The Journal of Sociology & Social Welfare

Volume 25
Issue 2 *June*

Article 8

May 1998

Estimating Homeless Populations through Structural Equation Modeling

Christopher G. Hudson
Salem State College

Estimating Homeless Populations through Structural Equation Modeling

CHRISTOPHER G. HUDSON
Salem State College
School of Social Work

This article overviews the results from a test of a model of homeless populations throughout the 3,141 counties of the United States. The data were extracted from the 1990 Census, a Census Bureau survey of its enumerators at completion of the census, and other governmental sources. The model was tested using the generally weighted least squares algorithm, as implemented under the Extended LISREL model. It was found that urbanization, servicetization, McKinney funding, and systematic error arising out of more vigilant enumeration efforts in urban areas, collectively explained 80% of the variation in rates of homelessness. The model was then used to correct for enumeration error and to estimate the actual levels of homelessness in both 1990 and 1995. The 1990 estimates were compared with the results of independent estimates for selected localities. After the adjustment for uneven enumeration efforts, the model suggests that a population of 479 thousand homeless persons in 1990, had declined to 383 thousand by 1995.

Estimating Homeless Populations through Structural Equation Modeling

During most of the 1980s research on homelessness was concerned with documenting its severity and describing its victims. This research provided a rich source of findings to lend credence to just about any theory about the origins of homelessness. However, because of the local focus of these studies and a host of methodological limitations, this body of research has raised more questions than have been resolved. Several recent studies (Burt, M., 1992; Elliot, M. & Krivo, L., 1991; Hudson, C.,

1993; Tucker, W. 1987) have involved multi-city or multi-county research designs, and thus have made it possible to explore the impact of differential social and policy conditions on rates of homelessness. The study reported here continues this line of inquiry and is the first to test a predictive causal model with techniques of structural equation modeling, incorporating social, policy, and methodological variables, on data from the full range of the 3,141 U.S. counties.

Methodology

This study is a secondary analysis of data from several governmental and other public data sources. It seeks to both identify and explain the major causal forces which are associated with variations in the size of homeless populations throughout the United States, as well as to use this knowledge in estimating and predicting levels of homelessness. After preliminary statistical preparations of the data, the study uses techniques of structural equation modeling (SEM), specifically the generally weighted least squares (WLS) estimation algorithm, to identify a model with a minimum of predictors. It then tests this model, not only with the standard SEM techniques, but also by generating predictions of sizes of homeless population from the model, adjusting them for systematic error, and then comparing the resulting levels with independent counts and estimates. Counties are used as the unit of analysis in this study as they are usually not so small, with a mean population of 79,182, as to be unduly influenced by the existence of a single homeless shelter or so large that important variations would be camouflaged. The decision to model the national distribution rather than just that in cities or in particular regions was based on a need to assess the extent of what is widely believed to be a substantial urban bias in the Census homeless counts. Furthermore, there is insufficient variation in key policy variables, such as deinstitutionalization, when multiple states are not included.

An extensive process of model formulation, testing, and respecification resulted in two final models, one with 36 predictors which was useful for explanatory purposes (see Hudson, C., 1998), and a trimmed model with 4 variables which is reported

in this article. The second model reported here is based on the hypothesis that urbanization, when combined with servicetization, involving the expansion of the service-based portion of the economy, as well as the extent of services targeted toward the homeless, will substantially account for variations in existing homeless populations, even after differential levels of enumeration effort and random measurement error are controlled for.

The number of homeless persons for each county was obtained from an extract of the U.S. Bureau of the Census 1990 STF-2C tape series, based on the results of the Census Bureau's S-Night enumeration of homeless persons in March of 1990. The Census' figures included the numbers for each county for homeless individuals broken down type of location, sex, age, race, and sex by race. The primary measure of homelessness analyzed was the sum of the homeless individuals enumerated divided by the corrected 1990 population counts for each of the 3,141 counties in the 50 states and the District of Columbia, and then scaled as a rate per 10,000 population. The reliability of the homeless counts has been controversial. The Coalition for the Homeless first identified a probable undercount, especially in rural areas, and of the street homeless. Most observers have agreed, however, that the count of the sheltered homeless produced useful figures. These issues are reviewed in depth elsewhere (Hudson, C. 1993; 1998).

