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As is the case with most evaluations of welfare reform, it is difficult to separate the effects of welfare reform and Philadelphia's economy during the study period. To test the effect of Act 35's implementation while controlling for economic factors, a multivariate regression analysis of family shelter admissions was conducted along with variables for the unemployment rate and for the consumer price index for the cost of rental housing. This analysis revealed a significant positive effect of unemployment and housing costs on public shelter admissions among families and no effect of the implementation of welfare reform.

Keywords
public shelters, child welfare, preventive services, welfare reform, unemployment

Comments
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The use of public shelters in Philadelphia was examined both before and after the implementation of Act 35, Pennsylvania's response to the Personal Responsibility and Work Opportunity Reconciliation Act of 1996. Univariate interrupted time-series analyses were conducted to determine if trends in shelter utilization (the number of families admitted, by family size, by race, by age of household head, by income, by disability indicator, and by average length of stay) changed significantly after March 1997, the month in which Act 35 was implemented, or after 3, 6, 9, and 12 months of implementation. Results indicate that family size and household head age increased after the implementation of Temporary Assistance for Needy Families, although not at consistent lags. A small negative effect on self-reported substance abuse and a small positive effect on the proportion of household heads with a disability were found, but at inconsistent lags.

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Background

Welfare Reform in Philadelphia

The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), which was passed by Congress in August 1996, replaced the Aid to Families with Dependent Children (AFDC) program with Temporary Assistance for Needy Families (TANF), thereby eliminating the federal government's guarantee of assistance to dependent children and implementing a program that emphasized the employment of parents with dependent children. PRWORA also changed the distribution of funds from an unlimited match of state expenditures for AFDC to block grants that require states to contribute a specified portion of TANF expenditures.

Although this new method gives states more flexibility in how they spend federal funds, PRWORA requires states to ensure that a stipulated percentage of the TANF caseload is working, to enforce a 2-year limit on the amount of time allowed for finding work, and to enforce a 5-year lifetime limit on the receipt of TANF funds. States are allowed to exempt a maximum of 20 percent of their TANF caseload from the 5-year limit.

Within this framework, in March 1997 Pennsylvania passed a welfare reform law, Act 35, which specified how it would implement PRWORA. Act 35 requires every person enrolled in TANF to complete an "agreement of mutual responsibility" (AMR) that commits them to look diligently for employment. As soon as the AMR is completed, the enrollee must begin an 8-month job search and, in compliance with PRWORA, be engaged in an "approved work activity" by the end of 2 years. After 2 years of TANF receipt, the enrollee must be working at least 20 hours a week, and education or training cannot be included as part of these 20 hours. All persons are subject to PRWORA's 5-year lifetime limit on TANF receipt, even if a person leaves the TANF caseload and later returns.

Act 35 exempts caretakers who are not receiving TANF, which usually includes grandparents or other caretakers with their own income, from the work requirements. Mothers with children under 1 year of age or with children under 6 who cannot find childcare are also exempt, as are caretakers who are unable to work because of physical or mental handicaps.

Before the implementation of Act 35, sanctions applied only to the head of household; other members of the household could continue to receive welfare benefits. If the TANF requirements are not met, Act 35 outlines sanctions that may ultimately result in the denial of benefits to an entire household. The first violation that occurs within the first 24 months of TANF receipt may result in the suspension of benefits for 30 days, and the second violation may result in a 60-day suspension. A third violation that occurs within the first 24 months of TANF receipt may result in the permanent loss of benefits for the entire household.

However, through the end of 2001, only seven households in Philadelphia County had been permanently expelled from the TANF program since the implementation of Act 35.[1] Thus any studies of the effects of welfare reform in Philadelphia are unlikely to find effects directly associated with the imposition of time limits and sanctions. However, indirect, aggregate effects associated with declining TANF participation rates, such as increases in requests for emergency shelter, may be observable and are tested here.

