Trajectories of Health and Behavioral Health Services Use among Community Corrections–Involved Rural Adults

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This article seeks to establish time-based trajectories of health and behavioral health services utilization for community corrections–involved (CCI) adults and to examine demographic and clinical correlates associated with these trajectories. To accomplish this aim, the authors applied a latent class growth analysis (LCGA) to services use data from a sample of rural CCI adults who reported their medical, mental health, and substance use treatment utilization behavior every 60 days for 1.5 years. LCGA established 1.5-year trajectories and demographic correlates of health services among rural CCI adults. For medical services, three classes emerged (stable–low users, 13%; stable–intermediate users, 40%; and stable–high users, 47%). For mental health and substance use services, three classes emerged (stable–low, 69% and 61%, respectively; low–baseline–increase, 10% and 12%, respectively; high–baseline decline, 21% and 28%, respectively). Employment, gender, medication usage, and depression severity predicted membership across all services. Results underscore the importance of social workers and other community services providers aligning health services access with the needs of the CCI population, and highlight CCI adults as being at risk of underservice in critical prevention and intervention domains.

KEY WORDS: *community corrections; growth modeling; health care; mental health services; rural social work*

As social workers and other helping professionals seek to promote access to health and mental health services, it is likely that an increase in service utilization will be observed (Baicker et al., 2013). Increases in utilization may be due to changes in health care organization, health policy, or financing, including changes in insurance coverage, expansion of low-cost services, and the emergence of a managed care environment (Boyle & Callahan, 1995). These increases in health and mental health services utilization may be caused by increased need for services or by changes in attitudes toward service use (Frank & McGuire, 1986; Mackenzie, Gekoski, & Knox, 2006). Yet few studies have examined health and mental health services utilization from a longitudinal perspective among community corrections–involved (CCI) adults.

For social work, clear challenges exist in enhancing access to needed services for CCI populations, particularly in rural settings. For example, access to many services may be reduced due to distance to service providers (Staton-Tindall, Duvall, Leukefeld, & Oser, 2007), lack of adequate transportation (Blazer,

Landerman, Fillenbaum, & Horner, 1995), and lack of preventive care and access to programs promoting early identification and referral to treatment (Ryan, Riley, Kang, & Starfield, 2001). In a first step to better inform the delivery of health and mental health services to rural CCI adults, this study examined profiles of service utilization over a 1.5-year period.

LITERATURE REVIEW

Health Needs of CCI Adults

Presently, 7 million individuals in the United States are under correctional supervision, with two-thirds on probation or parole (Glaze & Bonczar, 2007). These two-thirds of the correction system's supervised adults total 600,000 individuals per year who are returning to the community from incarcerated settings (Travis, 2005). With the historical shift in the U.S. corrections system toward rehabilitation and community reintegration (Cullen, Cullen, & Wozniak, 1988), as well as the increased interest in avoiding recidivism (Taxman, 1998), current research efforts strive to understand what happens to

formerly incarcerated adults as they transition into community settings. The provision of targeted, community services is the principal method through which individuals on probation or parole receive preventive or residual care and is a critical factor in their community reintegration. In principle, individuals navigating the transition from corrections to community may present significant needs for treatment services for health and behavioral health (mental health and substance use) problems (Travis & Waul, 2003).

Nationally, 16% of individuals managing HIV infections have moved through a correctional facility in the past year. Up to 43% managing hepatitis C infections have passed through a correctional facility in the past year, and 40% of the nation's population currently managing tuberculosis disease has as well (Hammett, Harmon, & Rhodes, 2002). Furthermore, individuals transitioning from corrections to community represent a disproportionately higher percentage of people with mental health problems (including schizophrenia, major depression, bipolar disorder, and posttraumatic stress disorder) than the general population (Hammett, Roberts, & Kennedy, 2001; Vaughn, DeLisi, Beaver, Perron, & Abdon, 2012). Although most individuals transitioning from corrections to community with mental illness do receive some form of treatment services for mental health, substance use, or both (Vaughn et al., 2012), few receive clinically meaningful services: Research has determined that average levels of service utilization for mental health treatment among individuals transitioning from corrections to community are approximately two to five hours of service per month (Lovell, Gagliardi, & Peterson, 2002). In addition, nearly half of all prisoners were actively engaged in substance abuse during the time they committed the offense that sent them to prison (Mumola, 1999). The failure to treat a chronic substance abuse problem is routinely cited as a factor preventing the successful transition from corrections to community (Sampson & Laub, 2003; Zamble & Quinsey, 2001).

