

Employment Services and Employment Rates Using Cross-Sector Data to Evaluate Cross-Sector Service Delivery

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Abstract

Adults with severe and persistent mental illness who received employment services through mental health and/or vocational rehabilitation programs in Vermont during FY2001 had higher employment rates than individuals who did not receive any employment services. Individuals who received services from both programs had significantly higher employment rates than individuals who received services from only one program. Results indicate that older clients and clients with a schizophrenia diagnosis benefited more from employment services than individuals not in these groups. This statewide study relied exclusively on analysis of administrative/operational databases that provide the employment rates for both recipients of employment services and other clients.

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The competitive employment of recipients of community mental health services is an important indicator of community mental health program and service system performance. The National Association of State Mental Health Program Directors' President's Task Force on Performance Measures, for instance, recognized the importance of monitoring employment rates for adults with serious mental illness: "For payers, this is the payoff... Monitoring this outcome for populations with mental illness... is critical. This was considered a critical outcome to track." For similar reasons, the new federal Performance Partnership (Block) Grant program (Federal Register, 2002) requires annual reporting by all states of employment rates for recipients of publicly funded mental health services.

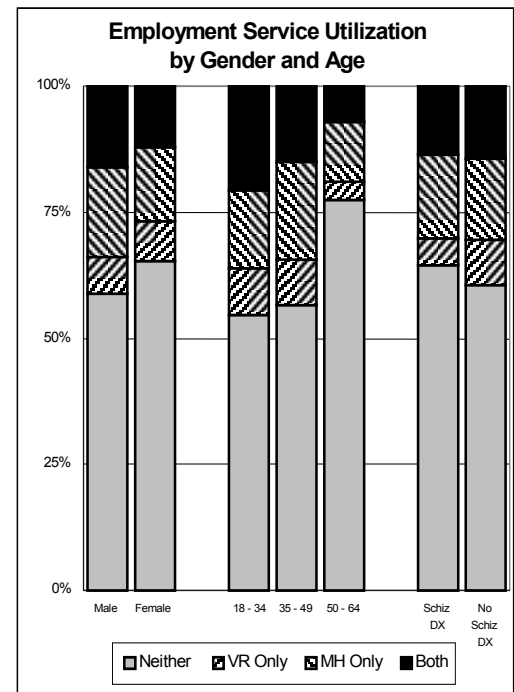
This presentation takes a step beyond the simple reporting of employment rates by examining the impact of employment services on employment rates. Employment rates for four groups of adults who received community-based services for severe and persistent mental illness are examined. Employment rates for recipients of employment services from both Community Mental Health Centers (CMHC) and the state Division of Vocational Rehabilitation (VR) are compared to employment rates for adults who receive only CMHC employment services, adults who received only VR services, and adults in the same treatment program who received no employment services.

The existing literature tends to focus on relatively small numbers of individuals and to rely on self-report or clinician report of client employment status. This presentation uses official reports of employment status for all service recipients that were obtained from a state agency administrative database to measure employment status. It introduces a measure of the "relative effect" of employment services. This measure compares the employment rate of recipients of employment services with the employment rate of other mental health service recipients who received no specialized employment services. Our comparison of "relative effect" to simple employment rates has important implications for the evaluation of employment programs for adults with severe and persistent mental illness.

Subjects

This research studied 2,938 adults aged 18 to 64 who were served by Community Rehabilitation and Treatment (CRT) programs for adults with severe and persistent mental illness in Vermont during FY2001. Men and women were represented in this population in about equal numbers (52% female; 48% male). One fourth (25%) of the people served were in the 18 to 34 year age group, 46% were aged 35 to 49, and 29% were aged 50 to 64. More than one third (37%) of the people served had a schizophrenia diagnosis (295.xx).

During this study year, 38% of these adults received employment services through the local community program and/or the state Division of Vocational Rehabilitation. Fourteen percent received both CMHC and VR services, 16% received CMHC employment services only, and 8% received VR services only. Men were more likely than women to receive employment services (41% vs. 35%), adults in the 50 to 64 year age group were less likely to have received employment services than adults in the 35 to 49 and 18 to 34 age groups (22% vs. 43% and 45%), and adults with no schizophrenia diagnosis were more likely to receive employment services than those who did have this diagnosis (39% vs. 35%).



Method

This research is based entirely on an analysis of existing administrative/operational databases maintained by three Vermont State agencies. The data sets used in this analysis include the CMHC client and service data set, the VR client data set, and the Department of Employment and Training (DET) unemployment insurance data set for FY2001. The DET database includes employment information submitted by Vermont employers in conformance with state and federal unemployment laws.

The CMHC and DET data sets used in this analysis include the social security number of each individual in the data set, but the VR data set includes no unique person identifier. For this reason, a combination of deterministic record linkage and probabilistic estimation of caseload overlap was used in this analysis.

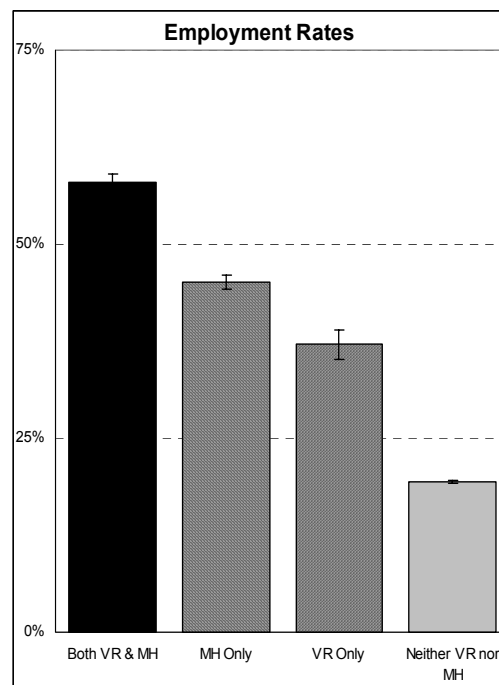
The CMHC and DET data sets were linked using social security number as the key. Since the VR data set used in this analysis does not include a social security number, direct record linkage of the combined CMHC-DET data set to the VR data set is not possible. Both of these files, however, include the date of birth, and gender for each service recipient. These data elements provide the information required for Probabilistic Population Estimation to measure the number of people represented in both the CMHC-DET data set and the VR data set. Probabilistic Population Estimation is a statistical procedure that provides valid and reliable measures of caseload overlap when personally identifying information is not available. These estimates are based on a comparison of the observed distribution of dates of birth in the data sets to the expected distribution in the general population (Banks & Pandiani, 2001).

In order to measure the magnitude of the impact of CMHC employment and/or VR services on employment rates, a measure of “relative effect” was calculated by dividing the employment rate for CMHC and/or VR service recipients by the employment rate for CRT client who received no employment services. A relative effect that is less than “1” would indicate that CMHC and/or VR employment service recipients were less likely than others to be employed. A relative effect greater than “1” would indicate that CMHC and/or VR employment service recipients were more likely than others to be employed. A relative effect of 3.5, for instance, would indicate that recipients of a particular service (or combination of services) were 3.5 times as likely to be employed as clients who did not receive these services.

Findings

Individuals who received both VR and CMHC employment services were significantly more likely to be employed than individuals who received CMHC employment services only (58% vs. 45%). Individuals who received CMHC employment services only were significantly more likely to be employed than individuals who received VR services only (45% vs. 37%). All three groups of clients who received employment services were significantly more likely to be employed than individuals who received no employment services (19% employed). This overall pattern was evident for both men and women, for service recipients in all three age groups, and for people with a schizophrenia diagnosis as well as those without.

When the employment rates were examined from the perspective of relative effect, individuals who received both CMHC and VR employment services were found to be three times as likely as people who received no employment services to be employed during the study year (relative effect = 3.0). CMHC employment services alone had a greater effect on employment rates than VR services alone (2.3 vs. 1.9). The relative effect of employment services, however, was not felt equally by clients in different demographic and clinical groups. The relative effect of employment



services tended to be greater for men than for women (3.4 vs. 2.6), greater for older individuals than for young individuals (5.3 vs. 2.0), and greater for individuals with a schizophrenia diagnosis than for those who did not have this diagnosis (5.2 vs. 2.4)

Discussion

These findings clearly demonstrate that employment services can have a beneficial effect on the employment of adults with severe and persistent mental illness. Employment rates for recipients of employment services were always higher than employment rates for people who did not receive employment services. The relative effect of different combinations of services varied from 1.9 to 3.0. Our two measures (employment rate and relative effect), however, do not always support similar interpretations regarding the impact of employment services.

The relative effect of combined CMHC employment and VR services on the employment of people with a schizophrenia diagnosis (5.2) is much greater than the relative effect of these combined services on people who do not have a schizophrenia diagnosis (2.4). There was no difference, however, in the employment rates for people in these two diagnostic categories who had received both CMHC and VR services; 58% of both groups were employed during the year. The difference in relative effect is entirely the consequence of the difference in the employment rates of people who received no employment services. In this no-service group, people with no schizophrenia diagnosis were much more likely to be employed than people with a schizophrenia diagnosis (24% vs. 11%). The relative effect of combined CMHC and VR services is much greater for people with a schizophrenia diagnosis than for people with no schizophrenia diagnosis, even though the employment rates for the two groups were identical. Similar differences between employment rates and relative effects were also evident in this study.