Welfare Reform and Homelessness

Few studies have measured the effect of welfare reform on homelessness. Berger and Tremblay (1999) suggest that persons receiving TANF are especially vulnerable to homelessness because an estimated 80 percent of them are not receiving housing assistance. Berger and Tremblay also cite a study by Salomon, Bassuk, and Brooks (1996) that found that women in a Massachusetts shelter were more likely to receive AFDC than low-income women who were housed, which suggests that the shelter residents are more likely to be affected by welfare reform. On the basis of the experience of states that had experimented with work requirements before the passage of PRWORA, Berger and Tremblay expected TANF terminations to be widespread, although that expectation has not been realized in Pennsylvania.

Some localities have observed increases in the number of people sheltered after the implementation of PRWORA. The University of Massachusetts at Boston research team (Friedman et al., 2001) reports that the number of persons using shelters in Massachusetts, which has enforced a 2-year time limit, increased from 2,900 to 4,300 between 1995 and 2000; the authors attribute that increase to the effects of welfare reform. In Milwaukee, where sanctions have also been applied and reductions in TANF benefits imposed, shelter providers also reported an increase in demand (Huston, 1999). Conversely, in its 2000 annual survey of 25 cities throughout the United States, the U.S. Conference of Mayors (2000) did not find an exceptional increase in the demand for emergency shelter after the passage of PRWORA in 1996. However, in each of these cases, changes in shelter demand were assessed based on the impressions or reports of shelter providers and public officials, not analyses of actual client utilization data.

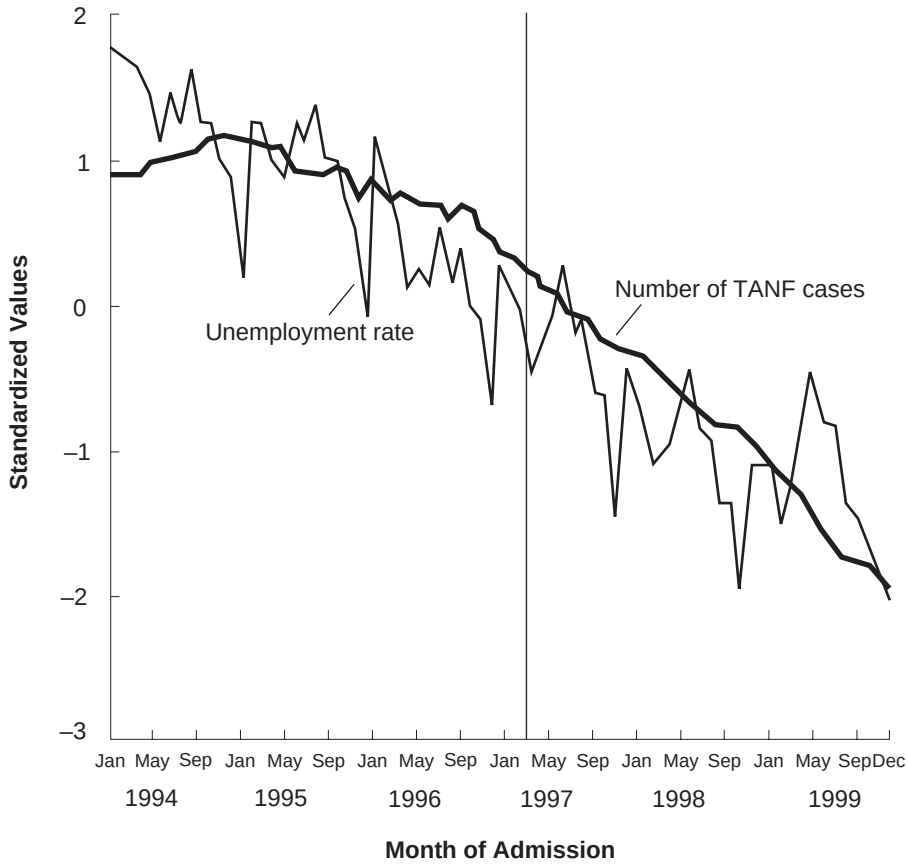
Beyond the expectation that the number of families seeking shelter would rise after welfare reform, there has been little speculation about the impact of welfare reform on the shelter utilization patterns of families. Previous research found, however, that characteristics of individuals and families are associated with entry, exit, and stay patterns (Culhane and Kuhn, 1998; Wong, 1997; and Wong, Culhane, and Kuhn, 1997). Those same characteristics were included here to explore whether the shelter caseload changes that may occur as a result of welfare reform were associated with changes in the characteristics of sheltered households in the aggregate.