The four predictor variables in the trimmed model are as follows: (i) Urbanization was measured by the proxy variable, population density (1990 population per square mile) (computed from U.S. Bureau of the Census, STF1-C, 1990); (ii) Servicetization, or the percentage of all employed persons who hold jobs in the services job sector (computed from U.S., Bureau of the Census, *USA Counties*, 1990); (iii) McKinney (federal expenditures for the homeless) expenditures per homeless person (computed from Interagency Council on the Homeless, 1992); and, (iv) Extent of differential search effort or systematic error, as indicated by the number of sites to which S-Night enumerators were deployed, per 10,000 population (U.S. Bureau of the Census, unpublished). This final measure was selected only after an analysis of statistics on procedures used in the S-Night enumeration effort, obtained through the Freedom of Information Act.

Results

After an overview of the descriptive statistics generated from the unadjusted S-Night data, the trimmed model will be presented, followed by a presentation of the adjusted 1990 figures and finally, the 1995 estimates.

S-Night Counts. In March of 1990 the U.S. Bureau of the Census located 240,140 homeless persons, representing a rate of 9.7 for each 10,000 Americans. About one out of five (20.7%) of these people were located through the street count, and most of the remaining (70.1%) were enumerated in homeless shelters. The remaining tenth of this population (9.2%) was almost equally divided between shelters for runaways (4.3%) and for battered women (4.9%). Over two-thirds of the total (68.8%) were males, about equally divided between minorities and mon-minorities. Similarly, half (50.6%) of the total were persons of color. Close to a fifth (18.9%) of the total homeless were 17 or younger, with this group found in battered women's (47.7% of youth) and runaway (82.3%) shelters, and only 4.9% found on the street. The remaining four-fifths were just about equally divided between the 18 to 34 age category (39.2%) and the 35 or over group (41.9%).

Variations in risk for homelessness throughout the various segments of American society can be examined through group-specific rates (see table 1). These involve dividing subgroups of the homeless population by the corresponding segment of an area's or the nation's population. Children have a slightly lower rate of homelessness (7.5 per 10,000) than that of the general population (9.7). In contrast, the 18 to 34 age group has a rate of 12.9, but this drops to 8.8 for the 35 and over population. Males have over twice the rate (13.7) as females (5.8). This disparity, however, is not fully reflected in the county-level zero-order correlation of .12 between the percent of males and the homeless rate. Even more noteworthy, is the fact that minorities of color have over three times the rate (21.9) as do non-minorities (6.5), a correlation of .42 ($\alpha < .01$) on the county level. This disparity is consistently replicated in further breakdowns for the four types of settings. The rate can also be broken down by gender, revealing that the 21.9 rate presents a combination of 14.6 for minority females and 29.5—almost a third of a percent—for minority males. In

contrast, 9.3 per 10,000 white males were homeless, and 3.7 white females.

Rates of homelessness also vary dramatically between levels of urbanization, whether defined by population density, county population size, or percent of population that is in an urbanized area. Rural areas have a 2.9 rate, whereas counties with over five million population have a rate of 18.0. These rates, in part, represent the more vigilant search efforts conducted in the largest urban areas. The differential rates among the gender, age, and racial groups are fairly consistent throughout urban and rural counties. One exception is a slight sex-urbanization interaction—

Table 1

Rates of Homelessness for Selected Groups, By Type of Site (Per 10,000)

	Homeless Shelters	*Shelters for Runaways*	*Visible on Street*	*Battered Women's Shelters*	*Total*
AGE					
0–17	4.9	1.4	0.4	0.9	7.5
18–34	8.7	0.2	3.3	0.6	12.9
35+	6.7	0.2	1.9	0.2	8.8
GENDER					
Male	9.8	0.5	3.2	0.2	13.7
Female	3.9	0.4	0.8	0.7	5.8
RACE-GENDER					
White Male	6.6	0.3	2.3	0.3	9.3
White Female	2.4	0.3	0.6	0.5	3.7
Minority Male	21.7	1.2	5.8	0.8	29.5
Minority Female	9.9	0.9	1.6	2.2	14.6
RACE					
White	4.5	0.3	1.4	0.4	6.5
Minority	15.7	1.1	3.7	0.9	21.9
TOTAL	6.8	0.4	2.0	0.5	9.7

Notes: Rates are computed based on total population in designated group, i.e. 7.5 rate for 0–17 year olds means that there are 7.5 homeless 0–17 year olds for each 10,000 persons of this same age group.