Relative effect has a number of advantages over raw employment rates as a measure of program performance. Relative effect controls for the impact of ambient employment rates for different subpopulations in a study. Relative effect also allows for valid comparisons across programs where the ambient employment rates for client populations as a whole may be very different. This study was able to make this comparison because the employment database includes relevant information for all CRT clients, not only recipients of employment services. Special purpose data collection that focuses on recipients of employment services does not provide for comparison to the larger group of clients from which the clients receiving employment services was selected.

The kind of analysis reported here should be repeated on an annual basis in order to monitor changes in system performance over time. Similar analyses for different geographical regions should be conducted and compared. Findings of such analyses should consider larger economic conditions (employment rates, wealth, etc.). Finally, the influence of other treatment modalities (e.g. therapy, case management, and medication) on employment rates should be considered, singularly, and in combination with employment services.

References

Banks SM & Pandiani JA (2001) Probabilistic Population Estimation of the Size and Overlap of Data Sets Based on Date of Birth. *Statistics in Medicine*, 20, 1421-1430.

Federal Register (Tuesday, December 24, 2002). 67(247), 78, 490-78, 496.

Pandiani JA & Banks SM (2003) Large Data Sets are Powerful. *Psychiatric Services*, 54 (5), 745.

Vermont PIP reports focused on employment:

http://www.state.vt.us/dmh/Data/PIPs/Ordered_by_pages/employment.htm

METHODOLOGICAL NOTE

PROBABILISTIC POPULATION ESTIMATION

Probabilistic Population Estimation is a statistical procedure that determines the number of people (with known confidence intervals) who are represented in data sets that do not contain unique person identifiers. Probabilistic Population Estimation uses information on the distribution of birth dates in a data set to determine the number of people represented in the data set. The number of people necessary to produce the number of birthdays observed in a single birth year cohort, for instance, would be calculated using the following formula:

$$P_j(l_j) = \sum_{i=1}^{l_j} \frac{365}{365-i}$$

where “P_j” is the number of people and “i” is the number of birth dates observed. Similar logic is used to determine the number of people who appear in more than one data set. The table below provides illustrative results of Probabilistic Population Estimation for populations of specified size.

Population Estimates for Specified Numbers of Birth Dates within a Year

Birth Dates	Number of People	Birth Dates	Number of People
1	1.003 ± 0.103	180	249 ± 20
10	10.15 ± 0.776	250	423 ± 38
20	20.6 ± 1.54	300	632 ± 64
50	54 ± 4	330	860 ± 101
100	117 ± 9	360	1603 ± 325

POPULATION OVERLAP

In order to probabilistically determine the number of people shared across data sets that do not include a common person identifier, the sizes of three populations are determined and the results are compared. The number of people in each of the original data sets are the first two populations. The number of people in a data set that is formed by combining the two original data sets is the third data set.

The number of people who are shared by the two data sets is the difference between the sum of the numbers of people represented in the two original data sets and the number of people represented in the combined data set. This occurs because the sum of the number of people represented in the two original data sets includes a double count of every person who is represented in both data sets. The number of people represented in the combined data set does not include this duplication. The difference between these two numbers is the size of the duplication between the two original data sets, the size of the caseload overlap. In terms of mathematical set theory, the intersection of two sets is the difference between the sum of the sizes of the two sets (A+B) and the union of the two sets (A∪B):