There are at least four reasons why the impact of welfare reform on homelessness has not been consistently measured—or has been difficult to interpret even when measured. First, most cities and states do not have information systems that track changes in demand for emergency shelter services over time.[2] Second, most local and national estimates of homelessness are based on shelter census figures, which vary by locality for various reasons independent of the demand for services, including capacity limitations and shelter policies that govern eligibility and length of stay (LOS).

Third, welfare changes may *indirectly* affect the risk for homelessness as much if not more than directly affecting that risk, and indirect effects are inherently more difficult to measure. For example, one possibility is that, to the degree that caseloads decline and people who previously would have applied for welfare no longer do so (either due to perceived disincentives for receipt or perceived ineligibility), more such households may be at risk of homelessness. Such effects are infrequently measured in welfare reform research, because most evaluations track cohorts of recipients, not nonrecipients.

Exhibit 1

Trend in Number of TANF Recipients and Unemployment Rate in Philadelphia, 1994–99



TANF = Temporary Assistance for Needy Families.

Sources: Personal communication, Dennis Putze, director of the Division of Statistical Analysis, Pennsylvania Department of Public Welfare; and U.S. Department of Labor, 2001, Bureau of Labor Statistics, Series LAUSM61600003.

Fourth, although caseloads may have declined following TANF implementation and may therefore be expected to be associated with increases in the risk for homelessness, other factors, such as the extant economy, will play a mediating role. This is evident in exhibit 1, which superimposes the trend for the unemployment rate in Philadelphia over the trend for the TANF caseload. As the exhibit clearly illustrates, these trends have an extraordinarily strong association between 1994 and 1999, with a correlation coefficient of .89 ($P < .001$). Thus even when trends in shelter admissions or welfare caseloads are accurately measured, they cannot be directly interpreted without statistical controls for changes in the economic environment that may mediate any effects.

Methods

Data

We evaluated the effects of welfare reform on Philadelphia's shelters using data collected by Philadelphia's Office of Emergency Shelter and Services (OESS). OESS, the central agency for managing emergency services for the homeless, spends more than $30 million annually on a continuum of services that enable homeless individuals and families to become self-sufficient and obtain permanent homes. As part of these services, OESS either operates or contracts with providers to maintain a network of shelters and transitional housing facilities for families, couples, and single adults. The OESS shelter system does not include a separately administered network of domestic violence shelters, although victims of domestic violence will frequently stay in OESS shelters while awaiting placement in a domestic violence shelter.

In 1990 OESS began maintaining a centralized mainframe database that collects and stores data on those using OESS-funded shelter services. According to the best estimates, this database covers approximately 85 percent of shelter beds citywide. The database, used for administrative, case management, and fiscal accounting purposes, functions as a comprehensive and cumulative record of all households (both single adults and families) staying in an OESS-funded shelter. The database was expanded in 1992 to include stay history information for all shelter episodes.