Service Access for Rural Adults

Across all types of health services, particularly in rural settings, individuals face difficulty locating and receiving services in response to their health care needs (Kulkarni, Baldwin, Lightstone, Gelberg, & Diamant, 2010). A combination of demographic and community factors (including minority status,

poverty, low numbers of health services providers, and lack of outreach by community health programs) often limit access to health and mental health services (Dumont, Brockmann, Dickman, Alexander, & Rich, 2012; Owens, Rogers, & Whitesell, 2011). If unmet, these service needs can heighten individuals' risk for continued unemployment, substance use, criminal activity, and recidivism (Huebner & Cobina, 2007; Wilper, Woolhandler, & Boyd, 2009). Thus, understanding the factors related to increased health, mental health, and substance use service utilization can help social workers develop interventions to increase the likelihood of services being provided to rural CCI adults.

Developing Health and Behavioral Health Services Utilization Trajectories

As with health and mental health services research generally, available epidemiological research examining service use by CCI adults has been principally descriptive and cross-sectional in nature. Studies examining CCI adults and their use of available mental health services (Morrissey et al., 2006) as well as studies of female CCI adults have found that race and ethnicity, education, income, and insurance are correlated with mental health services utilization (Grella & Greenwell, 2007; Lee, Vlahov, & Freudenberg, 2006). However, among a sample of male prisoners reentering the community, age and ethnicity did not appear to influence utilization of health services over a one-year period (Leukefeld et al., 2006).

Regrettably, no longitudinal research of which we are aware has been conducted to examine the prevalence of medical, mental health, or substance use treatment services utilization among CCI adults. Thus, identifying trajectories of treatment utilization over time among CCI adults may be an important first step in the larger enterprise concerning whether health and behavioral health services are being provided at critical times, the extent to which these service needs are being met appropriately and effectively, and identifying specific subgroups who may be at greatest risk of having unmet treatment needs and for whom prevention and intervention efforts may offer the most benefit. These questions point to the importance of temporally sensitive research methods given that community-based services availability and adult treatment needs should not be presumed to be constant over time (Parthasarathy & Weisner, 2005). By applying appropriate analytical

methods to longitudinal data on service utilization, specific questions to enhance service access and effectiveness can be answered, including “What are the health and behavioral health utilization trajectory profiles of rural CCI?” and “What are the sociodemographic correlates of these trajectory profiles?”

Approaches to Estimating Service Utilization Trajectories

Person-centered methods of classifying treatment utilization trajectories have the ability to generate empirically derived respondent profiles based on treatment utilization history (Jung & Wickrama, 2008). In contrast, traditional approaches (known as growth models) assume that a singular trajectory can adequately model the experiences of an entire population. However, this claim has been contested in studies finding that there is substantial heterogeneity in trajectory-related outcomes within a population (Jackson, Sher, & Schulenberg, 2008).

Latent class growth analysis (LCGA) presents an approach to estimating distinct subgroups using longitudinal data (B. Muthén & Muthén, 2000). LCGA is described as a longitudinal method, with the goal of classifying individuals into distinct groups or categories based on response patterns over time. Through the use of LCGA, distinct patterns concerning treatment utilization can be established that are driven by empirical classification and may more accurately reflect the changing service use experiences of CCI adults.

METHOD

Participants

Data were gathered from 148 CCI adults currently or recently supervised by parole and probation officers in Lincoln County, Oregon, a rural coastal county. Parole and probation officers, who made 80% of the referrals for the study, provided directories of county-listed supervisees. The remaining 20% of study participants were recruited through cold calls to individuals whose arrests had been published in local newspapers. At the conclusion of the study, 92.7% (148 out of 158) of individuals enrolled in the study had complete data. Participants were selected from families with at least one parent involved with community corrections. Individuals previously convicted of violent crimes or suspected of predatory sexual behavior were excluded from study enrollment. Post-hoc analyses indicated that the study sample was comparable to the countywide

community corrections population on key demographic characteristics (that is, gender, race or ethnicity, and intensity of corrections involvement).