$$(A \cap B) = (A + B) - (A \cup B).$$

Vermont

Adults with SMI

30% Competitively Employed

\$5,080,234

Multi-Agency Employment Services

**Impact on
Employment Rates**

Administrative/Operational Databases

EMPLOYMENT DATA

Department of
Employment & Training

SERVICE DATA

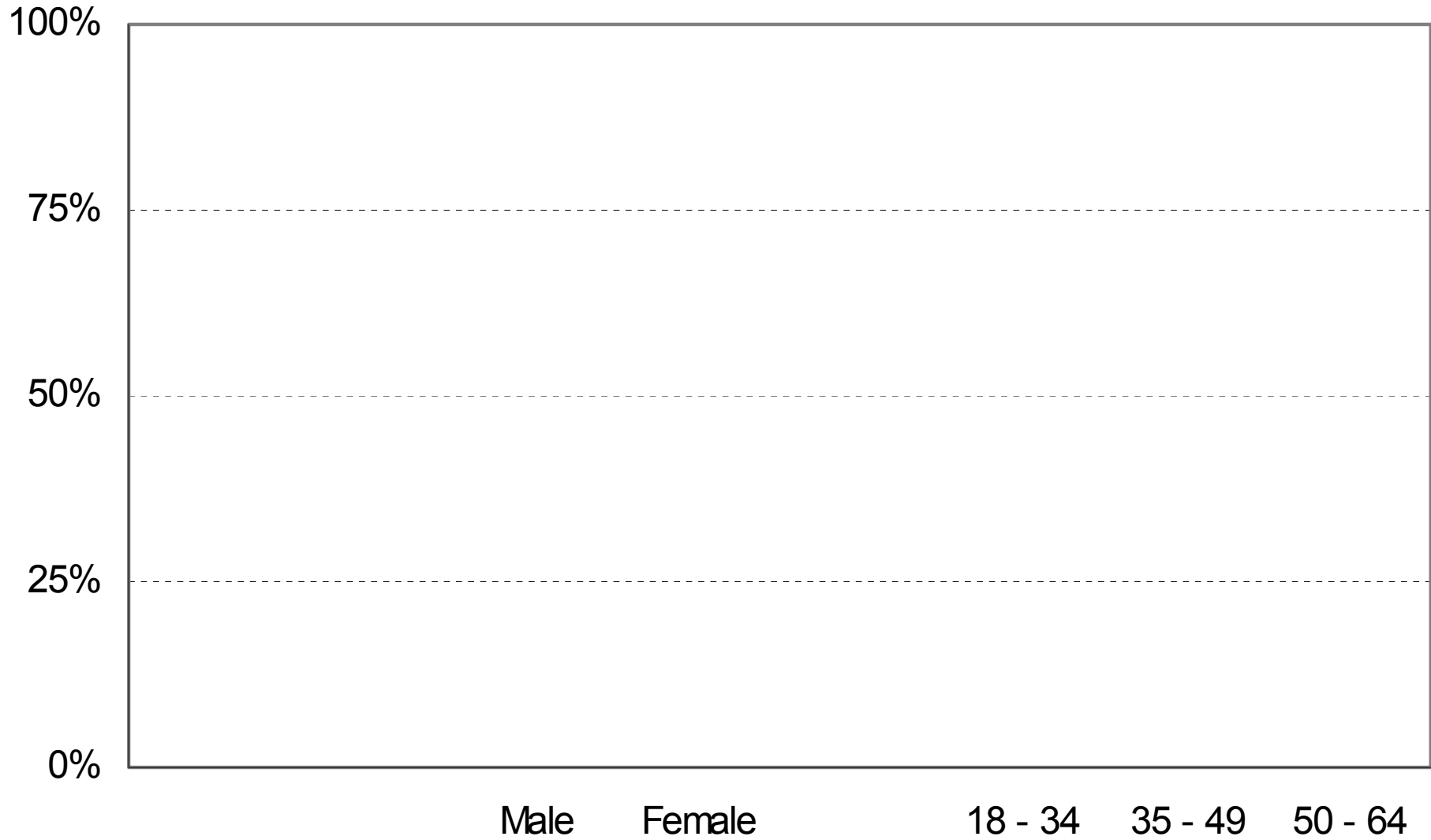
Department of Mental Health

Department of Voc Rehab

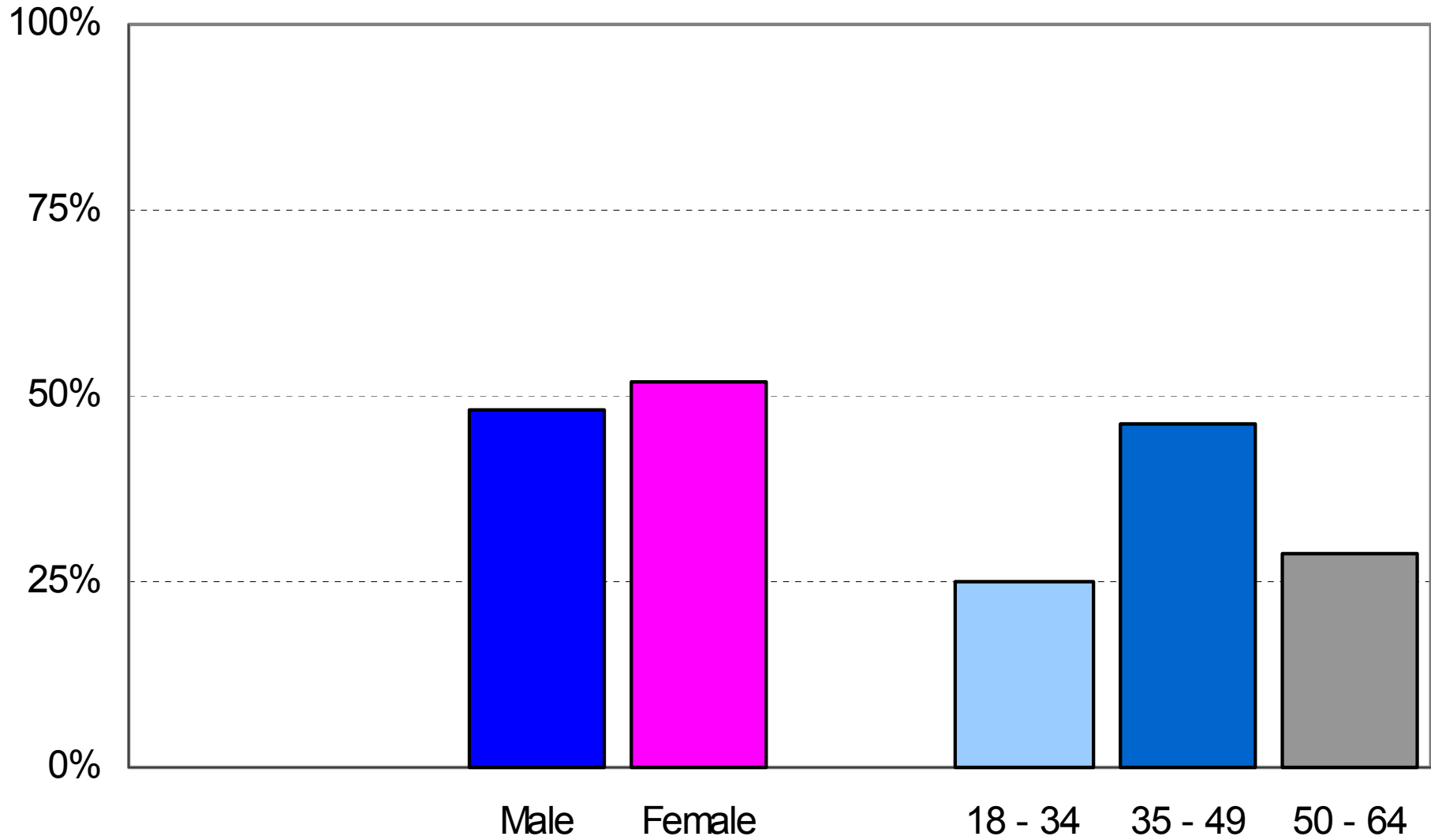
SUBJECTS

(N = 2,938)