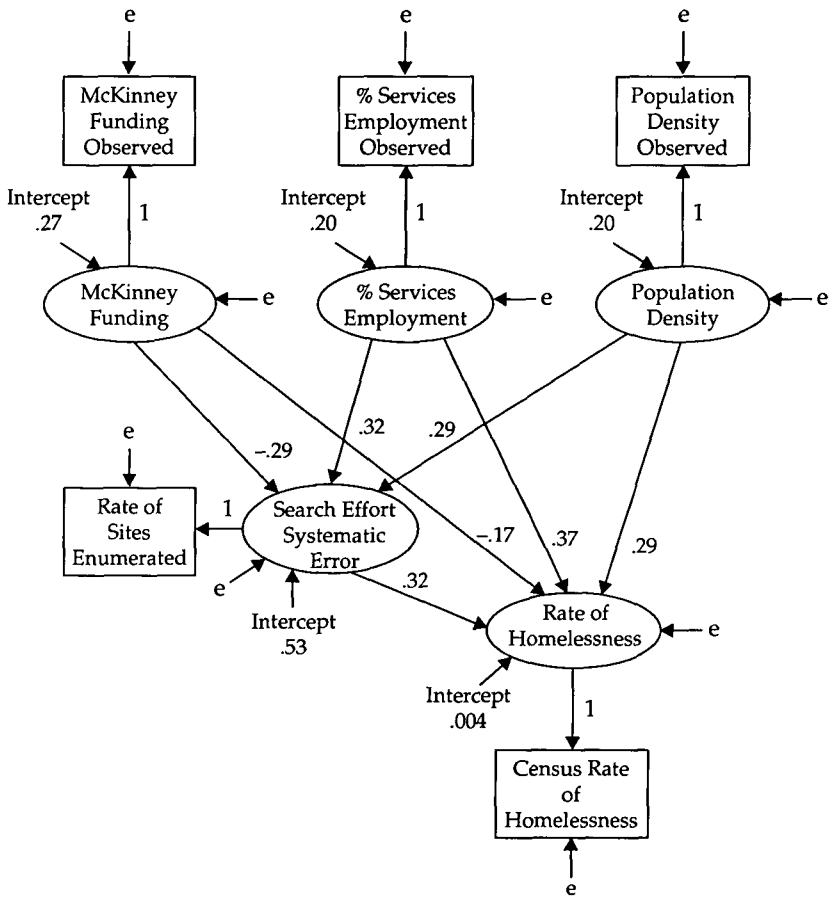
Source: Computed from 1990 U.S. Census (STF-2C Data Tape).

the disparity between the male and female rates is greatest in the mostly urbanized areas. Similarly, the disparity between minorities and non-minority groups grows from a odds ratio of 3.4 (9.1 vs. 2.7) in rural areas to 3.7 (35.8 vs. 9.8) in the largest urban counties. The total zero-order correlation between the homeless rates and population density is .43 ($\alpha < .01$), reflecting the same impact of urban conditions.

The Trimmed Model. One of the final steps in model development is the pruning of all variables which do not add meaningfully to the model. What this process resulted in is a dramatically simplified model which consisted of only three predictor variables—density, service sector employment, and McKinney funding—and one methodological variable, rate of sites enumerated, and these collectively accounted for about 80% of the variation ($R^2 = .799$) in the homeless rates. This is a model which incorporates not only the systematic error, as represented by rate of sites visited, but also random error. In addition, it used information regarding the means of each of the variables so as to enable the computation of figures referred to as intercepts, which are required for any projections made from the model. This final, trimmed model was developed by selecting the most important predictors, based on preliminary analysis, and then by further reducing them one at a time until all remaining predictors and specified relationships were significant.

Figure 1 presents the conceptual structure of the resulting model. It is based not only on the premise that each of the variables is an imperfect representation of a latent variable or concept it is intended to measure, but also that systematic error—the differential search effort—both influences what is eventually found, and in turn, is influenced by the demographic and economic conditions of the various parts of the nation. Differential search efforts, in and of themselves, are an insufficient basis to conclude systematic error since the Census Bureau may have had good reason to believe more homeless people would be found at given locations, and thus, justified in assigning more sites and staff to certain locales. For that reason, it was assumed necessary to control for the same kinds of conditions, such as urbanization or history of homeless programs, that the Census Bureau would

Figure 1
The Trimmed Model of Homelessness



Notes: Paths are labelled with standardized regression coefficients, whereas intercepts are not standardized. Error terms were fixed, based on the following estimates of error: Homeless rate, 10%; site rate, 2%; density, 1%; services employment, 5%. See table 2 for indices of goodness of fit and other statistics.