The current study was developed as part of a community intervention study testing the efficacy of a specific parent training intervention (based on the Parent Management Training–Oregon model) for CCI adults and their children. Participants were randomly assigned to one of two conditions: (1) community as usual (CAU), where individuals participated in programs mandated by the court and their parole officer; or (2) motivational parent management training (MPMT), where adults attended a 12-week group parenting program targeted at improving at-risk adults’ parenting, mental health, and substance use outcomes (Eddy & Poehlmann, 2010). This research was approved by the institutional review board at the Oregon Social Learning Center.

Data and Measures

Health and Behavioral Health Services Utilization.

Information on the frequency of medical health, mental health, and substance use treatment services utilization was gathered from CCI adults for eight waves, every 60 days, via brief telephone interviews beginning October 2005. Data collection spanned just less than 1.5 years. Health, mental health, and substance use treatment services included any care obtained by visiting a private, federal, county, state, community, tribal, or church-based health or mental health provider (Leukefeld et al., 2006). Because no participant identified using more than two services for any period, service use was collapsed to a dichotomous variable for each wave of data.

Correlates of Service Utilization. At baseline, participants reported their age, employment status, education, income, race or ethnicity, gender, and whether they had insurance. In addition, participants reported the number of medications used to control their medical illness; total scores on the Beck Depression Inventory (BDI) (Beck, Steer, & Garbin, 1988) for each individual were calculated. Also, a substance use risk index was calculated, which consisted of seven items including both self-report and interviewer observation (Lee, Bank, Cause, McBeath, & Newell, 2015). Each of the seven items was measured using a four-point scale ranging from 0 = no risk involved to 3 = extremely high level of risk involved (Cronbach’s $\alpha = .69$). Items included in the risk index were a measure of recent alcohol/drug use, with three questions associated

with alcohol risk and three questions associated with substance use.

Age and income responses were categorized to reflect an even distribution of the sample. Employment, education, race or ethnicity, and gender were recoded as binary variables indicating whether each respondent was employed or unemployed, had greater than a high school degree, was a person of color or non-Hispanic white person, or was male or female, respectively. Last, as a control, a binary variable was created to differentiate between participants who were randomly assigned to CAU or MPMT.

Analytic Approach

LCGA (B. Muthén & Muthén, 2000) was conducted to estimate medical, mental health, and substance use services utilization trajectories over time. LCGA is a longitudinal data analytic method that identifies distinct, latent subgroups of individuals based on changes in variables over time, in which variables may be categorical, continuous, or binary (Nagin & Odgers, 2010). In this study, subgroups were established examining the trajectories of service utilization. The software program Mplus 7.0 (L. K. Muthén & Muthén, 2015) was used for all LCGA analyses. Mplus uses maximum likelihood estimates and measures of model fit to establish the general shape of trajectories of service utilization over time and correlates of group membership probabilities. Consistent with previous methodology (B. Muthén & Muthén, 2000; Nagin & Odgers, 2010), a two-stage model (trajectory group identification and correlates of group membership) was used that (1) established the number of class trajectories, and (2) examined correlates of class trajectory membership.

The optimal number of latent growth classes was based on both conceptual considerations and several statistical fit indices, including the Akaike information criterion (AIC) (Akaike, 1974), Bayesian information criterion (BIC) (Schwarz, 1978), sample size-adjusted BIC (SSABIC) (Sclove, 1987), Lo-Mendell-Rubin likelihood ratio test (LMR-LRT) (Lo, Mendell, & Rubin, 2001), and an entropy measure (Ramaswamy, Desarbo, Reibstein, & Robinson, 1993). In addition, the optimal number of latent growth classes was established by an examination of the practical relevance of identified classes, including the similarity of classes and the number of cases within each class.