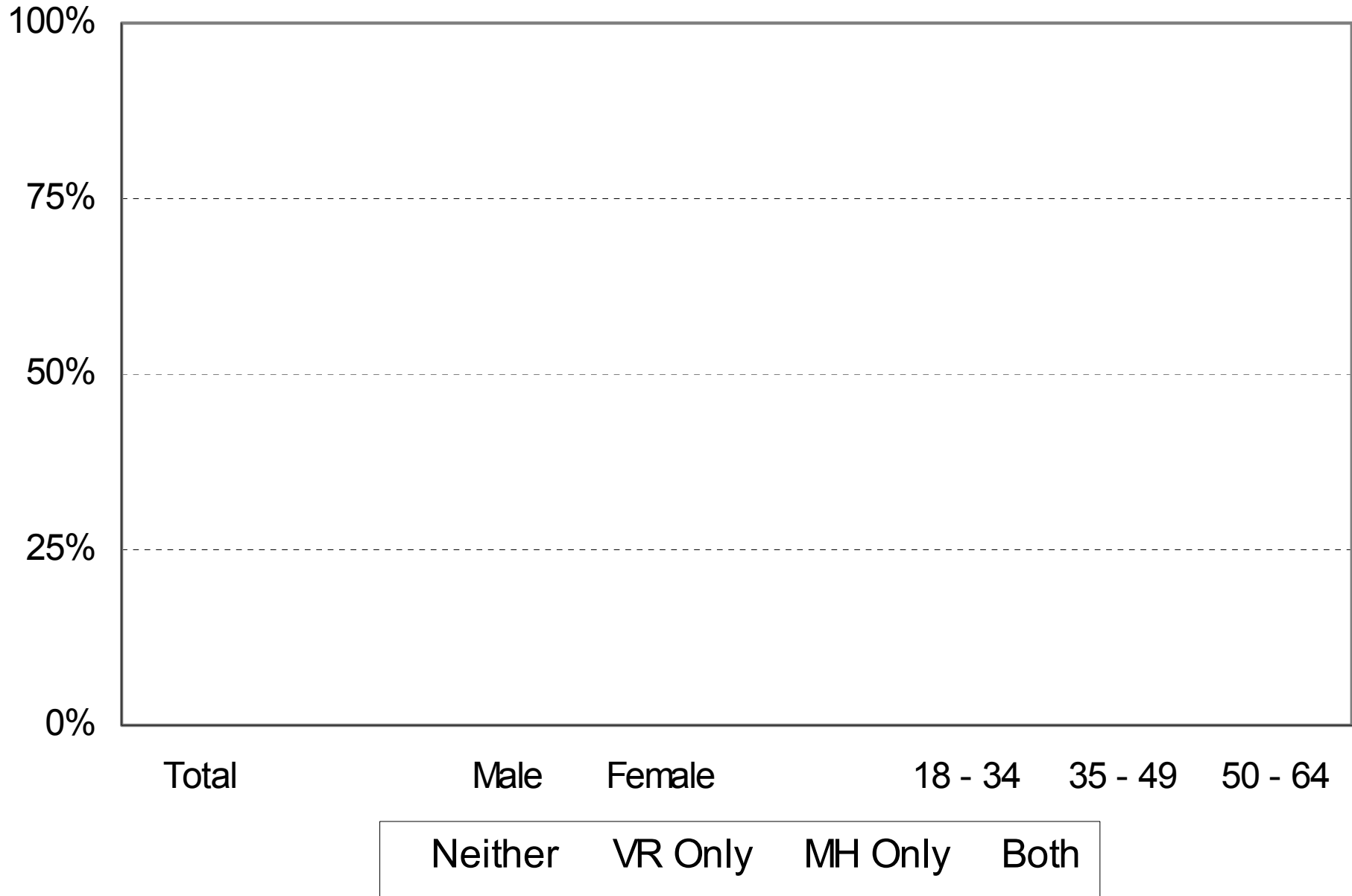
Subjects by Gender and Age



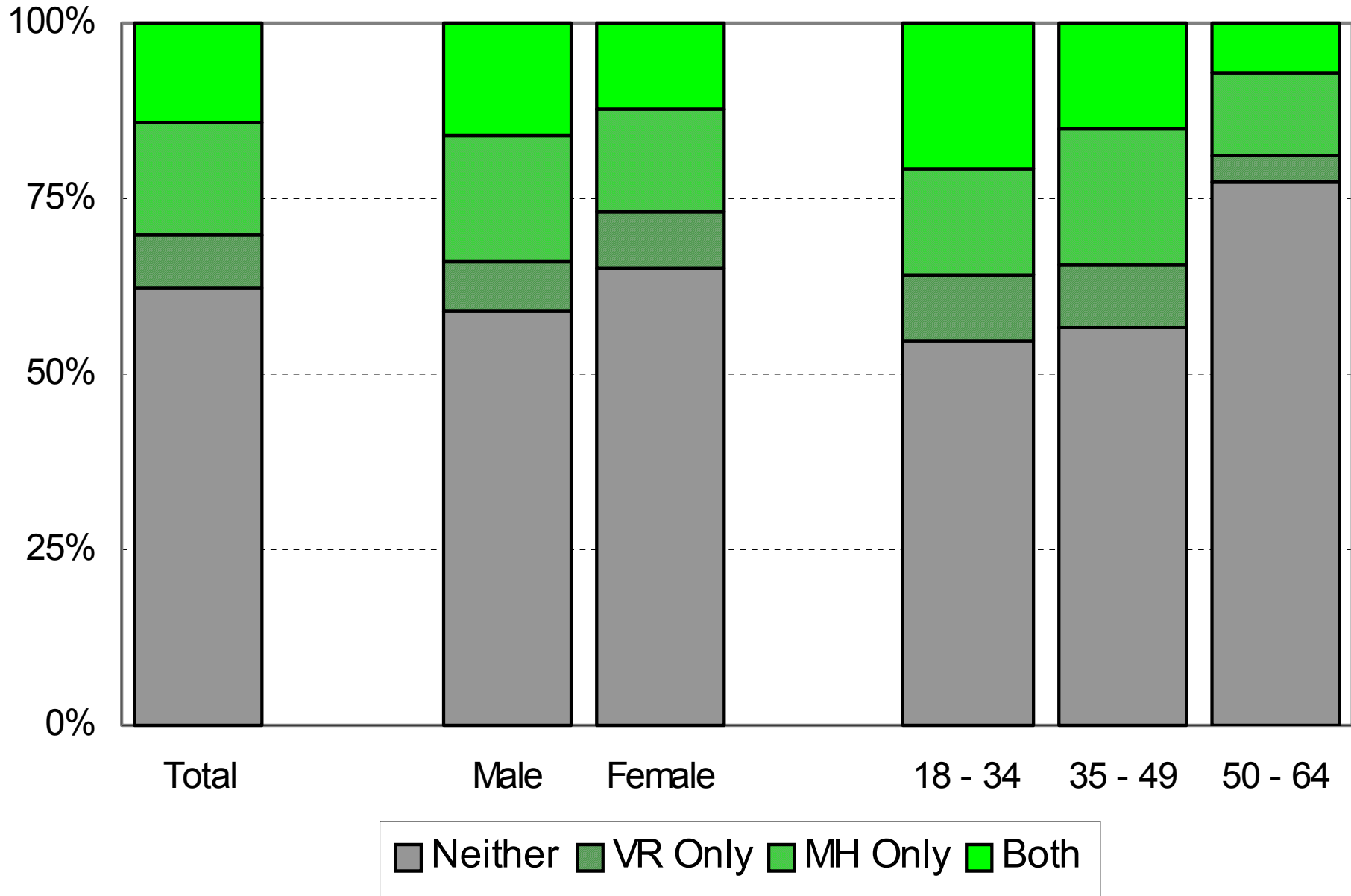
Subjects by Gender and Age



Employment Service Utilization by Gender and Age



Employment Service Utilization by Gender and Age



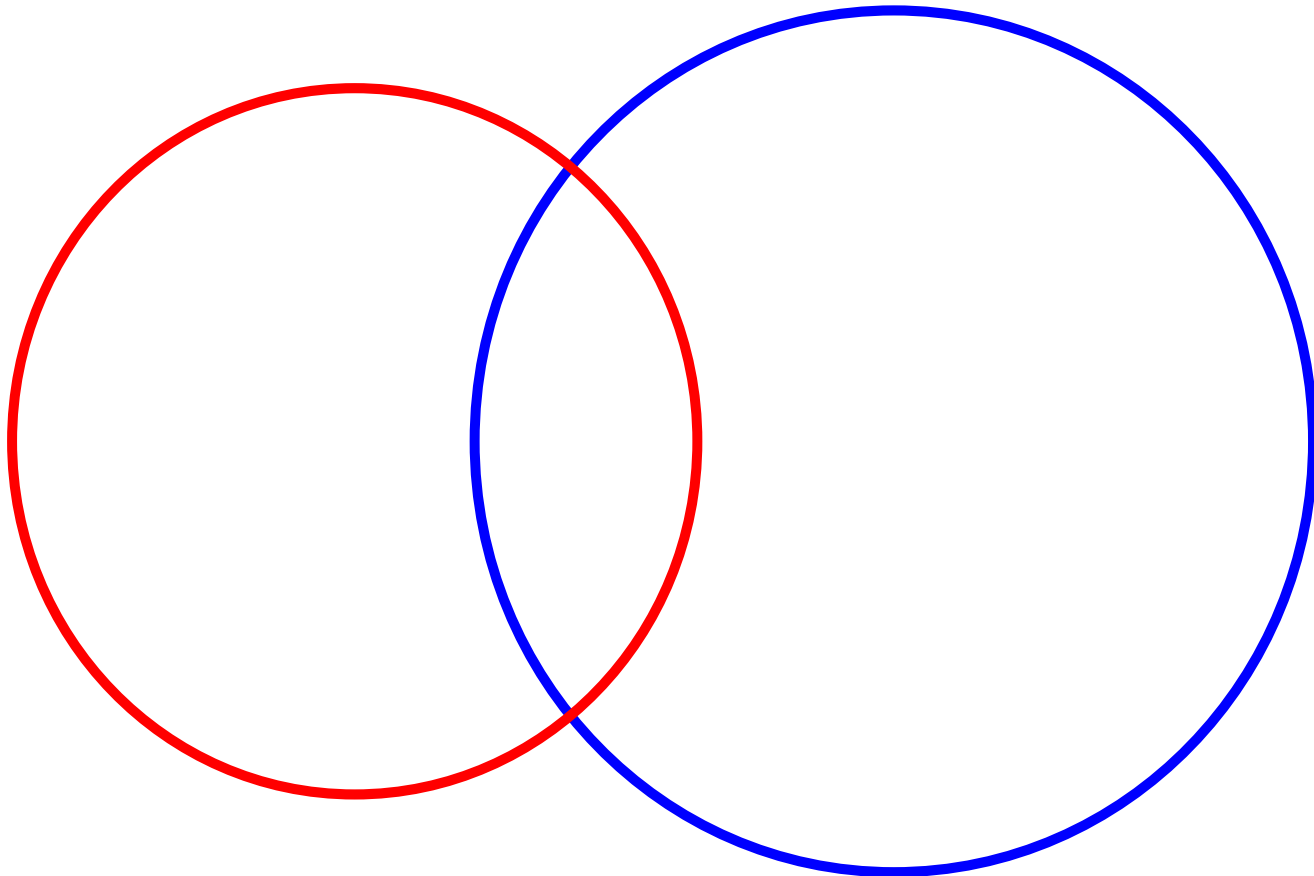
MMETHODOLOGY