Univariate Interrupted Time-Series Analysis

Time-series data were generated to assess trends in shelter utilization before and after the passage of Act 35 in Pennsylvania. Data were aggregated by month for all families admitted to public shelters and for all variables in the shelter records deemed to have a possible relationship to welfare reform, including the following:

- Number of families.
- Average size of families.
- Average age of heads of household.
- Percentage of African-American heads of household.
- Percentage of Hispanic heads of household.
- Percentage of White heads of household.
- Percentage of other race heads of household.
- Percentage of heads of household with no income.
- Percentage of heads of household receiving TANF.
- Percentage of heads of household identified by OESS staff as mentally ill or mentally retarded.
- Percentage of heads of household identified by OESS staff as substance abusers.
- Percentage of heads of household identified by OESS staff as physically disabled.
- Average LOS (exit defined by 1 day out of shelter).
- Average LOS (exit defined by 30 days out of shelter).

The statistical significance of the effects of Act 35 on trends in shelter admissions and stays were assessed using interrupted time-series analysis. This method is used to evaluate the sudden and sustained effect of an event over time by using a dichotomous variable coded 0 for times before the event and 1 for times after the event in a regression model. This technique controls for the autocorrelation inherent in time-series data using a moving-average procedure and can also be used to control for preexisting trends and seasonality. Once such adjustments are made, the effects of the dichotomous variable representing the event can be assessed.

In this study, all of the variables were tested for seasonality by employing one set of dummy codes representing months of the year and another set representing quarterly periods. The effects of welfare reform were initially evaluated in March 1997, when Act 35 was implemented; lagged effects were also tested at 3 months, 6 months, 9 months, and 1 year after March 1997. Each of these effects was represented by a dichotomous variable with a value of 1 beginning at the lagged periods.

To illustrate the statistically significant effects found, the time-series data were entered into a statistical software program (SPSS) and transformed through a process known as T4253H smoothing.[3] This process reduces the amplitude of random shocks typical of time-series data, making visual representations of the data easier to interpret. In addition, a reference line was added to each graph at the March 1997 mark to distinguish between the pre- and post-Act 35 periods.

Multivariate Analysis of Related Trends

The existence of possible relationships between TANF caseload and homelessness was further explored by fitting a series of multivariate regression models that included variables measuring changes in the extant economy. In this case, both family shelter admissions and admissions among single women without accompanying children were tested. Rates of exit were also tested as an alternative approach to assessing the effect of welfare reform on length of stay, avoiding the right-censoring problem inherent in a time-series measure for average LOS.

A series of four ordinary least-squares regression models were fitted. The four dependent variables were each a series of monthly measures (either of admissions or exits) for the period January 1994 through December 2000 (for families or single women without children). These time-series data were adjusted for seasonal fluctuations using the U.S. Bureau of the Census's X-11 method.[4] In addition, to ensure stationarity and normal distributions among these variables, the first difference of the logged value of these values was used so that the dependent variables became a measure of the rate of change from month to month over this time series.

The principal covariate of interest in this model was the TANF caseload, also measured in monthly intervals between January 1994 and December 2000. The TANF caseload represents the number of families receiving TANF assistance in Philadelphia by month. In addition to this covariate, two monthly measures of more general economic dynamics were also included in the model as controls: the consumer price index (CPI) for rental units in Philadelphia and the unemployment rate in Philadelphia. As with the dependent variables, these covariates were seasonally adjusted using the X-11 method, and the logged first difference of the monthly values was used.

The final covariate values were also lagged by 1 month to take into account a brief lag in the effects of economic changes and changes in homeless admissions and exits. Also included in the model was a dichotomous variable that indicated whether or not each particular time point occurred before or after the implementation of Act 35. Finally, two autoregression terms are included to control for the autocorrelation that typically exists among time-series measures.

Results

Interrupted Time-Series Analysis

The results of the interrupted time-series analysis are summarized in exhibit 2, and significant results are displayed graphically in exhibits 3 through 6. Very few significant effects were found, and these did not occur at a consistent lag. Family size and age were both found to be positively and significantly associated with welfare reform, although at different lags from TANF implementation.

