnik et al., 1995). Greater information was also related to desire to stay in current residence.

Satisfaction and Quality of Life as Outcome

More choice in housing decisions was correlated with consumers’ reports one year later for housing satisfaction, happiness and life satisfaction. Having more than one housing
option was correlated with consumers’ report one year later of happiness and life satisfaction (Srebnik et al., 1995).

**Psychiatric Symptoms as Outcome**

◦ A second correlational study of consumer choice examined its relationship to psychiatric symptoms within a sample of 197 homeless individuals who were participating in a larger intervention study on the effectiveness of supported housing that involved the provision of housing (Greenwood, Schaefer-McDaniel, Winkel, & Tsemberis, 2005). Participants experienced a decrease in psychiatric symptoms over the 30 month assessment period. The link between homelessness and psychiatric symptoms was partially mediated by choice. These links form a chain of relationships between structural and psychological factors that suggest that choice-driven models of service delivery may not only have a direct effect on reductions in homelessness, but may also have a distal effect on psychological outcomes such as reductions in psychiatric symptoms. Perceived choice significantly accounted for the decrease in symptoms and was partially mediated by mastery. Lack of personal control and choice was associated with the experience of symptoms.

**Housing Preferences**

**Characteristics of Residents/ Clients/ Consumers**

◦ A correlational conducted by Schutt and Goldfinger (1996) examined housing preferences within a sample of 118 homeless individuals waiting to receive housing as part of a larger effectiveness study of supported housing. This study investigated how demographic variables, clinical characteristics and perceptions of one’s health and functional state relate to preferences for housing. They found that participants expressed a strong preference for independent living; 87% preferred living in an apartment more than a large group home and 78% chose living in a small group home over a large group home. Most consumers (77%) were also interested in having staff assistance with things they had difficulty with. Being male was related to preference for traditional group home; and having a substance abuse diagnosis was negatively related to a preference for a traditional group home living situation. Consumers’ belief that they would be unable to manage the tasks associated with independent living was associated with a stronger preference for a traditional group home living situation. Higher levels of perceived social support were associated with stronger preferences for group home living (Schutt & Goldfinger, 1996).

**Residential Stability, Social Support and Quality of Life as Outcomes**

◦ In a study of housing preferences of 523 homeless veterans participating in the HUD-VASH study, O’Connell, Rosenheck, Kasprow, and Frisman (2006) studied consumer preferences for housing features being placed into housing, then reassessed whether the veterans received housing with these features 3 months after housing placement and examined whether the obtainment of preferred housing was related to tenure, social
support and quality of life. The authors found that obtaining housing with one’s preferred housing features was not associated with housing tenure. This null finding may have been due to the large number of individuals from the sample that were stably housed which weakened the statistical power to detect the impact of housing preferences on tenure. A significant relationship was found between obtaining preferred housing features and residents’ quality of life and social support. Little information is provided about the degree of attrition within the sample, which is likely to further limit the conclusions drawn from this study.

Another study exploring how housing preferences relate to quality of life examined the relationship between individuals’ current housing type and their housing preferences (Nelson, Hall, & Forchuk, 2003). Housing type was defined as one of four types—shelters, supportive housing, supported housing, or “specialized housing” (akin to a group home with 24-hour one-site staff). Thirty-eight percent of the 300 residents in the study were living in their preferred housing type, and those that were in their preferred housing type had much higher levels of quality of life than those not living in their preferred housing. Essentially none of the residents wanted to live in a shelter.

Concordance of Clinician Recommendations and Consumer Preferences for Housing

Two studies revealed wide discrepancies between the clients’ preferences and the clinicians’ recommendations for housing. Goldfinger and Schutt (1996) found that clinicians were much more likely to recommend a group living residence with more supervision than consumers were to choose this type of housing for themselves on a survey comparing housing preferences/recommendations between 118 consumers and their clinicians.