Direct Record Linkage

and

Probabilistic Population Estimation

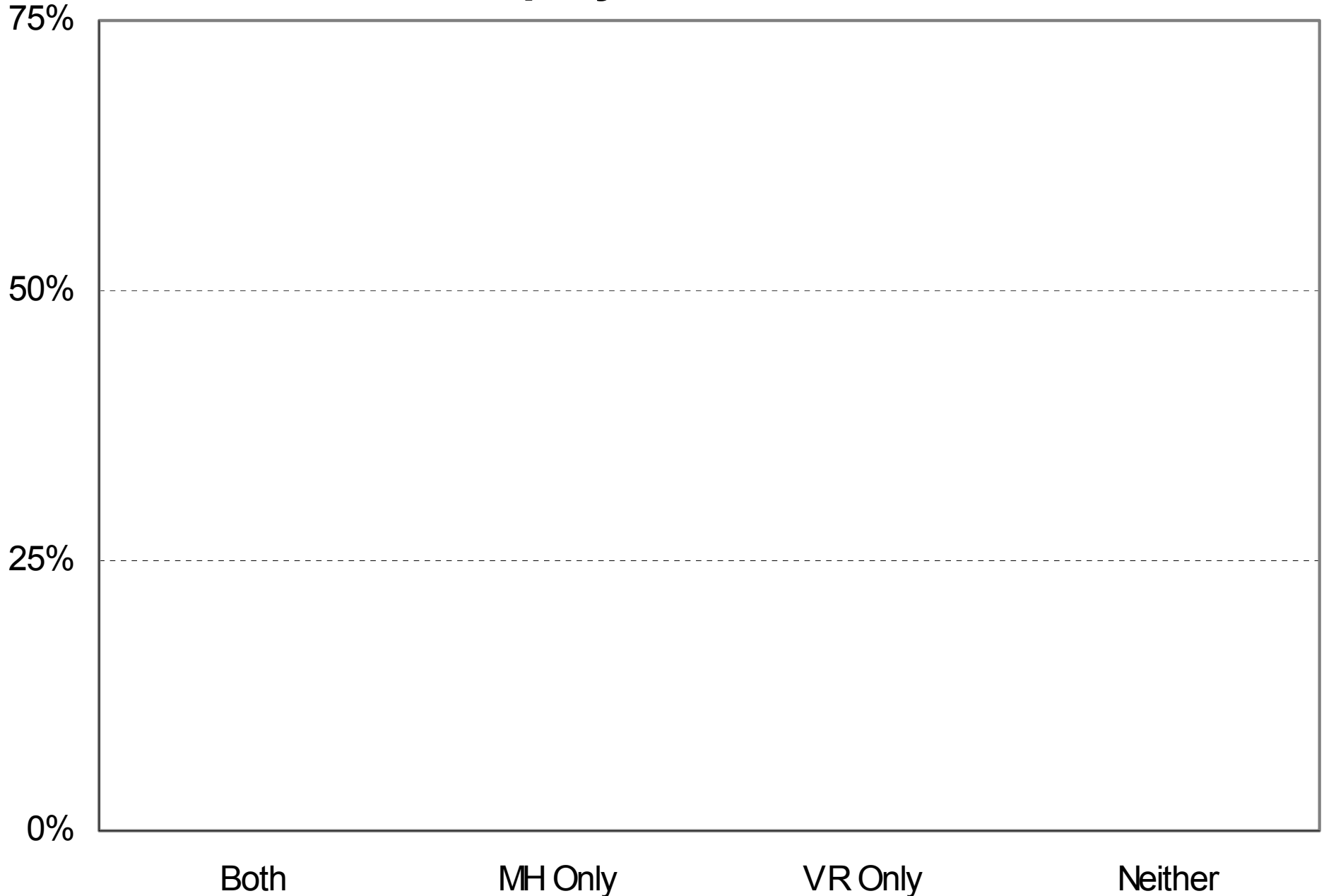
Caseload Overlap



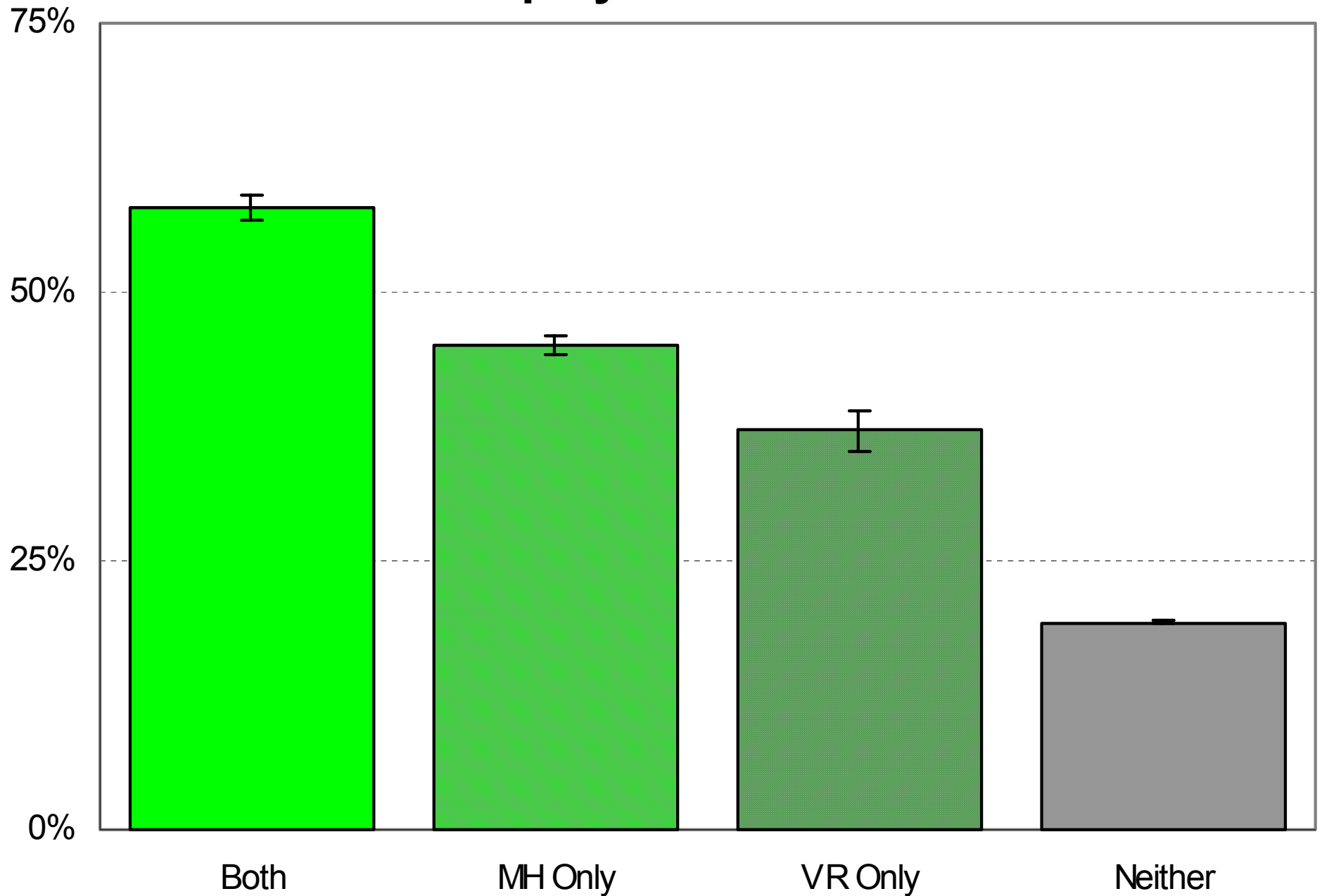
HIPAA Compliant

EMPLOYMENT RATES

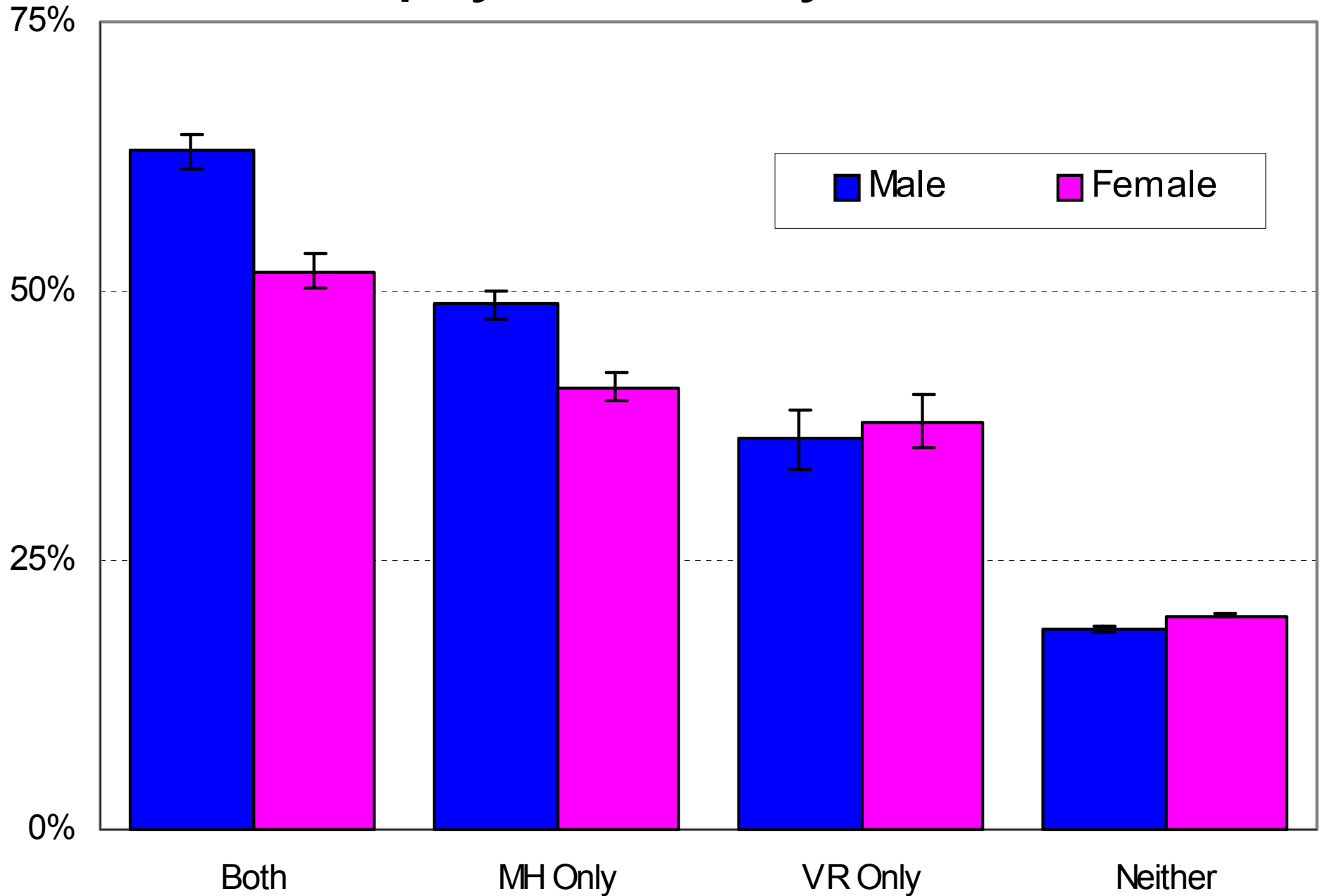
Employment Rates



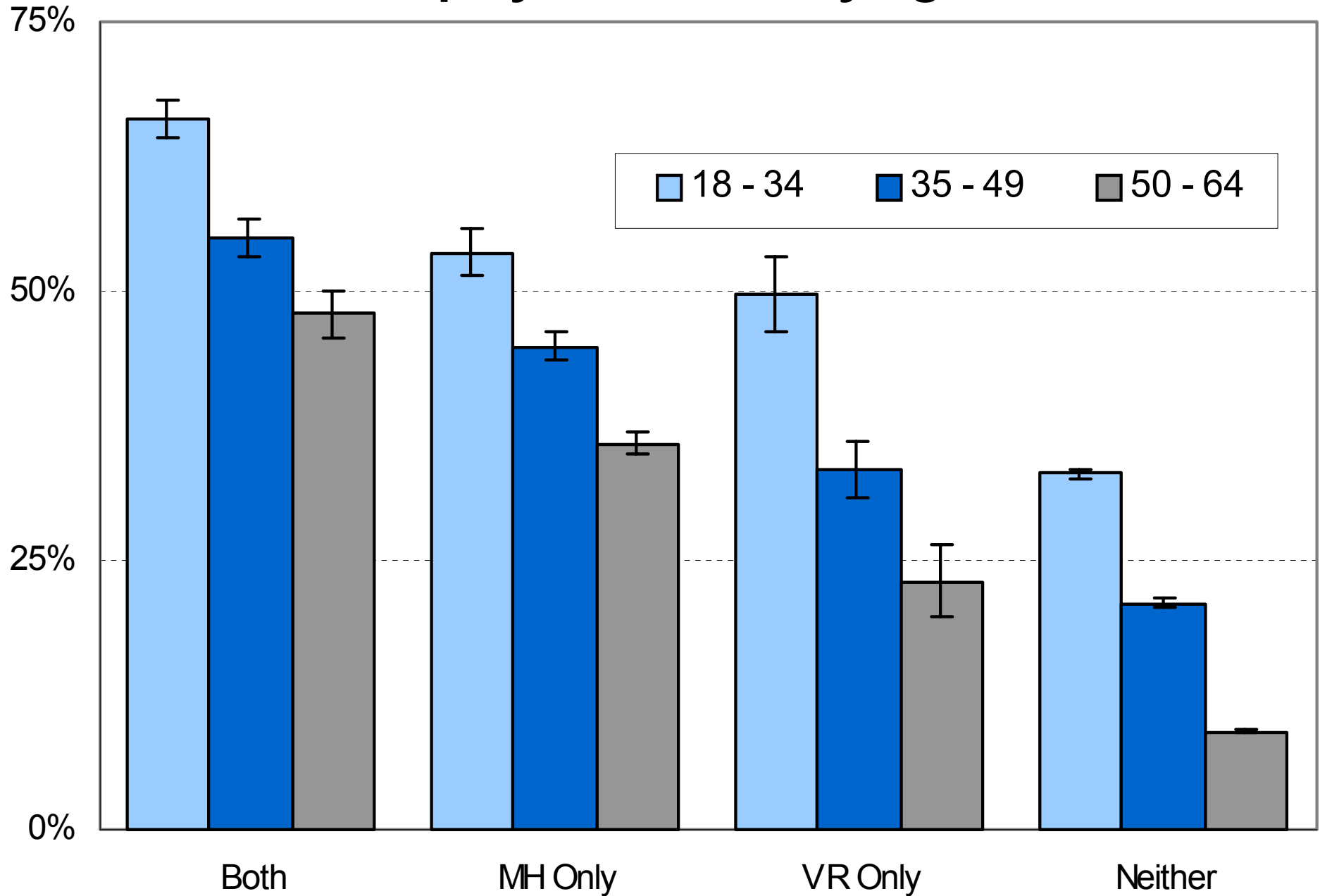
Employment Rates