A statistically significant shift toward increasing family size occurred 3 months after TANF implementation, whereas the shift in the age of the household head registered significance only 1 year later. A significant decrease in the proportion of shelter admissions reporting substance abuse problems occurred at a 1-year lag. A significant positive effect of TANF implementation on the proportion of shelter admissions with disabilities was found concurrent with implementation of TANF.

Multivariate Analysis of Related Trends

The results of the regressions are shown in exhibit 7. Only the positive effect of unemployment rate on shelter admissions is significant ($P < .01$), and the positive effect of the CPI is marginally significant ($P < .10$). Such relationships are intuitive, because shelter admissions can be thought to increase as rents and unemployment increase. These significant effects are not shown in any of the other three models.

Furthermore, neither welfare measure (caseloads or TANF implementation date) was found to have a significant effect in any of the four models. This lack of significant effect for the caseload covariate persisted as other models were fitted that employed different lag periods and omitted the control variables to further test the effect of caseload on shelter admissions. In none of these instances was the caseload covariate found to have a significant relationship with any of the shelter admissions or exit measures. Thus although some evidence exists of relationships between family shelter admissions and two of the control covariates—the unemployment rate and the CPI for housing costs—the results from this analysis fail to support the existence of any significant relationship between TANF caseload dynamics and admissions to and exits from the shelter system.

Conclusions

On the basis of a visual inspection of the trend lines for shelter admissions, some changes appear to have occurred in the number and characteristics of families seeking shelter after the implementation of Act 35. However, interrupted time-series analyses, with varying lags specified up to a year after TANF implementation, reveal that only a few of these effects are statistically significant. The average family size and the average age of the household head both significantly increased, at 3-month and 1-year lags,

Exhibit 2

Impact of Act 35 on Characteristics of Families Admitted Into Philadelphia Shelters, January 1994–December 1999

Variable	Act 35	6/97 Lag 1	9/97 Lag 2	12/97 Lag 3	3/98 Lag 4
Families	NS	NS	NS	NS	NS
Family size	NS	$P < .01$, +	NS	NS	NS
Age	NS	NS	NS	NS	$P < .001$, +
Percentage of population					
African American	NS	NS	NS	NS	NS
Hispanic	NS	NS	NS	NS	NS
White	NS	NS	NS	NS	NS
No income	NS	NS	NS	NS	NS
TANF	NS	NS	NS	NS	NS
MHMR	NS	NS	NS	NS	NS
Substance abuser	NS	NS	NS	NS	$P < .001$, –
Disabled	$P < .01$, +	NS	NS	NS	NS
LOS 1 day	NS	NS	NS	NS	NS
LOS 30 days	NS	NS	NS	NS	NS

TANF = Temporary Assistance for Needy Families; MHMR = mental health/mental retardation; LOS = length of stay; NS = not significant; + = direct association; – = inverse association.
Note: Results of interrupted time-series analysis.

respectively. The proximity of the family size effect to TANF implementation suggests that this effect may be real, indicating that larger families had a comparatively more difficult time finding and maintaining housing after TANF implementation, presumably because they were less able to take advantage of work and training opportunities compared with families with fewer children and fewer daycare responsibilities.

Exhibit 3

Average Family Size of Families Admitted to Public Shelters in Philadelphia, 1994–99