Similarly, Minsky, Riesser and Duffy (1995) compared the housing preferences of 80 patients in an inpatient psychiatric ward to staff member’s housing recommendations for each patient upon discharge to find very little relationship between the client and staff assessments. This was particularly the case for issues of independence and structure. They found that 6% of consumers compared to 78% of staff preferred a living situation with others not of their choosing, presumably congregate housing. A total of 61% of the staff and 4% of the patients felt that 24-hour staff presence was needed at the consumer’s place of residence upon discharge (Minsky, Riesser & Duffy, 1995). However, both staff and consumers agreed on the importance of additional independent support services, and that these services would ideally be provided by both professionals and peers. The degree of importance of having help with finances was viewed differently by staff than by consumers—staff viewed it as more important than consumers. In addition, 59% of consumers felt that having a lease in their name was important, while only 4% of staff did. Half the consumers felt that choosing their own furniture and cooking for themselves was important, while only 6% of staff did. Living in housing not controlled by one’s provider was important to 46% of consumers yet only 8% of staff. Fully 75% of consumers felt that having a say in their medication and holding a job was very important, while most staff did not. Clear differences seem to exist between clinicians’
tendency toward recommending more restrictive living settings, while consumers prefer living situations with greater independence.

**Results of the Systematic Review: Pre-post Studies**

*Effectiveness of Specific Factors of Intervention*

**Residential Stability as Outcome**

- Middelboe (1997) examined residential tenure among 76 participants provided housing in small residences (3-4 residents per unit, referred to as supported housing rather than group homes with moderate fidelity to supported housing principles) in Copenhagen. One year after program entry, 83% of participants still lived in the residential settings. Residents with a higher level of psychiatric symptoms and a lower global functioning at baseline were more likely to drop out of the program; no differences in program retention were found for age, diagnosis, gender, social integration or social functioning. The lack of a control group and the fact that residential staff administered the instruments suggests that there are potential threats to internal validity of the study and therefore the findings.

- Housing tenure was also tracked in Martinez and Burt (2006) study of the effectiveness of a supported housing program in San Francisco with high fidelity to supported housing principles. Two hundred thirty-six homeless individuals (91% of which also had a diagnosis of current or past substance abuse) were provided single room occupancy units with a “low demand” approach and an array of on-site services including case management, psychiatric care, health care and vocational training. Retention rates were found to be 81% after one year, and 63% after two years. There was no indication that substance abuse diagnosis related to tenure, although this was difficult to determine given the low number of non-substance abusing participants. This study demonstrates that the “low demand” approach of supported housing, including the lack of a sobriety requirement for housing, can be effective among a substance abusing population.

- Goering, Wasylenki, Lindsay, Lemire, and Rhodes (1997) examined the effectiveness of providing assertive case management services to homeless individuals with severe mental illness who were referred by hostels (publicly funded housing in Ontario for those with no means to pay). They found that overall scores for housing improved from baseline to 18 months. Significant housing improvements from 9 to 18 months also were made, but the degree of improvement was not as great as it was from baseline to 9 months; specifically, number of weeks in permanent housing increased, weeks in shelter decreased, number of moves decreased and satisfaction with housing increased, but inadequate conditions did not improve. This study showed that housing improvements can continue to be made even after the initial stages of case management, underlining the importance of long-term case management services.

Bolton (2005) conducted a study (a doctoral thesis) designed to examine the clinical effectiveness of supported housing services in Philadelphia. The study involved 122 individuals with mental illness who had been homeless. All were residents of
Philadelphia who had been free of substances for a minimum of 6 months. The goal of the housing was to maintain or improve clients' socialization, psychiatric functioning, independent adult living skills, quality of life and housing stability.

The experimental intervention involved placing individuals in single apartments (with tenant leases) and providing support services separately through one of 3 participating mental health agencies. Services and supports were provided through case management which combined clinical, vocational and brokered-case management services. Specific services included: crisis intervention, hospitalization when needed, medication management, counseling, skill training related to the following areas: self care, health care, housekeeping, mobility, money management, interpersonal relationships, vocational/educational pursuits, recreation, and community participation. Data were collected on average over 9 quarters or 2.5 years (though data on some participants was available for 5 years).

Results for housing stability suggested that 68% of the clients were able to maintain stable housing, 29% failed to maintain stable housing and 3% did not inform their caseworker of their new updated housing status.

Pearson, Locke, Montgomery and Buron (2007) performed a pre-post study of housing first programs in three locations for the Department of Housing and Human Development. A total of 80 clients in three locations (NYC, San Diego and Seattle) were entered into the study in three locations during the years 2003-2004. Extensive baseline descriptive information was collected by their case managers and they were tracked for a one year period to examine their housing tenure. The clients in the study had a mental illness and a high percentage had a co-occurring substance-related disorder.