Employment Rates by Gender



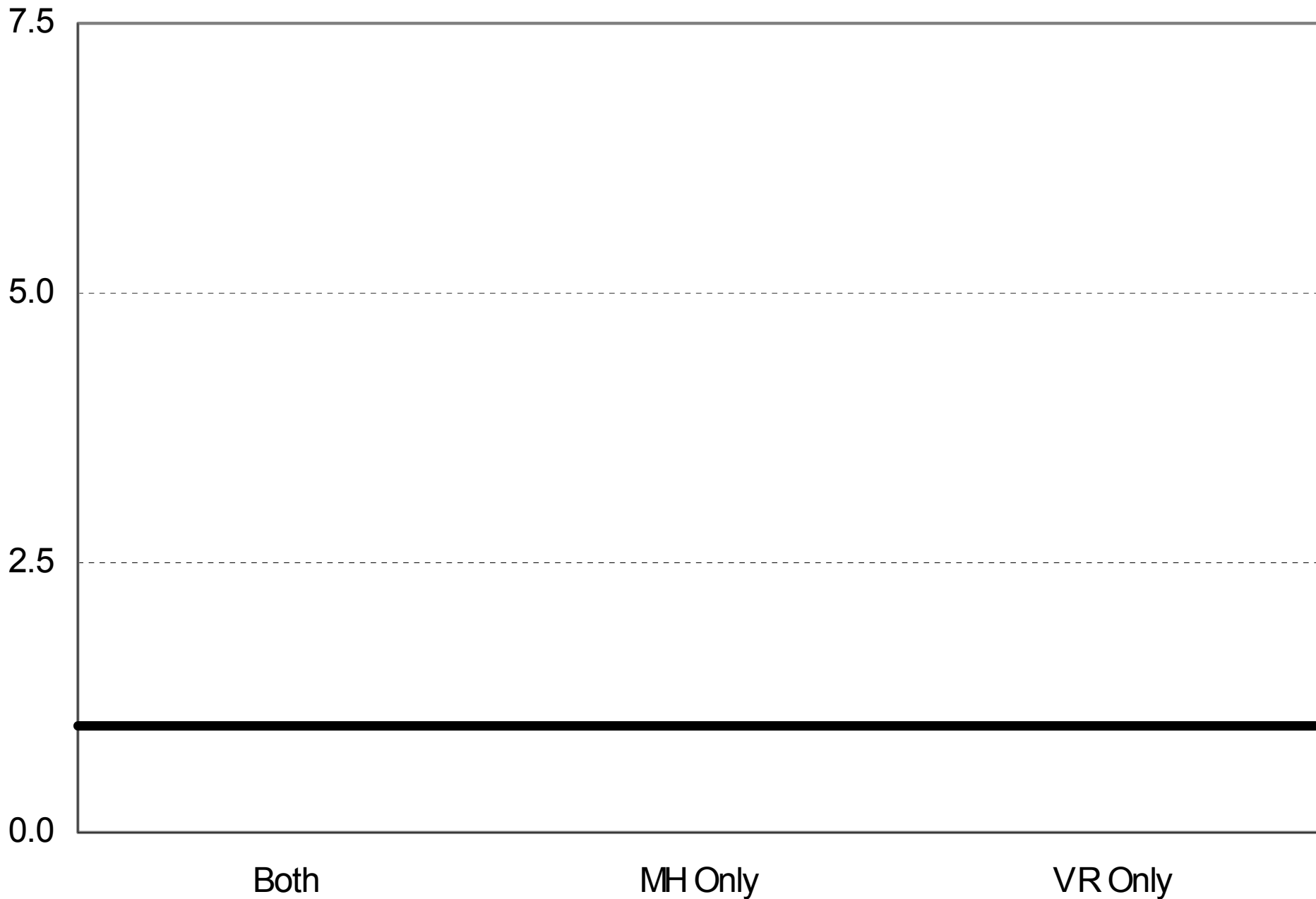
Employment Rates by Age



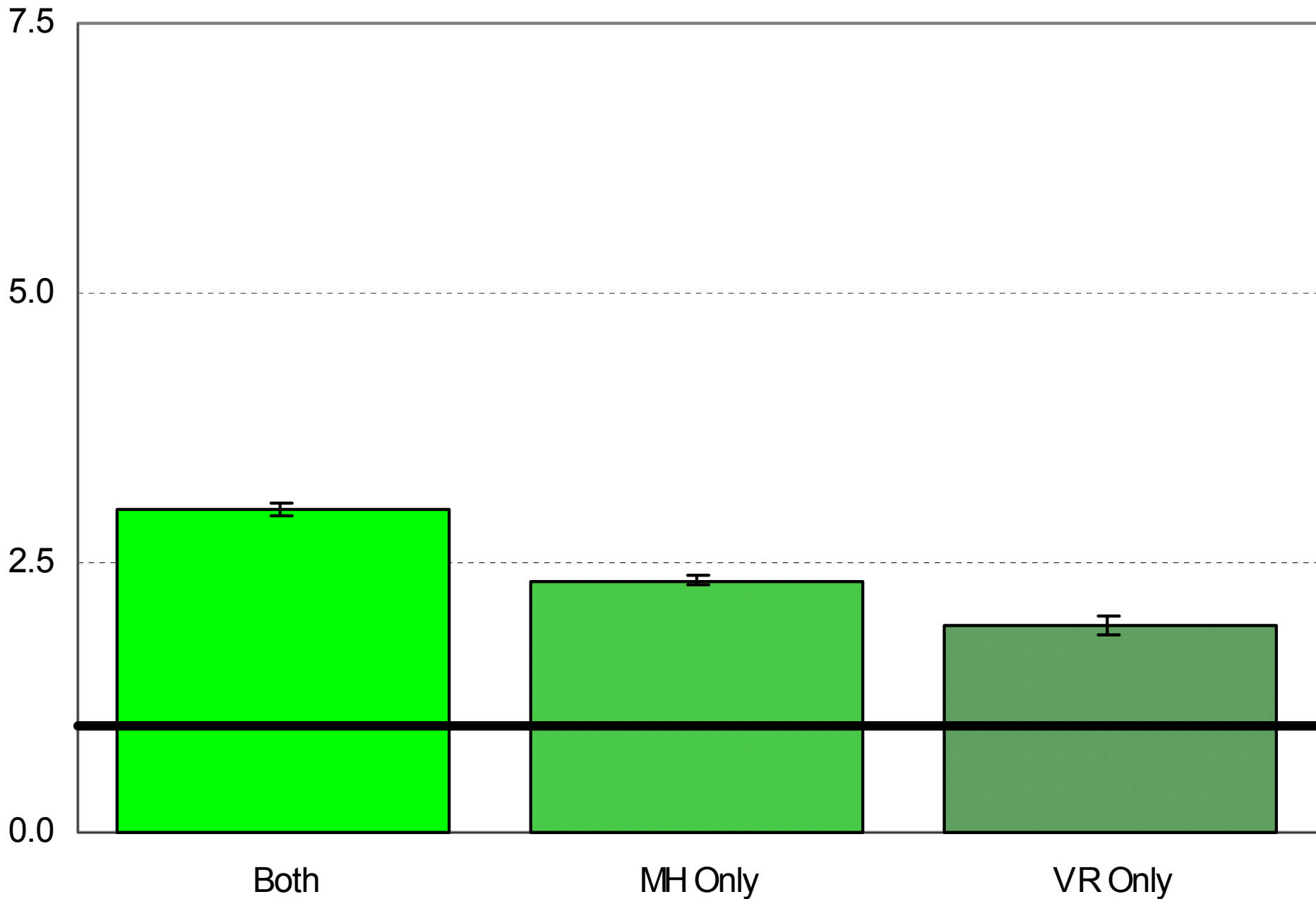
RELATIVE EFFECT

$$R_{(\text{EMP SVCS})} / R_{(\text{NO EMP SVCS})}$$

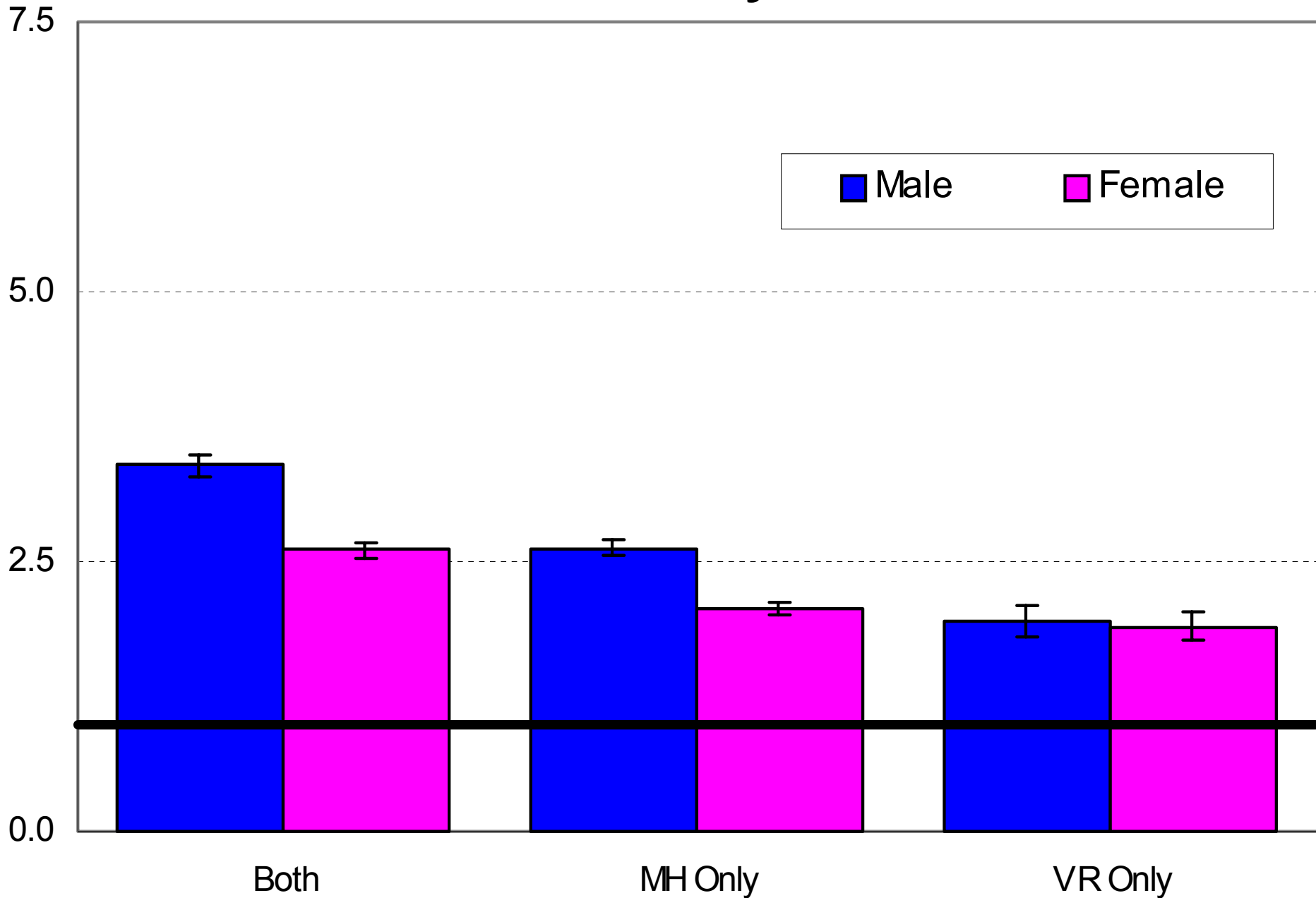
Relative Effect



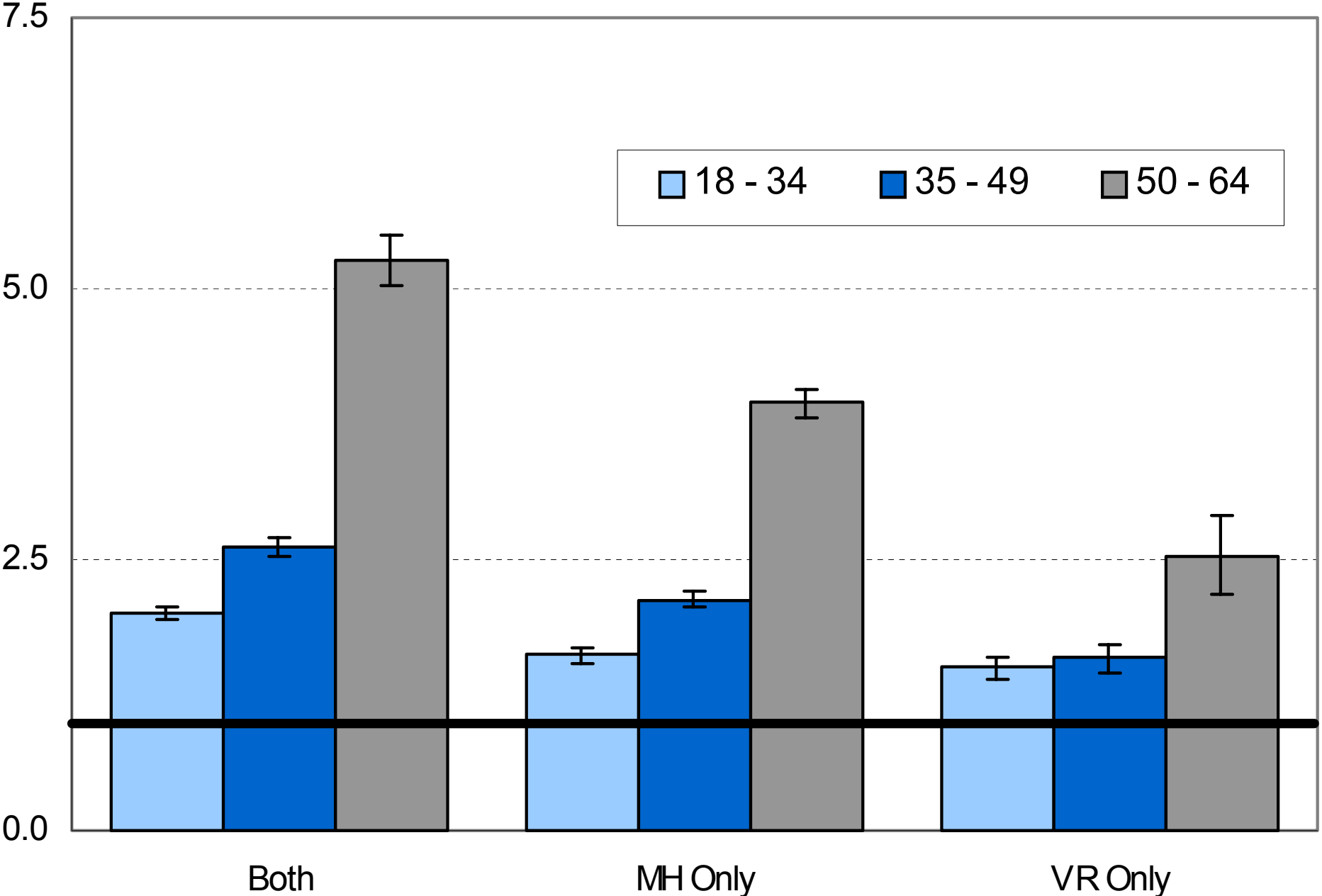