RESULTS
Sample Description

Among our sample, 72% reported they were currently on probation, 22% reported they were on parole, and 5% reported they were under some other form of court supervision. Furthermore, participants reported that they had been arrested, charged with a crime, and booked an average of 8.3 times. When asked to report their lifetime arrest history, 51% of the sample reported arrest for possession, dealing, or distribution of drugs; 40% reported arrest for probation or parole violations; 34% for simple assault and battery; 24% for driving under the influence; 21% for burglary or breaking and entering; and 52% for some other offense. Additional sample descriptive statistics are presented in Table 1. A majority of the sample (41%) was 25 to 34 years old, with 57% reporting they were employed at baseline. Approximately 21% reported they had educational experiences beyond high school or a GED, and most (64%) reported an annual household income of less than \$20,000. About 19% of the sample were classified as a racial or ethnic minority (not white), 51% were male, and 56% reported they had some form of insurance at baseline. Participants reported an average of 1.1 (*SD* = 1.72, range = 0–6) medications currently being used to control their medical illness, reported an average BDI score of 10.5 (*SD* = 8.82, range = 0–46) (high end of “normal” range), and a mean score of 1.04

Table 1: Baseline Sample Characteristics (N = 148)

Characteristic	%	<i>M</i>
MPMT intervention	53.3	
Age		
18 to 24	21.6	
25 to 34	41.0	
35 and over	37.4	
Employed	57.3	
High school education or above	20.7	
Income		
Less than \$9,999	34.7	
\$10,000 to \$19,999	29.3	
\$20,000 or more	36.0	
Racial or ethnic minority status	19.3	
Gender (male)	50.8	
Insured	56.3	
Number of medications		1.14
BDI total score		10.50
Substance use risk scale		1.04

Notes: MPMT = motivational parent management training; BDI = Beck Depression Inventory.

(SD = 0.52, range = 0–2.23) on the substance use risk index.

LCGAs

Results from LCGAs indicated that across all three types of service utilization (health, mental health, and substance use), a three-class solution showed the best model fit and most interpretable classes. These three-class solutions were identified by improvement in model fit from a two-class solution, a suitable entropy value, and a statistically significant value for the LMR–LRT. Across all types of service utilization, a four-class solution was determined less optimal than the three-class solution due to increased values for the AIC, BIC, and SSABIC, as well as a nonsignificant LMR–LRT. Finally, a three-class solution was preferred due to meaningfully high estimated posterior probabilities of class membership (Nagin & Tremblay, 2005).

Table 2 presents the estimated posterior probabilities of service utilization for each class over time. In addition, Table 2 includes the probability of group membership, which examines the relationship between each group’s estimated probability and the percentage of cases assigned to each group based on a maximum probability assignment rule (B. Muthén & Muthén, 2000; Nagin & Tremblay, 2005).

Medical Services Utilization. As shown in Figure 1, intercepts and slopes were used to label growth classes. The three identified classes were as follows:

- 1. The stable-low (13%) class showed an estimated probability close to zero across the 1.5-year study period, suggesting this group represents a collection of nonmedical service users.

- 2. The stable-intermediate (40%) class had estimated probabilities between 0.34 to 0.44 for the 1.5-year period. This class represents a collection of episodic users, who appear to have had a stable, albeit low probability of medical services utilization over time.
- 3. The stable-high (47%) class had estimated probabilities of medical services utilization between 0.92 and 0.76. This group may represent a class of chronic service users, who, potentially, due to serious medical problems, maintained a very high probability of medical services utilization over time.

Mental Health Services Utilization. Figure 2 depicts the three growth classes associated with mental health services utilization:

- 1. Stable-low (69%), which represented the largest class of individuals. This class had estimated probabilities at or near zero for the duration of the 1.5-year period of data collection, suggesting the representation of a nonuser group of participants with this class.
- 2. Low-baseline-increase (10%), which showed an initial low probability of mental health services utilization. However, by waves 7 and 8, the estimated probability of service use rose to 0.56 and 0.68, suggesting an increased probability of service use over time.
- 3. High-baseline-decline (21%), which showed high estimated probabilities between waves 1 through 5 (0.84 to 0.59), with a decreased probability at waves 7 and 8 (0.43 and 0.36),