Findings suggested that 43 percent (n = 34) of the clients remained in the Housing First program for a year and stayed in their housing unit for the entire time (Stayers); 41 percent (n = 33) remained in the program for a year and spent at least one night in some other temporary living environment (Intermittent Stayers); and the remaining 16 percent (n = 13) of the clients left the program or died within the first 12 months of enrollment (Leavers). The authors concluded that despite the history of homelessness and severe mental illness of the clients served, 84 percent (n = 67) of the clients tracked for this study remained enrolled in the Housing First program at the 12th month. The differences among those designated as Stayers, Intermittent Stayers, and Leavers suggest that Leavers and Intermittent Stayers more often entered the Housing First program from the streets. In addition, both Intermittent Stayers and Leavers experienced higher levels of impairment related to psychiatric symptoms during their last month in housing compared to Stayers.

In terms of limitations, this study relies on a pre-post design and it is not entirely clear how the sample was selected. It appears that all new enrollees in the program were entered into the study for followup, but that is not explicitly stated. The differences among the three sites suggest that perhaps fidelity of the intervention was an issue as the Pathways to Housing program in NYC achieved the best housing stability outcomes (Pathways to Housing was the originator of the housing model).
In a study of the impact of housing subsidies, Newman, Reschovsky, Kaneda, and Hendrick (1994) examined the effect of providing Section 8 vouchers on the housing status of individuals who were homeless and mentally ill. They found that Section 8 certificate use was associated with a successful move to independent housing. Ninety percent of the 148 individuals in the study who were followed up moved from the streets or group homes to living independently, most often living alone. However, 299 individuals were provided vouchers, so high attrition could bias the results.

Rosenheck and Dennis (2001) examined the outcomes of 1,617 clients who all received time-limited ACT services (but not provided housing). Specifically, they were interested in the differences between participants who were “successfully” discharged from ACT, those who continued receiving ACT services and those who left the program on their own accord. They found no differences between clients who had and had not been discharged from ACT when compared at the 3, 12 and 18 month assessments. They also found that clients with longer tenure in ACT had better housing outcomes. Clients "successfully" discharged, clients referred to case management and clients referred to supported housing showed better housing outcomes relative to the clients referred to substance abuse programs, clients who continued in the ACCESS case management program, those that were hospitalized or left the program on their own.

In another published article of the ACCESS study, Mares and Rosenheck (2004) examined housing outcomes for 5,325 homeless adults from the ACCESS study who had been receiving intensive case management and completed the one-year follow-up assessment (2004). Thirty-seven percent of this sample was stably and independently housed one year after entering case management. Yet, 26% of the original sample had unknown outcomes and were excluded from analyses, thus it is likely that the housing retention rate would be even lower for the complete sample.

Hanrahan’s study of the “Thresholds’ Mothers’ Project” was another promising pilot study of a specialized intervention for a subgroup of consumers. Hanrahan tracked 24 homeless mothers with a severe mental illness who received intensive care management services as they transitioned to permanent housing. The program showed that it may help mothers maintain stable housing; all of the 19 participants who completed follow-up were living in independent or supportive housing one year after enrollment in the program (Hanrahan et al., 2005). However, this study was plagued by small sample size, significant attrition (6 out of 24 lost to follow-up), and lack of a comparison group, so more research is needed to support these findings.

Social Support, Satisfaction and Quality of Life as Outcomes

Middelboe’s study mentioned above (1997) also examined social support and quality of life among residents who were provided housing in Copenhagen. Social integration, number of reciprocal contacts and quality of life increased one year after program entry, but residents’ social networks did not change. These findings should be interpreted with
some caution as the fact that residential staff administered the instruments suggests potential threats to internal validity of the study and therefore the findings.

◦ Newman et al. (1994) study of the impact of providing Section 8 housing vouchers found that consumers’ ratings of housing quality rose after moving to independent housing (primarily, ratings of housing affordability and quality of housing rose, while ratings of neighborhood conditions and service gaps did not). However, with roughly 50% attrition, these findings should be interpreted with caution.