Relative Effect



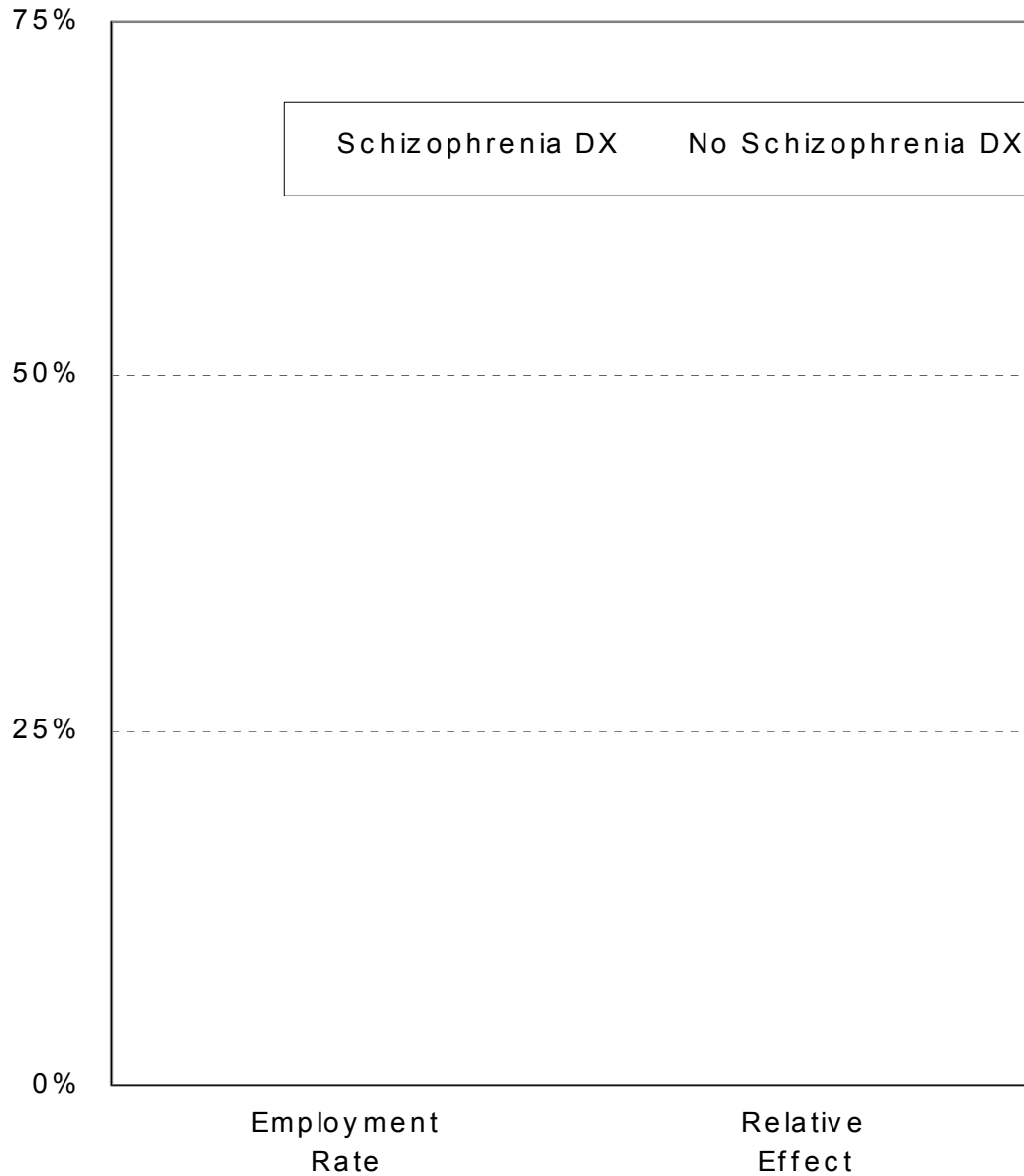
Relative Effect by Gender



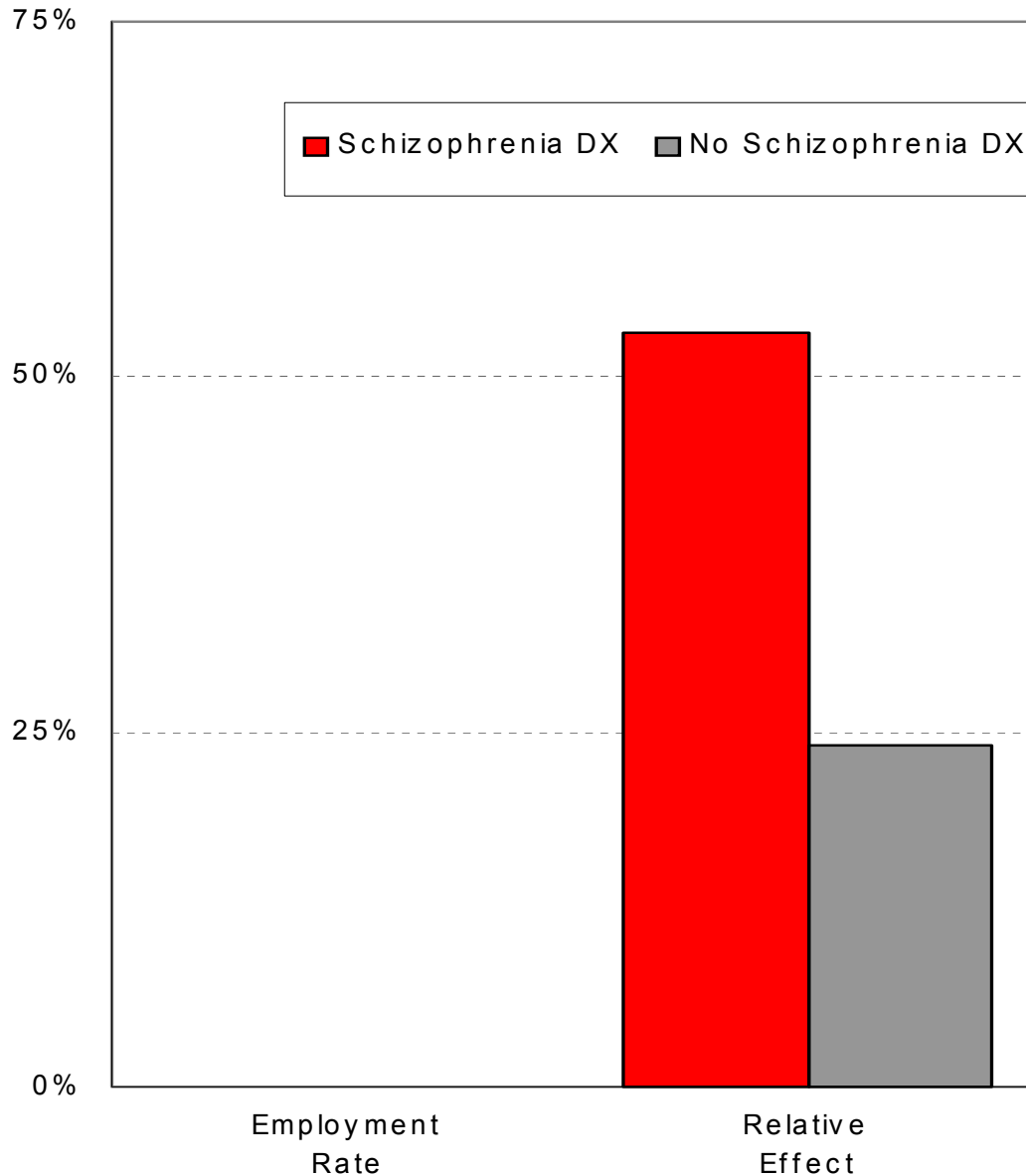
Relative Effect by Age



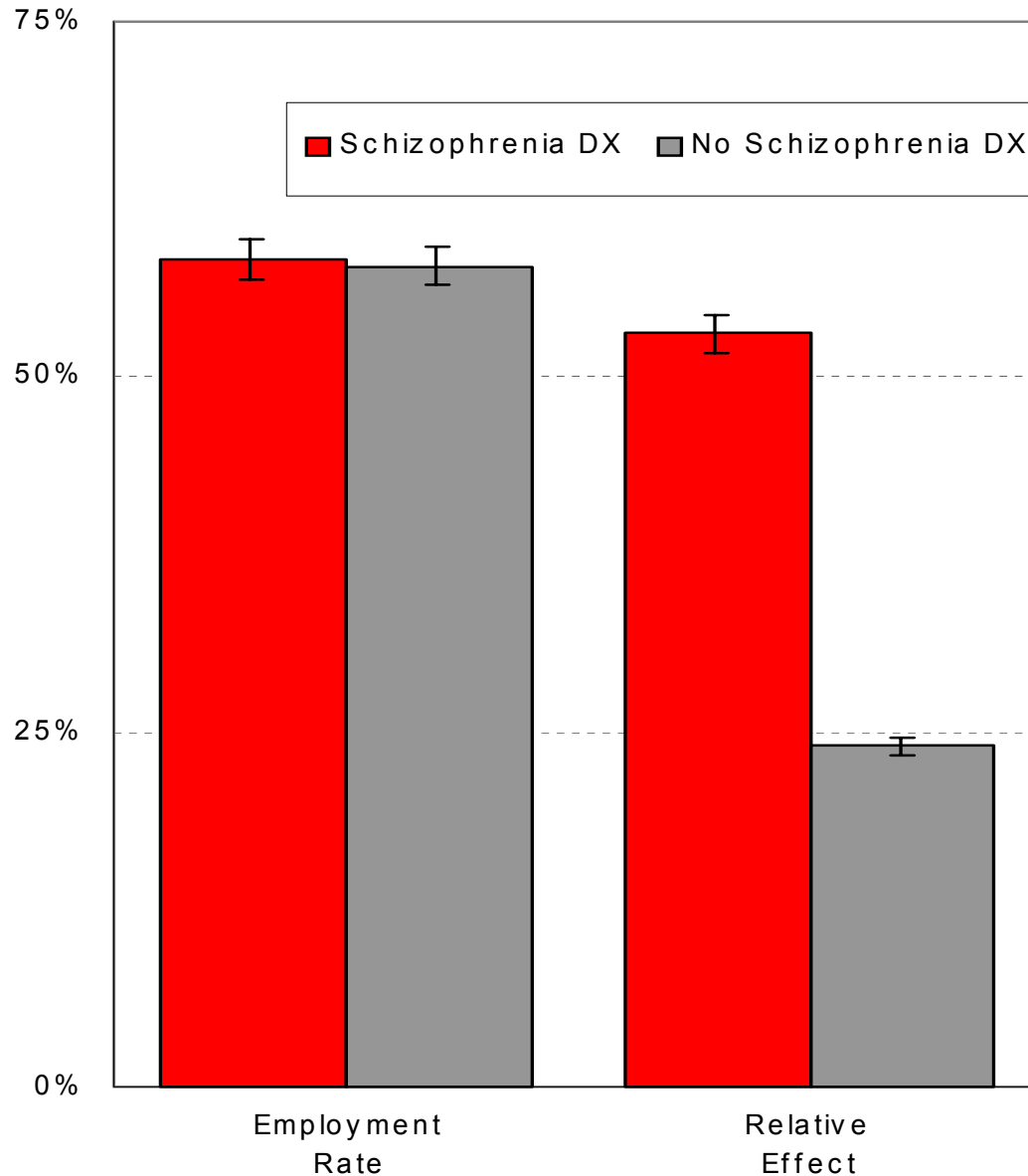
Recipients of Both CMHC and VR Services



Recipients of Both CMHC and VR Services



Recipients of Both CMHC and VR Services



NEXT QUESTIONS

Other Services?

Other Time and Place?

Economic Situation?

Cost Benefit?

SAVE

THE DATA

For More Information:

E-Mail

pip@ddmhs.state.vt.us

Visit

[www.state.vt.us/dmh/Data/PIPs/
pipindexnew.htm](http://www.state.vt.us/dmh/Data/PIPs/pipindexnew.htm)

SAVE

THE DATA