have had data on and possibly used in assigning staff. Whether or not these particular variables were used by the Bureau, is not critical; these variables would be expected to be correlated with those actually used by the Bureau. Inquiries were made of the

Census Bureau about the actual formula used for these decisions, but the Bureau declined to divulge this information. Thus, paths were tested for each of the predictors of the search effort variables, and each of these was confirmed to be important. Controls for such conditions, do indeed explain some of the differential search efforts. However, the variation in these efforts is not entirely explained, as the correlations with the results of the Census are reduced, but not eliminated. In addition, tests were made for the possibility of a two-way relationship between the homeless and the enumeration rates, and though significant, in the end the specification only served to weaken the model. It was based on the premise that informal and preliminary reports on the actual levels of homelessness served to influence the search effort, for example, through a preliminary survey that the Census Bureau conducted to locate likely sites where homeless persons could be found. This possibility was also tested through preliminary correlations with the rate of response to the preliminary survey, and while the bivariate analyses indicated an effect, it quickly disappears when multivariate controls are used.

In the final model, the single most critical predictor variable was the proportion of the county's population employed in the services sector of the economy, and this accounted for over a quarter (25.5%) of the variation in the homeless rates; for each standard unit change in percentage of services employment, there was about two-fifths (β = .37) unit change in the homeless rate. Why services employment would be so deleterious for the homeless is not entirely clear, but since service positions usually require at least a high school diploma, and whether professional or semi-skilled, contact with the public, it is clear that persons with little education and those with behavioral disabilities will be especially affected. Likewise, according to Census Bureau surveys these positions are disproportionately filled through temporary means, commonly referred to as "temping". The resulting instability and competitiveness of the marginal employment market, no doubt, represent particularly detrimental conditions for those with minimal educational preparation, a group also beset with substantial levels of disability. Almost a quarter (23.4%) of those with less than an eighth grade education have a severe disability, whereas this percentage drops consistently as county rates of education

increase, with only 1.3% of those with 16 or more years of school having a severe work disability (computed from U.S. Census, STF3C, 1990). This represents a strong zero-order correlation of .77 ($\alpha <$ .000). Similar patterns can be found in the examination of individual-level data (Taeber, C., 1991, p. 224). In addition, those employed in the services sector have a substantially above average rate of mental disability (computed from U.S., D.H.H.S., 1993).

That population density, a key indicator of urbanization, should be the second most important predictor, accounting for almost a fifth (18.2%) of the variation in the homeless rates, should come as no surprise (β = .29). Much of the public's experience of the homeless comes from the streets of major cities such as New York, Washington, DC, and San Francisco. For each standard unit change in population density, there was almost a third (29%) unit change in the level of homelessness. We now can say with some confidence that the much higher rates of homelessness found in urban areas are not merely a reflection of the nominal search efforts conducted by the Census Bureau in rural areas. Indeed, part of the differential rates and the resulting correlation are explained away through such statistical controls, but not entirely. It is clear that something about the most highly urbanized areas directly contributes to homelessness. The preliminary analyses suggested that minorities, young adults, men, and single people are most at risk, especially those with minimal education and family ties. Whether it is the increasing stratification, anomie, or economic competitiveness, it is apparent that many from these groups become singled out and ultimately excluded from whatever communities they might have initially been part of. A missing ingredient, for which it has not been not possible to statistically model, may be cultural changes which take place above a given population density threshold, ones which emphasize independence, meritocracy, survival of the fittest, and a sharp distinction between the deserving and undeserving poor.

Together urbanization and servicetization account for more than two-fifths (43.7%) of the variation in homeless rates, suggesting that this combination of conditions is particularly dangerous for the populations identified earlier—minorities, men, young adults, uneducated, and single people. The one variable in the

model for which it is possible to impact on is the level of McKinney funding, and this accounted for just over a tenth (10.4%) of the variations in homelessness in the predicted direction: For each standard unit increase in funding, there was a decrease of about a sixth in a standard unit of the rate of homelessness ($\beta = -.17$). Unfortunately, it was not possible to identify which of the many McKinney programs which has made the most difference, but it may be the continued support for transitional programs to move homeless from shelters, as well as adaptations in mainstream programs, which may be making a difference.