◦ Goering et al. (1997) study of the effectiveness of assertive case management in Ontario found that social functioning improved from baseline to 18 months, as well as from 9 months to 18 months, although the magnitude of change from baseline to 9 months was greater than the change from 9 months to 18 months. While social acceptability, activity, work, personal care and relationships all improved from 9 to 18 months, self maintenance significantly declined, returning to baseline levels. Clients with a better working alliance with their case manager and those who used a greater amount of services showed more improvements in social functioning.

As described earlier, Bolton (2005) conducted a study designed to examine the clinical effectiveness of supported housing services in Philadelphia. The study involved 122 individuals with mental illness who had been homeless. The experimental intervention involved placing individuals in single apartments and providing separate support services. Case management was the primary vehicle through which services and supports were provided which combined clinical, vocational and brokered-case management services. Specific services included: crisis intervention, hospitalization when needed, medication management, counseling, skill training related to the following areas: self care, health care, housekeeping, mobility, money management, interpersonal relationships, vocational/educational pursuits, recreation, and community participation.

The authors rated study participants as being: 1) “treatment successes” if they maintained adequate functioning in that area or improved in their functioning or 2) “treatment failures” if they did not improve or deteriorated. Given those designations, the authors found the following successes and failures in various domains: in terms of social functioning 76% were considered "treatment successes"; of those that entered with poor social functioning (N=21), 76% did not improve or deteriorate and were considered treatment failures. Related to independent living skills, 73% were considered "treatment successes"; of those that entered with poor independent functioning, (N=24), 90% did not improve or deteriorate and were considered treatment failures. In terms of quality of life, 53% were considered "treatment successes"; of those that entered with low quality of life, (N=42 out of 88) 81% did not improve and were considered treatment failures.

Psychiatric Symptoms as Outcomes

◦ Goering et al. (1997) aforementioned study examining assertive case management in Ontario also found that measures of psychiatric symptoms similarly improved from baseline to 18 months, as well as from 9 months to 18 months, although, like their
findings of social functioning, the degree of improvement was lesser in the later follow-up period. Specifically, symptoms of hostility and anxiety decreased, but thought disorder and withdrawal did not improve. Clients with a better working alliance with their case manager showed greater improvements in symptoms (Goering et al., 1997).

As described above in Bolton’s 2005 pre-post study of the clinical effectiveness of supported housing services the authors rated study participants as being: 1) “treatment successes” if they maintained adequate functioning in that area or improved in their functioning or 2) “treatment failures” if they did not improve or deteriorated. Given those designations, the authors found 80% were considered "treatment successes" relative to psychiatric symptoms. Of those that entered with poor psychiatric functioning, (N=6) 50% maintained that level and were considered treatment failures. A diagnosis of substance abuse was the strongest predictor of program retention (among demographics and all other baseline measures of outcome variables); the second strongest predictor of housing stability was improvements or maintenance of psychiatric symptoms.

Hospitalizations as Outcomes

- Middelboe’s (1997) study mentioned above also found that hospitalizations markedly decreased among residents in supported housing. There was some indication that psychiatric symptoms may have decreased, although not all measures of symptoms showed a decline. As previously mentioned, Middelboe’s findings should be interpreted with some caution.

- Newman and colleagues’ aforementioned 1994 (Newman et al., 1994) study on the impact of providing Section 8 housing vouchers also found that hospital days declined with certificate use (Newman et al., 1994). Number of service needs increased with certificate housing; perhaps because once residents attained housing stability, they were able to focus on other personal needs beyond housing. Unfortunately, only 148 of the 299 individuals provided a voucher were followed successfully, limiting the degree of confidence in these findings.

- Comparing the 12 months before moving into a supported housing program (with a moderate degree of fidelity to principles of supported housing) to the 12 months after move-in, homeless consumers with dual diagnoses decreased their emergency department visits and inpatient admissions (Martinez & Burt, 2006).

- Supporting the findings of Martinez and Burt (2006), Hanrahan, Luchins, Savage, and Goldman (2001) found that the mean number of days in the hospital decreased significantly from 48 during the year before placement into a community integrated residential treatment program to 5 days during the year of housing placement. The sample included 74 residents of a program that with low adherence to the supported housing model (Hanrahan et al., 2001). Given that this study involved low adherence to supported housing model, results should be interpreted cautiously.
Characteristics of Residents/Clients/Consumers

Residential Stability as Outcome

- In Mares and Rosenheck’s (2004) study of ACCESS participants, individuals with less severe mental health symptoms and addiction problems were most likely to become independently housed one year after being placed into case management.