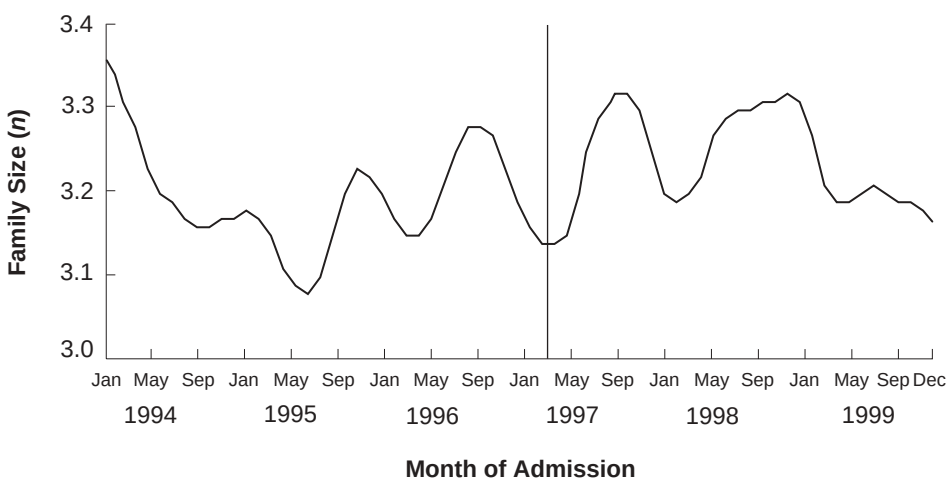


Exhibit 4

Average Age of Family Household Heads Admitted to Public Shelters in Philadelphia, 1994–99

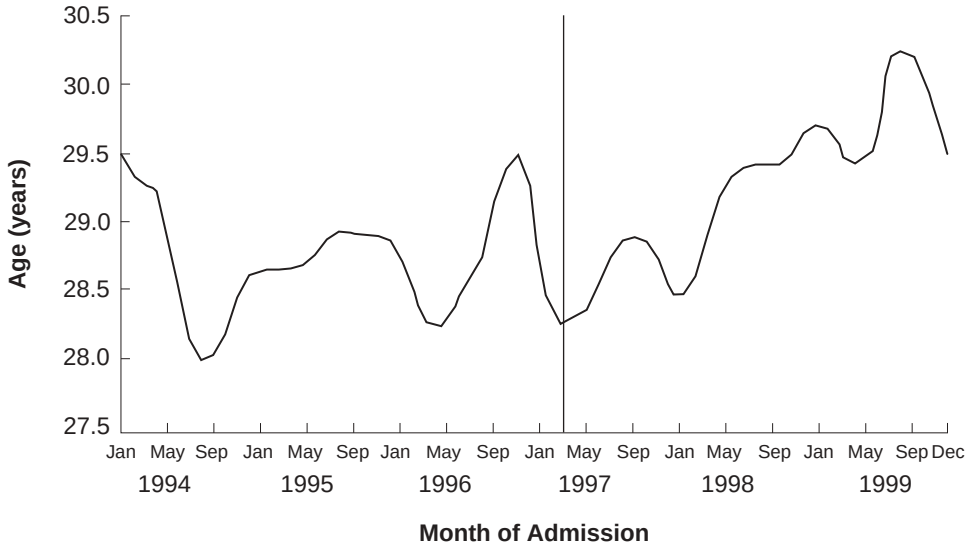


Exhibit 5

Percentage of Self-Reported Substance Abuse Among Family Household Heads Admitted to Public Shelters in Philadelphia, 1994–99