Finally, it should be noted that just over a quarter (25.7%) of the variation in homeless rates can be accounted for by the fact that the Census Bureau looked harder some places than others for homeless persons, even after the rational component of this differential search effort is taken into account ($\beta = .32$). And specifically, the model supports the conclusion that the Census Bureau looked a lot less in sparse rural areas than the data would justify. Many of these were no doubt areas for which the Bureau did not get a response back from their preliminary planning survey, or for which the responding officials did not know of any likely sites for enumerators to visit. In future efforts, considerably more care will be needed in these preliminary planning efforts to base the deployment of enumerators on statistical studies such as this one, with provisions for substantial variations from the predicted levels. A majority of the problems identified in the S-Night ultimately involved too many sites and homeless persons for too few enumerators.

Model Fitting and Testing. The trimmed model fits the data quite well, explaining about 80% of the variation in the homeless rates. Of the 10 indices of goodness of fit examined, only one suggested a lack of fit, and that was the Chi-square probability level of .000, indicating a very high probability that the sample and model implied covariance matrices did not come from the same population. However, it is generally agreed that such probability levels are only appropriate for samples up to 300 to 500, and that beyond this level, true models will often be inappropriately rejected (see Hu, L. & Bentler, P., 1995, p. 81; Hayduk, L., 1987, p. 168). This interpretation is supported by the fact that most

of the other indices, such as the AGFI and CFI, which correct for sample size, strongly support the acceptance of the model. Alternatively, the same model was tested, as recommended by Hayduk, with a sample size specified as 200, and this resulted in a highly significant ($\alpha < .05$) probability level for the Chi-square (see Hayduk, 1987, p. 168). The model was also cross-validated using the ECVI index which permits a comparison of the ability of two similar models to pass the split-half cross validation test, and this was found to be .02, smaller than that of the prior models for which this index could be computed (see table 2).

An examination of residuals permits identifying particular areas where the model fits or fails to fit the data. The first type of residual examined were those representing the differences between the sample covariances and the those implied by the model, some of which are set to zero. An average of these differences is reflected by the standardized root mean square residual which is only .068, well within acceptable limits. The median was .0091, with the residuals ranging from −.005 to .172.

A final test of the model involved a comparison of rates from the model, after enumeration error is adjusted for, with the results of independently conducted estimates and studies from the same period. Instead of using the observed rate of enumerators, the adjusted estimates are based on the assumption that had the Census Bureau deployed enumerators to sufficient sites such that there would be no evidence of enumeration error, they would have obtained more accurate counts. This level is a type of saturation point where additional search efforts would not make any difference in the results, and this was computed from the data to be at the level of 2.9 sites for each 10,000 persons. This saturation rate was calculated using elementary differential calculus, by setting the deriviative to zero, and solving for site rate, and then visually confirming it by inspection of a scatterplot with the regression curve included. Estimates from entering the 2.9 figure into the model and recomputing the predicted rates are summarized in table 3, in the column "Adjusted Model Estimate".[1] A comparison of the independent and adjusted model rates suggests considerable variation, but nonetheless confirms that impression given by the residuals. When sub-national areas are considered, there is considerable variation characterized by possible over-prediction

Table 2

WLS Regression Coefficients and Goodness of Fit Indices for Reduced Model of Homelessness

	Unstandardized		*Standardized*		
Predictor	*Direct*	*Indirect*	*Direct*	*Indirect*	*Total*
Population Density	0.06	0.02	0.29	0.09	0.38
Percentage Employment in Services	0.38	0.10	0.37	0.10	0.48
McKinney Funding	−0.10	−0.06	−0.17	−0.09	−0.26
Rate of Enumeration Sites per 10,000	0.04	—	0.32	—	0.32
INDICES OF GOODNESS OF FIT					
Chi-square, with 3 degrees of freedom			26.0, p=.000		
Root mean square error of approximation (RMSEA)			.062		
Expected Cross Validation Index (ECVI, Saturated Model: .00955; Independence Model: 7.107)			.020		
Standardized Root Mean Square Residual			.068		
Goodness of Fit (GFI)			.988		
Adjusted Goodness of Fit (AGFI)			.910		
Parsimony GFI (PGFI)			.132		
Stability Index (SI)			.002		
Comparative Fit Index (CFI)			.999		
R^2 for Rate of Homelessness			.800		

Notes: All direct and indirect effects are highly significant, below the .01 level.

in the rural areas and under-prediction in the urban areas. The last part of table 3 compares national estimates with those generated by the model. With the exception of the Census Bureau's 240 thousand figure, all the other figures range from 324 to 735 thousand, all revolving around the 479 thousand predicted by the model, after adjustment for enumeration error. This research, thus, supports and strengthens previous estimates of approximately a half million persons who were literally homeless in 1990. It should be noted that each of the independent studies and

estimates were based on different definitions of homelessness and methodologies, and for this reason alone it would be expected that there would be considerable variation around any actual rate as this study has attempted to estimate.