Functioning/Community Integration, Satisfaction and Quality of Life, and Psychiatric Symptoms as Outcome

- In a study of 244 individuals with schizophrenia who had previously been discharged from long-term hospitalization in Germany, Kallert, Leisse, and Winiecki (2007) examined the functioning, life satisfaction and psychiatric symptoms of residents living in five types of residential situations: nursing home of a large psychiatric hospital, social therapeutic hostel (similar to a group home with on site staff and services), a sheltered community residence (akin to supported housing—living independently with weekly case management visits), with family or living alone with no supports. Participants were interviewed once, then again two years later; their caregivers also completed two assessments on the participants’ level of functioning at each time-point. Analyses pinpointed areas of functioning where statistically significant deteriorations occurred. Direct comparisons of the outcomes between the different residential settings were not warranted, nor reported because placement into housing type was clearly confounded with severity of illness, where those in the nursing home settings were shown to be more severely disabled than individuals in the other settings.

Patients in nursing homes showed a deterioration in overall social adjustment over the 2 year period; they also showed an increase in all 4 caregiver measures of needs for care (clinical and social problems, and clinical and social unmet needs). Regarding social adjustment, those in psychiatric nursing homes were the only one of the five housing types to show a global deterioration in social adjustment.

Patients in the social therapeutic hostels and living alone showed an increase in caregiver-rated “clinical problems.” Some area-specific deteriorations were observed within some of the other residential settings other than the psychiatric nursing homes, but those living alone showed the greatest number of deteriorations—5 of the 6 sub-categories showed a significant decline over the two year period—physical hygiene and presentation, communication/social withdrawal, consideration for other people, parent role and citizen role. Patients in the nursing home and the social therapeutic hostels (similar to group homes) showed a decline in overall life satisfaction over the 2 year study period. Patients in nursing homes showed deterioration in their overall psychopathology, but patients in the social therapeutic hostel showed an improvement in positive psychotic symptoms.

Effectiveness of PAR process
One study employed a Participatory Action Research process as part of their study of consumer housing preferences in Ontario (Nelson et al., 2003). The authors were able to document the value of this approach which involved the distribution of research results to participants and inviting participants (even compensating them for travel costs) to an annual conference where results were fed back to the community stakeholders. In one of the few studies to use a participatory research approach, these authors describe the value of using constituents in the design and interpretation of the findings.

**Results of the Systematic Review: Needs Assessment**

**Characteristics of Residents/Clients/Consumers**

**Costs of Housing and Supports as Outcomes**

◦ Jarbrink et al. (2001) used a cross-sectional design to compare the health and social needs as well as the costs of providing services within 238 consumers living among three different types of housing arrangements. The types of housing compared were independent housing with no supports, supported housing (in an independent or shared living arrangement), or a group home with on-site staff. They found that the average number of needs was higher for residents of group homes than supported living. The percentage of residents that expressed five or more needs was higher in group homes (34%) and general housing (36%) than in supported living (14%). The percentage of “serious” needs reported as a proportion of all needs was 46% among general housing, significantly higher than supported living (20%) or group homes (8%). Psychological distress and physical health were the most common concerns. Supported housing residents reported fewer concerns for food, looking after the home, and money than those living in group homes or in general housing. Eighty-two percent of all needs were met by professionals or informal caregivers, with no differences between housing types. Tenants of group homes had a greater percentage of their needs met by professionals than those in supported living or general housing, suggesting that those in supported living or general housing relied more on natural supports such as their family and friends. Three consumers’ needs were related to higher costs: difficulties with getting enough to eat, difficulties with self care and difficulties budgeting money. Findings should be interpreted with caution because the authors were unable to determine the extent to which tenants had the opportunity to choose their own level of services or housing type. The amount of information provided to tenants regarding available services and the variations in the housing availability likely affected the consumers housing and service usage decisions, limiting the confidence in the findings.