Table 2: Average Posterior Probabilities of Three Class Solutions for Medical, Mental Health, and Substance Use over Time										
Growth Trajectory Class	T1	T2	T3	T4	T5	T6	T7	T8	%	Probability of Group Membership
Medical care										
Stable low	0.06	0.07	0.07	0.07	0.08	0.08	0.09	0.09	46.6	0.81
Stable intermediate	0.34	0.36	0.37	0.38	0.40	0.41	0.42	0.44	40.3	0.78
Stable high	0.92	0.91	0.89	0.87	0.85	0.82	0.79	0.76	13.1	0.84
Mental health care										
Stable low	0.07	0.05	0.03	0.02	0.01	0.01	0.01	0.01	68.6	0.95
Low-baseline-increase	0.05	0.08	0.13	0.20	0.30	0.43	0.56	0.68	9.9	0.83
High-baseline-decline	0.84	0.79	0.74	0.67	0.59	0.51	0.43	0.36	21.3	0.92
Substance use care										
Stable low	0.19	0.13	0.09	0.06	0.04	0.03	0.02	0.01	60.5	0.92
Low-baseline-increase	0.19	0.27	0.37	0.48	0.59	0.70	0.79	0.85	11.8	0.86
High-baseline-decline	0.93	0.89	0.83	0.73	0.61	0.47	0.33	0.22	27.7	0.86

Notes: In column headings, T = time. % = percentage of sample assigned to each group based on maximum posterior probability rule.

Figure 1: Medical Services Utilization Class Trajectory Profiles

Figure 2: Mental Health Services Utilization Class Trajectory Profiles

suggesting a sustained high level of utilization, followed by a decline following the one-year mark of the 1.5-year data collection period.

Substance Use Services Utilization. As shown in Figure 3, a similar pattern of growth classes emerged for substance use services utilization. The three iden-

tified classes pertaining to substance use services utilization were as follows:

1. Stable-low (61%), which represented the largest class of individuals, with estimated probabilities at or near zero.
2. Low-baseline-increase (12%), which showed an initial low probability of substance use services

Figure 3: Substance Use Services Utilization Class Trajectory Profiles

utilization. However, by wave 5 the estimated probability of service use rose to between 0.59 and continued to rise to 0.85 at wave 8, suggesting a sustained increased probability of service use past the one-year point of the 1.5-year data collection period.

3. High-baseline-decline (28%), which showed high estimated probabilities up through wave 5 (0.93 to 0.61), with a diminished probability beginning at wave 6 (0.47) and continuing through wave 8 (0.22), suggesting an initial high level of utilization, followed by a reduced probability of service use after the one-year mark.

Correlates of Class Membership

To examine whether any individual-level factors were associated with growth class membership, mean estimation of the sociodemographic characteristics was examined, followed by chi-square analyses to assess whether significant differences emerged among growth classes. Table 3 presents estimated means of the growth classes. When examining correlates of medical services utilization class membership, chi-square analyses showed that members of the stable-low class (67%) were more likely to be employed than were members of the stable-high class (31%) [$\chi^2(3, N = 148) = 7.45, p < .01$]. Members of the stable-low class were more likely to be male (69%) than were members of the stable-high class (15%) and members

of the stable-intermediate class (41%), with members of the stable-intermediate class also more likely to be male than were members of the stable-high class [$\chi^2(3, N = 148) = 23.15, p < .01$]. Members of the stable-low class reported fewer medications currently being used to control their medical illness ($M = 0.45$) compared with members of the stable-high class ($M = 1.97$) [$\chi^2(3, N = 148) = 6.26, p < .01$]. Finally, individuals in the stable-high class ($M = 7.08$) reported lower BDI scores than did individuals in the stable-low class ($M = 17.68$) [$\chi^2(3, N = 148) = 7.34, p < .01$]. MPMT intervention status, age, education, income, racial minority status, insurance status, and substance use risk index at baseline were not significant correlates of medical services utilization growth class membership.

When examining the correlates of mental health services utilization, members of the stable-low class (68%) were more likely to be employed than were members of the high-baseline-decline (32%) [$\chi^2(3, N = 148) = 10.13, p < .01$]. Furthermore, members of the stable-low class were more likely to be male than were members of the high-baseline-decline class (21%) [$\chi^2(3, N = 148) = 10.43, p < .01$]. MPMT intervention status, age, education, income, racial or ethnic minority status, insurance status, number of medications used, BDI score, and substance use risk index at baseline were not significant correlates of mental health services utilization growth class membership.