1995 Model Projections. One of the advantages of modeling social problems such as homelessness is that updated estimates can be obtained by entering current data, and recomputing the predicted values from the model. For this reason, updated population estimates were obtained for each county for 1995. In addition, projections of services employment were computed, based on 1979 and 1989 data, and although 1995 McKinney expenditure amounts were not available for each state, a total was available. State estimates for the proportion for 1995 were based on 1992 and 1993 data, applied to the 1995 total. Finally, the 2.9 site enumeration rate was also used as a correction for the inadequate enumeration efforts made by the Census Bureau in most areas of the nation. While population and services employment continued to rise during this five year period, they did so only nominally, thus their effect would not be expected to be dramatic. At the same time, there were dramatic increases in McKinney Funding, from a total of $581 million in 1989 to $1.495 billion in 1995 (Interagency Council for the Homeless, 9/92, p. 38 & telephone contact), a 157% increase; thus, clear declines in homelessness might be expected during this period. In fact, the model projects 383,079 homeless persons in 1995, a decline of 20% in the five years, from 478,993 in 1990. This decline parallels that estimated by Jenck for the 1987/1988 to 1990 period, from 402,000 to 324,000, also about 20% (1994, p. 17), as well as an analysis of 1987 to 1992 shelter data in Massachusetts.

Discussion. This study reveals that contemporary homelessness has resulted largely from a convergence of urbanization with the restructuring of the economy, in particular, with the growth of the services sector, an outcome of the continuing globalization of economic activity. In addition, it provides evidence that the expansion of targeted funding for services for the homeless through the McKinney program, more than mainstream service and income programs, has provided a powerful antidote for homelessness, possibly reducing it by 20 percent between 1990 and 1995. It also

Table 3

Comparison of Census, Independent, and Model Estimates of Homeless Populations in Selected Jurisdictions

Jurisdiction	*Census Count*	*Independent Estimate*	*Adjusted Model Estimate*	*Year*	*Type of Study*
COUNTIES					
California counties[1] (Alameda, Orange, Yolo)	4,144	1,601–1,730	8,162	1987	Community Survey
Los Angeles County[2]	12,631	38,420–68,670	20,659	1990	Community Survey
Ohio rural counties (n=21)[3]	177	919	1,575	1990	Community Survey
Tennessee counties (n=7)[4] (urban and semi-rural)	2,119	2,597	4,675	1985–1989	Community Surveys
STATES					
Colorado[5]	3,114	5,500	6,279		Estimate
Florida[6]	10,900	2,200	25,690		Aggregation of Estimates
Illinois[7]	9,272	29,216	22,950	1989	
Massachusetts[8]	6,207	10,000	13,400	1990	Administrative Statistics
Oregon[9]	4,069	10,000	5,184	1987	

continued

Table 3, *continued*

Jurisdiction	*Census Count*	*Independent Estimate*	*Adjusted Model Estimate*	*Year*	*Type of Study*
Tennessee[10]	2,451	3,203	8,210	1986	
Texas[11]	10,520	41,833	29,306	1985	Aggregation of Estimates
Utah[12]	1,250	1,700	3,191	1985	Key Informants Survey
Virginia[13]	3,161	64,592	11,186	1986	
Washington[14]	5,634	6,000	8,379	1987	
NATION	240,140		478,993		
Burt, M.[14]		496,000–600,000		1987	Aggregation of Local Surveys
Jencks, C.[15]		324,000		1994	
National Alliance to End Homelessness[16]		735,000		1988	Reanalysis of 1984 HUD Study
U.S. Department of Housing & Urban Development[17]		500,000–600,000		1988	Reassessment of 1984 Study

Note: Whenever a range was given in the state and county estimates, the mid-point was used. The above are counts of persons in both shelters and in street locations.

continued

Table 3, *continued*

Sources:

[1] Burnam, M. A. (March 1991). Estimation of the number of homeless and mentally ill persons in three California counties. In, Tauber, C. (ed.). *Conference Proceedings for Enumerating Homeless Persons: Methods and Data Needs*. U.S. Bureau of the Census.