**Concordance of Clinician and Consumer Assessments**

**Service Usage as Outcome**

◦ In another needs assessment study, Rosenheck and Lam (1997a) examined 1,482 homeless participants from the ACCESS study from 15 US cities who were recruited by an outreach worker and subsequently admitted into the case management program.
Service needs were assessed by the clinical outreach worker who recruited clients, then by the client at the time that they entered case management services, approximately 2 weeks later. The clients’ service usage over the previous 60 days was also compared to their own report and their outreach worker’s report of their service needs. They found that clients most frequently reported a need for housing (91%), as well as a need for mental health services (78%) and dental services (73%). Clients were more likely to differ with providers on their greater likelihood of perceiving a need for dental and medical care, while providers were more likely than clients to perceive clients’ need for mental health care and substance abuse treatment. Agreement between clients’ and providers’ perception of need were low, albeit significantly correlated for all domains (dental, medical, financial support, job assistance, substance abuse services) except housing and mental health services. Both clients and providers' assessments of need were significantly and positively correlated with use of mental health and substance abuse services. Providers’ assessment of need was related to use of medical services and housing (Rosenheck & Lam, 1997a). Because providers most frequently identified mental health and substance abuse services as needs for consumers, the authors conclude that providers would benefit from a more integrated service system as providers seem to be biased toward perceiving needs in consumers that relate to their own field or profession. By integrating mental health services with housing, medical, dental, employment and other types of services, providers may become better able to detect needs within the variety of areas that consumers often require assistance.

**Housing Preferences**

*Characteristics of Residents/ Clients/ Consumers*

In a cross sectional study of needs among 45 consumers of a supported housing program in Copenhagen, Middelboe, Mackeprang, Thalsgaard, and Christiansen (1998) found that 66% of participants said that their current living arrangement was in accordance with their preferred type of living situation and only 9% of consumers wanted to live in group homes. When asked about unmet needs, at least half of the respondents indicated that they needed help with the following categories: company (i.e., social interaction) dealing with psychological distress, daytime activities, looking after the home, psychotic symptoms, food, information and accommodation. Residential staff rated consumers’ unmet needs highest within the areas of dealing with psychological distress, company, and psychotic symptoms. Staff rated consumers’ unmet needs for alcohol and drug services as about twice as high as the residents rated them for themselves. In general, the authors concluded that the needs expressed had to do with the occupational and social spheres. Unfortunately, the authors do not describe how representative this sample is of the larger population and do not describe any difficulties they experienced with recruitment. Therefore, it is difficult to know how much their findings are representative of the broader population.

*Satisfaction and Quality of Life as Outcome*
Nelson et al. (2003) conducted a study of current and preferred housing among residents of southwest Ontario. They found that people living in their preferred housing had a much higher quality of life than those not living in preferred housing. A total of 80% said they preferred independent housing and virtually no respondents stated they preferred living in a shelter. When asked about unmet needs, respondents indicated that they needed help with transportation, benefits, money and telephone usage, dealing with emotional upsets, budgeting and managing medications. Overall, the authors concluded that financial needs and isolation difficulties predominated the needs expressed. Unfortunately, the authors do not describe how representative this sample is of the larger population and do not describe any difficulties they experienced with recruitment. Therefore, it is difficult to generalize their findings.

**Conclusions from the Systematic Review: Correlational, Pre-post Studies, and Needs Assessment**

- In correlational and pre-post studies, housing retention rates one year after placement range from less than 50% (Mares et al., 2004) to over 80% (Kasprow et al., 2000; Martinez & Burt, 2006; Middelboe, 1997; Wong et al., 2008).

- Supported housing interventions and services, especially programs that emphasize residents’ choice for housing, are related to housing stability and improvements in housing satisfaction and quality of life (Srebnik et al., 1995; Nelson et al., 2003).

- In one long term follow-up study, residents of high, medium and low intensity housing the percentage remaining housed five years post-placement was 37%, 54% and 56% (Lipton et al., 2000), respectively. Risk of loss of housing was greatest within the first four months after placement.

- Use of acute services, including time spent in shelters, emergency rooms and hospitals decreased with the provision of housing supports (including case management) or supported housing services (Goering et al., 1997; Wong et al., 2008; Martinez & Burt, 2006; Newman et al., 1994; Harahan et al., 2001; Middelboe, 1997) and use of shelters (Wong et al., 2008).