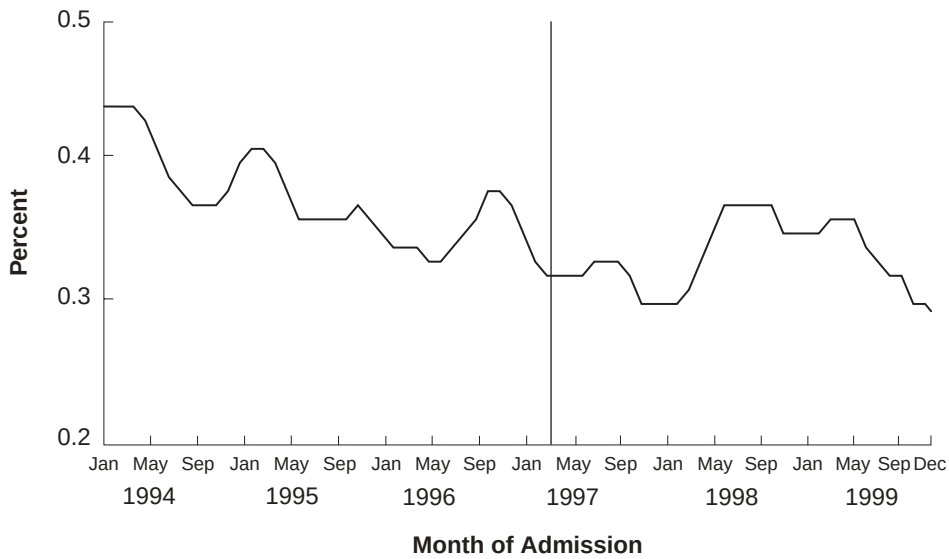
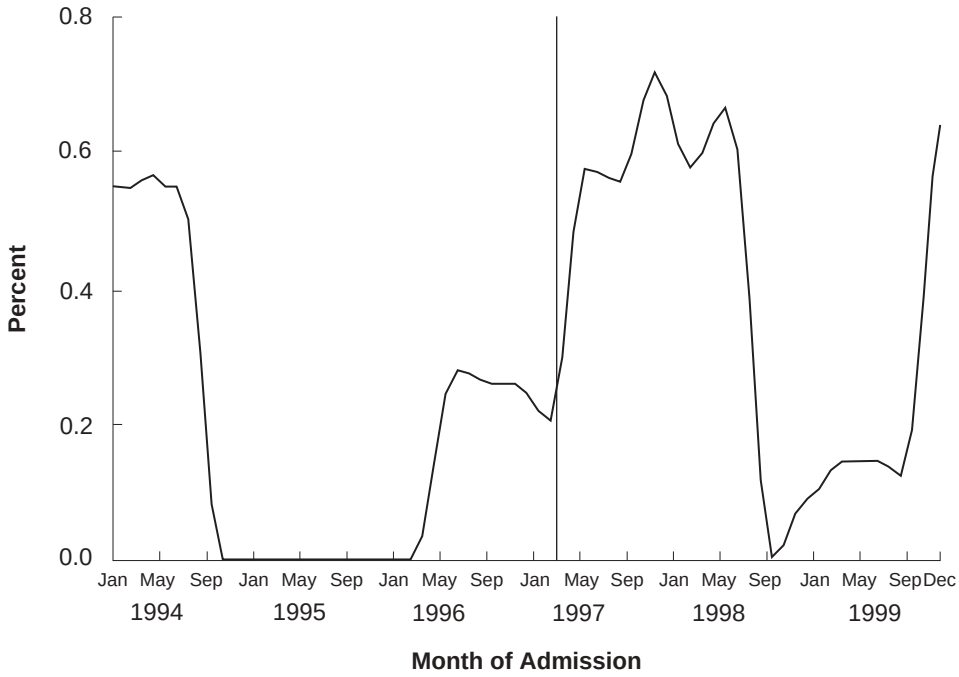


Exhibit 6

Percentage With Self-Reported Physical Disabilities Among Family Household Heads Admitted to Public Shelters in Philadelphia, 1994–99



The other effects found to be significant were declining proportions of people reporting substance abuse problems and increasing proportions of admission with disabilities. Again, the 1-year lag for the substance-abuse effect suggests that this finding may be spurious, although it may also suggest that families with substance-abuse problems are less likely to report such problems or to seek shelter owing to a desire to avoid scrutiny from social service staff. The disability effect, being more proximal to implementation,

Exhibit 7

Standardized Coefficients for Various Factors Regressed on Monthly Admissions to Philadelphia Shelters, January 1994–December 1999

Covariate	Families	Single Women
TANF caseload	0.13	–0.16
Consumer Price Index—rent	0.14*	–0.02
Unemployment rate	0.30**	0.02
Post-Act 35	0.11	–0.17

TANF = Temporary Assistance for Needy Families.
Note: Models also included two autoregression terms.
*$P < .10$, **$P < .01$, statistical significance in time-series regression model.