[2] Shelter Partnership, Inc. (May 1992). *The number of homeless people in Los Angeles City and County, July 1990 to June 1991.*

[3] First, R. Draft report of NIMH Ohio rural study. Table 3.2.

[4] Lee, B. Homelessness in Tennessee, p. 181, in Momeni, J. (ed.). (1990). *Homelessness in the United States: State Surveys*. New York: Praeger.

[5] *Comprehensive Homeless Assistance Plan, 1987*, cited in Momeni, J. (ed.) *Homelessness in The United States.*

[6] Kovisto, in Momeni, J. (ed.). In, Momeni, J. (ed.). *Homelessness in The United States*, p. 63.

[7] Timmer & Knotterus. In, Momeni, J. (ed.). *Homelessness in The United States*. p. 55.

[8] Executive Office of Human Services, Commonwealth of Massachusetts. (1990). *Comprehensive Homeless Assistance Plan 3, Winter 1991–1992.*

[9] Banzer. (1987). Cites U.S. Conference of Mayors (1986a). In Momeni, J. (ed.). *Homelessness in the United States.*

[10] This projection for the state is less than that for the subset of counties since a number of counties had negative projections. Lee, Barrett, Homelessness in Tennessee, in Momeni, J. (ed.). *Homelessness in The United States.*

[11] Baker, S.G. and D.A. Snow. Homelessness in Texas: Estimates of Population Size and Demographic Composition. In, Momeni, J. (ed.). *Homelessness in the United States.*

[12] Maurin, J. and L.S. Russell. (1987). Homelessness in Utah: Utah Homeless Survey Final Report. Salt Lake City Utah: The Task For Force for Appropriate Treatment of the Homeless Mentally Ill (Unpublished Report).

[13] Bromlesy, B.B., D. M. Johnson, D. Hartman, and A. L. Ruffin. Homelessness in Virginia: Dimensions of the Problem and the Public Reaction. In, Momeni, J. (ed.). *Homelessness in the United States.*

[14] Burt, M. R. Developing the estimate of 500,000–600,000 homeless people in the United States in 1987. In, Tauber, C., (eds.). (March 1991). *Conference Proceedings for Enumeration Homeless Persons: Methods and Data Needs*. Bureau of the Census.

[15] Jencks, C. (1994). *The Homeless*. Cambridge, MA: Harvard University Press.

[16] National Alliance to End Homelessness, cited in Institute of Medicine. (1988). *Homelessness, Health, and Human Needs*, Washington DC: Academic Press, pp. 3–4.

[17] Robert P. (March 1, 1988). Data are elusive on the homeless. *New York Times.*

reveals that, even after the tendency of the Census Bureau to visit more sites in urban areas is considered, the disparity of rates between urban and rural areas persists, though to a less dramatic degree. Although homelessness in the United States is first and foremost an urban problem, its existence in rural areas has been routinely minimized and ignored.

Many explanations might be offered as to the role of urbanization and servicetization in the origins of homelessness. Several have already been advanced here: that the services sector does, in fact, require higher educational credentials, it provides little job stability due to the high rates of "temping", or that higher than average rates of mental illness may be a factor. The former explanations may be the more probable, as the high rates of mental illness may be in part an outcome of low education and job instability. Deindustrialization, *per se*, was found to have almost no correlation with servicetization, and to have only a slight impact on homeless levels. It may be that layed off industrial workers who relocated in distant counties displace many of those in the low-end of the services sector, causing a ripple effect, leading some of these people to become homeless. In fact, when the homeless have been previously employed, they have been employed more often in the services sector than in manufacturing. Ropers, for instance, found that in a Los Angeles sample, 26.6% of the homeless had been service workers, while 22.7% had been laborers; 15.6%, operatives; 14.8% technicians or professionals; 10.2%, craftspersons; 7.8%; and 1.6%, from farm labor (1988).

Other explanations for the impact of urbanization and servicetization are suggested by the preliminary descriptive analyses of the homeless data reported earlier. These indicate that those at greatest risk of homelessness are minorites, males, young adults, and urban dwellers. And, perhaps most pertinent, is the tendency of minorities and males to be at greatest risk in urban areas. These findings suggest that such groups, especially those in multiple jeopardy such as young black adult males, are most adversely affected by the combined conditions of the large urban areas with economies in which jobs are shifting to the services sector. The interaction of racism with intensifying social stratification, instability, and anomie appears to be particularly virulent, especially for those with marginal educational preparation and work histories.