- Housing retention rates increase with the provision of subsidies (Newman et al., 1994) and long-term (Goering et al., 1997; Rosenheck & Dennis, 2001) and intensive (Mares et al., 2004) case management services.

- Opportunity for obtaining one’s housing preference appears to be more related to improvements in quality of life and social support than to housing tenure (Nelson et al., 2003; O’Connell et al., 2006).

- Choice in housing is related to a reduction in homelessness and psychiatric symptoms (Greenwood et al., 2005).
Providing multiple services is important in implementing a housing program (Pollio et al., 2000).

Psychiatric symptoms decreased over time for individuals receiving case management services linked to housing (Goering et al., 1997).

Rapid entry into housing increases housing tenure (Mares et al., 2004).

Individuals with psychiatric disabilities report wanting independent housing, in non-congregate settings (Schutt & Goldfinger, 1996; Middelboe et al., 1998; Nelson et al., 2003).

Higher quality housing may lead to better housing outcomes, reduced mental health costs and better functioning (Harkness et al., 2004; Nelson, Hall, & Bowers, 1998).

Housing affordability and use of Section 8 vouchers predicts exit from homelessness, achievement of stable independent housing, as well as increases in housing quality (Rosenheck et al., 2001; Newman et al., 1994).

Social capital and service system integration affect housing outcomes but not clinical outcomes (Rosenheck et al., 1998).

Unmet needs of individuals in residential settings include financial assistance, problems with isolation, and clinical issues (i.e. managing symptoms and distress) (Middelboe et al. 1998; Nelson et al., 2003).

There are wide discrepancies between the perceptions of needs and preferences among clients and staff (Minsky et al., 1995). Relative to clients, staff are more likely to perceive a need for clinicians’ control, group living, and supervision (Goldfinger & Schutt, 1996) as well as a for mental health and substance abuse treatment services (Rosenheck & Lam, 1997a).

Generally demographic features were not helpful in predicting housing tenure (Mares et al., 2004); however, one study found that women were more likely than men to achieve stable housing (Kasprow et al., 2000).

Severity of illness is a predictor of poorer housing outcomes (Mares & Rosenheck, 2004; Wong et al., 2008; Middelboe, 1997).

Receiving residential treatment prior to entry into supported housing does not appear to improve housing outcomes (Mares et al., 2004).

Variations in service systems (e.g. funding for services, types of services available, clients’ proximity to services) are more important in predicting service usage than individual characteristics (e.g. gender, diagnosis, race) (Rosenheck & Lam, 1997b).
Housing stability is associated with programs that provide flexible services that match the current needs of the consumer, allowing clients to utilize more services around the time of their move and slowly taper them off thereafter (Pollio et al., 2000).

Housing in buildings with fewer units and a greater proportion of residents with a mental illness were associated with housing stability (Harkness, et al., 2004).

Buildings with fewer residents are preferred by consumers (Schutt & Goldfinger, 1996) and are related to better independent functioning (Nelson, Hall, & Walsh-Bowers, 1998). Less “normalized” housing appears to be associated with shorter housing tenure (Lipton et al., 2000).

At least one study attempted to examine neighborhood characteristics (Yanos et al., 2007); they found that these factors were weakly related to the community integration of those in supported housing.

Low demand supported housing approaches that do not have sobriety requirements may be just as effective in retaining consumers in independent housing among consumers with substance abuse as among those without substance abuse (Martinez & Burt, 2006).

Retention in independent housing was related to service use: those receiving outpatient counseling were more likely to stay in housing; those who used inpatient or acute services left the residential situation for more dependent housing (Wong et al., 2008).

Conclusions from the Systematic Review: Methodological Conclusions

Attempts to study the physical features of housing or neighborhood characteristics (e.g. floor plan, layout of rooms, amount of integration with the community, quality of housing) are relatively complex (Lipton et al., 2000; Yanos et al., 2007) and rudimentary. There appear to be few standardized approaches to measuring this aspect of supported housing.

IV ACKNOWLEDGMENTS AND STATEMENT CONCERNING CONFLICT OF INTEREST

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No study group member has a conflict of interest in this area of supported housing. The Center does not have a supported housing grant at this time and no individual has a fiduciary interest in the delivery of supported housing services.

V. REFERENCES

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