Source: U.S. Department of Commerce, 2001. Rent of Primary Residence CPI Series CUURA102SEHA.

suggests that disabled families are less likely to be able to benefit from the general expansion of jobs in the area as well as employment and training programs following TANF implementation, although the low proportion of disabled people among homeless families should be noted.

The apparent independence of welfare reform and the number of families admitted into Philadelphia shelters is probably due to the unexpected rarity of sanctions. Several analysts of welfare reform anticipated an increase in homelessness as a result of the state's sanctions against those who fail to begin working after 2 years of receiving TANF. Pennsylvania issued very few of these sanctions, so no major disruptions in the provision of TANF benefits were evident. The lack of an indirect effect of TANF caseload reductions on the risk for shelter admissions suggests that much of the decline in TANF caseloads occurred without a corresponding increase in residential instability.

As the close correspondence of the superimposed curves in exhibit 1 suggests, much of the decline in TANF caseloads paralleled a decline in unemployment. Declining unemployment, rather than welfare reform, may have been the source of caseload declines, suggesting that caseload declines were not associated with an indirect increase in hardship among nonparticipating households. Indeed, the multivariate time-series analysis, which included variables for unemployment and the consumer price index for rent in Philadelphia, were found to be positively associated with family shelter admissions, whereas TANF caseloads had no independent effect.

Authors

Dennis P. Culhane is an associate professor of social welfare policy at the University of Pennsylvania. His primary areas of research are homelessness and the dynamics of housing distress. His recent work includes studies of the effect of homelessness on the use of publicly funded health and human services in New York City. He is currently leading an effort to integrate property, neighborhood, and human services data from Philadelphia into geographic information systems to support policy analysis and program planning and evaluation.

Stephen R. Poulin is a Ph.D. candidate at the Columbia University School of Social Work. His dissertation research is being conducted at the University of Pennsylvania Center for Mental Health Policy and Services Research. His current research interests include the use of homeless management information system data for strategic reports and the longitudinal study of homelessness.

Lorlene M. Hoyt is an assistant professor of technology and planning in the Department of Urban Studies and Planning at the Massachusetts Institute of Technology. She received her Ph.D. in city and regional planning from the University of Pennsylvania and has worked for the city of Philadelphia as a housing analyst and geographic information system manager. Her research focuses on housing and community development.

Stephen Metraux is an assistant professor at the University of the Sciences in Philadelphia. His research focuses on the intersection of housing, homelessness, mental illness, and related urban issues, and his recently completed dissertation examines various approaches to housing mentally ill homeless people.

Notes

1. Administrative data were received from Dennis Putze, director of the Division of Statistical Analysis of the Pennsylvania Department of Public Welfare.
2. This situation is expected to change because Congress has recently required that jurisdictions establish the capacity to create unduplicated counts of the utilization of homelessness residential programs.
3. The T4253H method for converting time-series data uses a compound smoothing process, in which each step of the smoothing process converts the data smoothed by the previous step. The process starts with a running median of 4, which is centered by a running median of 2. A running median means that the median is calculated for sequential sets of consecutive time periods; for example, a running median of 2 calculates the median value for time 1 and time 2, time 2 and time 3, time 3 and time 4, and so on. The T4253H process then resmoothes these values by applying a running median of 5, a running median of 3, and hanning (running weighted averages). Residuals are computed by subtracting the smoothed series from the original series. This process is repeated on the computed residuals. Finally, the smoothed residuals are computed by subtracting the smoothed values obtained the first time through the process (SPSS 10.1 Help Topics). See Vellman (1980) for the theory behind this process.
4. The X-11 method adjusts time-series data for recurring monthly, trading day, trend, cyclical, seasonal, and irregular variations to facilitate comparability across time periods. See Yaffee and McGee (2000) for more information on decomposition of time-series data, a more detailed overview of the X-11 procedure, and applying X-11 to time-series data using SAS statistical software.

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