Perhaps some of the most significant findings of this study involve the many variables which did not contribute sufficiently to be included in the trimmed model reported here. These include indicators of individual disabilities, family fragmentation, problems in mainstream service coverage, including the deinstitutionalization of mental health services; and housing unaffordability. While each of these areas was found to explain some of the variation in homeless rates, those which contributed the least consisted of individual disabilities and mainstream social services. These conditions, however, have not been the focus of this article; their analysis and a full discussion of their implications are reported elsewhere (Hudson, C., 1998, in press).

One of the most important findings of this study is that it is not only feasible to adjust census data using known sources of variation and bias to produce synthetic estimates, which can in turn be confirmed or disconfirmed. Both astronomers and criminologists have been effective in predicting the existence of unobserved but later-to-be verified phenomena by using the flimsiest of data, the most disreputable of informants, or the most abstract theoretical conjectures as their starting point which are then subjected to error correction methodologies and critical analysis. The ability of social scientists to productively use the so-called "fatally flawed" data from the Census to study the dimensions of homelessness should not be an insurmountable task. This attempt to do so has met with a moderate degree of success, but one which will require refinement of its methodologies and replication.

References

Burt, M. E. (1992). *Over The Edge.* New York: Sage Foundation.

Elliot, M. and L. J. Krivo. (Feb. 1991). Structural determinants of homelessness in the United States, *Social Problems, 38* (1).

Hayduk, LA. (1987). *Structural Equation Modeling with LISREL: Essentials and Advances.* Baltimore: John Hopkins Press.

Hu, L. and P. M. Bentler. (1995). Chapter 5, Evaluating model fit, in R. H. Hoyle (ed.). (1995). *Structural Equation Modeling: concepts, Issues, Applications.* Thousand Oaks, CA: Sage Publications.

Hudson, C. G. (1993). The homeless of Massachusetts: An analysis of the 1990 U.S. Census S-Night data, *New England Journal of Public Policy, 9* (1).

Hudson, C. G. (1998, in press). *The Dynamics of Social Disintegration: An Interdependency Model of Homelessness.* Lewiston, NY: Edwin Mellen Press.

Jencks, C. (1994). *The Homeless*. Cambridge, MA: Harvard University Press.
National Coalition for the Homeless. (May 9, 1991). *Fatally Flawed: The Census Bureau's Count of Homeless Persons*, Washington, DC: National Cooalition for the Homeless.
Roper, R. H. (1988). *The Invisible Homeless: A New Urban Ecology*. New York: Human Sciences Press.
Taeber, C. (ed.). (1991). *Statistical Handbook on Women in America*, Phoenix, AZ: The Oryx Press.
Tucker, W. (Sept. 25, 1987). Where do the homeless come from? *National Review*.
U.S., Bureau of the Census. (1990). *USA Counties* (CD-ROM).
U.S., Bureau of the Census. (unpublished tables sent to author).
U.S., Bureau of the Census. (1990). *Standard Tape File 1C* (STF-1C).
U.S., Bureau of the Census. (1990). *Standard Tape File 3C* (STF-3C).
U.S., Department of Health and Human Services. (Sept., 1993). *1989 National Health Interview Survey* (CD-ROM), Series 10, No. 3.
U.S., Interagency Council on the Homeless. (Sept. 1992). *Federal Progress Toward Ending Homelessness: The 1991/1992 Annual Report*, Washington, DC.

Notes

1. The algorithm used to compute this was (in SPSS syntax):

```
if (siterate lt 2.9)homadj=((.3782*empser89)+(.0600*(density*.01))
        -(.1023*(mckinhom*.0001))+(.0439*2.9)+.0043)*100.
if (siterate ge 2.9)homadj=((.3782*empser89)+(.0600*(density*.01))
        -(.1023*(mckinhom*.0001))+(.0439*siterate)+.0043)*100.
```

KEY: siterate=Rate of sites enumerators visited; homadj=Adjusted homless rate, per 10,000; empser89=% Working in services sector; density=Population density; mckinhom=Rate of McKinney spending

NOTE: .01, .0001, and 100 figures were for rescaling data after scale had been changed by LISREL8 program. ".0043" is the intercept term.