Table 3: Mean Estimates Associated with Class Membership												
Medical Care				Mental Health Care				Substance Use Care				
Variable	Stable-Low (%)	Stable-Intermediate (%)	Stable-High (%)	χ^2	Stable-Low (%)	Low-Baseline-Increase (%)	High-Baseline-Dcline (%)	χ^2	Stable-Low (%)	Low-Baseline-Increase (%)	High-Baseline-Dcline (%)	χ^2
MPMT intervention	55	53	50	0.1	49	58	66	1.78	54	43	57	0.45
Age												
18 to 24	14	24	23	0.81	18	25	23	0.39	15	34	24	3.46
25 to 34	43	33	35	0.46	43	17	31	5.24	41	32	33	1.02
35 and over	35	35	36	0.01	33	51	36	1.56	36	31	36	0.1
Employed	67 ^a	54	31 ^a	7.45**	68 ^a	34	32 ^a	10.13**	68 ^a	36 ^{ab}	41 ^b	12.16**
High school education or above	16	23	31	1.34	16	14	39	4.38	24	12	18	1.76
Income												
Less than \$9,999	29	37	44	1.15	30	38	46	1.83	25	39 ^a	53 ^a	7.33*
\$10,000 to \$19,999	29	31	28	0.06	29	28	33	0.17	31	34	26	0.176
\$20,000 or more	42	32	28	1.06	41	34	19	3.86	44	26 ^a	21 ^a	6.78**
Racial or ethnic minority status	82	81	74	0.05	81	76	79	0.21	74	90	89	5.43
Gender (male)	69 ^a	41 ^a	15 ^a	23.15**	62 ^a	31	21 ^a	10.43**	56	37	44	3.24
Insured at wave 1	45	68	74	2.23	54	82	61	2.79	63	65	44	1.05
Number of medications	0.45 ^a	0.98	1.97 ^a	6.26**	0.72	0.52	1.51	4.22	0.85	1.13	0.76	0.32
BDI total score	17.68	12.05 ^a	7.80 ^a	7.34**	11.60	8.50	8.06	4.16	10.47 ^a	12.93 ^a	10.14	6.61**
Substance use risk scale	0.65	0.65	0.63	0.05	0.63	0.68	0.67	0.05	0.54	0.93	0.73	2.78

Notes: MPMT = motivational parent management treatment; BDI = Beck Depression Inventory. All percentages that share the a, b, or a,b superscript within a row and trajectory class are significantly different from each other at $p < .05$. * $p < .05$. ** $p < .01$.

When examining correlates of substance use services utilization, both members of the stable-low class (68%) and the high-baseline decline class (41%) were more likely to be employed than were members of the low-baseline-increase class (36%) [$\chi^2(3, N = 148) = 12.16, p < .01$]. In addition, members of the low-baseline-increase class (39%) were less likely to report income less than \$9,999 than were members of the high-baseline-increase class (53%) [$\chi^2(3, N = 148) = 7.33, p < .05$]. Similarly, members of the low-baseline-increase class (44%) were more likely to report income over \$20,000 than were members of the high-baseline-increase class (21%) [$\chi^2(3, N = 148) = 6.78, p < .01$]. Finally, members of the low-baseline-increase class reported higher BDI scores ($M = 12.93$) compared with members of the stable-low class ($M = 10.47$) [$\chi^2(3, N = 148) = 6.61, p < .01$]. MPMT intervention status, age, education, racial or ethnic minority status, gender, insurance status, number of medications used, and substance use risk index at baseline were not significant correlates of substance use services utilization growth class membership.

DISCUSSION

Incarcerated men and women returning to community settings have significant health, mental health, and substance use treatment needs. For these individuals, community-based social workers can play an essential role in their reintegration, particularly if social workers' efforts are targeted at factors promoting employment, health, and independent living. Yet CCI adults often have difficulty accessing needed services, particularly in rural settings where catchment areas are large and preventive and health promotion programming may be underresourced. The current study provides the first longitudinal accounting of CCI adults' service utilization trajectories.

From a service utilization and evidence-based intervention development perspective, the existence of these utilization trajectories highlights the importance of person-centered analyses allied with longitudinal data collection. Our observation of changing probabilities of mental health and substance use services utilization over time suggests three important considerations for future research and practice. First, because behavioral health services utilization may vary by person and time, understandings of service utilization developed from cross-sectional data may be quite different from those derived from longitudinal studies. This may be particularly evident when seeking to better understand the prevention and in-

tervention service needs and utilization histories of episodic and chronic users. For example, and as displayed in Table 2, the probabilities of service use for the low-baseline-decline class of users of mental health care grew from 5% to 68% over time; the corresponding probabilities for low-baseline-increase users of substance abuse treatment grew from 19% to 85%. Similarly, sweeping decreases in the probabilities of service utilization were registered for the high-baseline-decline class in these service domains. These growth classes comprised roughly a third of the full sample, implying that nonnegligible proportions of CCI adults may have behavioral health services utilization trajectories that either increase or decrease significantly over time.

However, concerning medical services utilization, the probabilities of service use over time were relatively stable. These findings may suggest that access to medical treatment services may be better in rural health care systems as compared with mental health and substance use treatment services, thus improving the delivery of medical care for individuals.

Second, temporal changes in the probabilities of health and behavioral health services utilization have clinical importance for the design and implementation of interventions to enhance access to needed community services for CCI populations. Specifically, social workers and other community service providers should ensure access to medical, mental health, and substance abuse treatment services consistently rather than only when formerly incarcerated individuals first reenter community settings. More generally, service providers should seek to align access to care with the needs of CCI adults. Because our study did not directly track changing levels of service use needs for study participants, it will be important for future studies to evaluate needs in relation to service receipt over time and examine whether clinically needed services are being provided. Decreasing the need-to-services gap is particularly important for formerly incarcerated individuals in the early period of their community reintegration experience, as many such adults have needs that go untreated or are exacerbated while they are imprisoned. This line of inquiry and intervention development highlights the role of social workers in promoting access to health and behavioral health care for this population.

Third, examining the demographic and clinical correlates associated with classes of service utiliza-

tion trajectories may help social work researchers and practitioners establish profiles of adults particularly at risk of underservice. In the current study, and consistent with previous research (Grella & Greenwell, 2007), we identified employment, gender, medical illness, and mental health–related differences in class trajectory membership. However, we did not find significant differences in class membership for other sociodemographic factors previously found or expected to covary with service receipt (including age, race and ethnicity, education, initial insurance status, and substance use risk). Although some of these nonsignificant findings may reflect the rural community context in which the study was located, additional research is needed to assess whether service use over time is associated more with individual characteristics or those pertaining to the broader community context in which individuals seek out services. It will be important for future research to develop demographic profiles of CCI adults who are at greatest risk of being underserved in relation to changing need levels.

Study findings and their implications for research and practice should be understood in relation to study limitations. The service utilization trajectories identified from this county- and state-based sample of rural adults should not be presumed to apply to all adults on parole or probation, or to all rural adults. Although the small sample size is a considerable threat to study generalizability, our identification of growth classes of adults with relatively consistent, increasing, and tapering probabilities of service use does comport with prior findings from other longitudinal studies concerning the substance use and mental health services trajectories among rural individuals (Curran, Ounpraseuth, Allee, Smail, & Booth, 2011). In addition, the study did not allow for examination of the causes of service utilization trajectories among the sample. Thus, the identified sociodemographic differences in service use growth classes should be understood as exploratory, which befits the state of the literature on the service needs of this population. Finally, detailed sociodemographic data were not available to permit more in-depth analysis of the individual-level factors associated with service utilization; this prevented the development of a refined predictive portrait of CCI adults' service utilization trajectories, including when participants' community supervision periods concluded. It is possible that a change in service utilization trajectories could coincide with leaving supervision.

CONCLUSION

Despite these limitations, the current effort provides the first longitudinal analysis of service use by CCI adults in the United States, and one of a few longitudinal studies of rural medical, mental health, and substance abuse treatment services use. Findings suggest that service use trajectories for men and women on parole or probation are nonmonolithic and can be organized coherently into distinct classes, some of which are nonmonotonic. These growth classes and their clinical significance and relevance for social work research and practice can be understood through examination of the changing probabilities of service use over time associated with growth class membership. In relation to these findings, additional research is warranted on the relationship between service need and utilization over time for CCI adults, and on the individual and community contextual predictors of service receipt. Such research may support the development of community programming enhancing access to needed medical and behavioral health care for formerly incarcerated adults and other at-risk populations. **SWR**

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