Cost Methodology

Introduction

The primary goal of the study was to comprehensively estimate the distribution of societal costs incurred by a population of adults with severe mental illnesses. Subjects for the research were identified from Social Security Supplemental Security Income (SSI) rolls and interviewed repeatedly over a 12-month period. In this data supplement, the methods used to collect and categorize the data are presented as well as the methods that were used to estimate the costs of the resources that were used. Resources from both formal and informal sources were included. Multiple existing data sources were employed to estimate costs. In this technical report, we detail the procedures that were used.

What Was the Structure of the Protocols Used to Obtain Service Use Data, and How Were These Data Recorded and Collected?

Interview Protocols

Three protocols were developed and administered to the study participants to obtain the service use information used in the cost analyses summarized in this article. The first protocol was a participant status protocol, which was organized into 10 broad areas that included 1) demographics, 2) quality of life, 3) clinical history, 4) functioning, 5) mental health symptoms, 6) alcohol and drug use, 7) perception, 8) empowerment, 9) satisfaction, and 10) service use. The participant status protocol involved participant self-reports and included a number of previously developed and psychometrically tested measures that had been shown to have high levels of reliability and validity and for which

normative data were available. Standardized measures included in the protocol were left intact and not modified. For the purposes of the societal cost study, only the detailed information regarding participants' current medication use contained within the clinical history section of this protocol was used.

The second was the family experiences protocol, which was administered to a family member or close friend of the study participant. This protocol paralleled the participant status protocol but also included a number of questions that assessed the respondent's relationship to and level of involvement with the participant, the types of assistance they provided to the primary study participant, and the amount of time they spent assisting the study participant. These data were used to help cost family and friends contributions to the support of the study participant.

All other service use data were obtained from a second self-report Service Utilization Survey (SUS) that was developed specifically for this study and designed to identify and document a comprehensive array of health-related (e.g., medical, mental health, substance use) and non-health-related (social, legal, basic needs) services that participants received during the study period. The full protocol is appended. The protocol was structured into five primary sections. The first section was designed to collect data on each inpatient and the residential service (e.g., detoxification, hospital stay, crisis stabilization units) a study participant received. The second section was designed to capture study participants' attendance at nonresidential day programs (e.g., day treatment, partial hospitalization) in which a variety of discrete services could be provided but that are reimbursed on a per diem basis.

Section three was intended to record any health or nonhealth service that the participants received on some "regularly scheduled basis" (e.g., dialysis, laboratory tests,

medication management visits). The fourth section was structured to capture any irregular health or nonhealth services (e.g., doctor's visit for the flu, visit to a food pantry, being arrested) that the participants received. The final section was designed to collect information on participants' housing, sources of income, and the health care plan in which they were enrolled.

In sections two through five, the respondent was asked a series of structured questions for each of the services that he/she received. First, they were asked to identify the reason that they received the service (e.g., medical, mental health, legal, etc., reasons). Multiple reasons could be identified. Second, they were asked to report the type of provider that they saw, including multiple providers as appropriate (e.g., medical doctor, nurse, social worker, etc.). Third, they were asked to characterize the kind of service that was delivered (e.g., physical examination, counseling session, laboratory work, etc.). The fourth question regarding the service involved the location where it was provided (hospital, clinic, own home, etc.). The fifth question involved the frequency with which the service is delivered, including the number of times it was received during the interval between interviews (last month for the initial interview) and the number of minutes per visit. The sixth question involved the mode of transportation that was used to travel to the service. Seventh, personal and family out-of-pocket expenses were recorded. Finally, the respondents were asked to identify the payer for the service.

Recoding and Data Collection

Before the collection of any data, all study procedures and protocols were reviewed and approved by the university's social/behavioral institutional review board. All study participants provided written informed consent before enrollment into the study and the collection of any data.

Owing to lagged enrollment into the study, participant status and service use data were collected between October 1997 and November 1999. The participant status protocol was administered at three points in time during the study: at intake into the study, approximately 6 months following intake, and at discharge from the study, approximately 12-months postintake. Participant status protocols were administered during face-to-face interviews that lasted, on average, approximately 1½ hours. Protocol questions were read aloud to study participants who used response cards specially prepared for this study to signify their answers. Trained interviewers recorded participant responses onto the protocol.

The family experiences protocol was administered at one point in time at the end of the study period. The questions were framed to capture the respondent's assistance to the study participant during the entire study period.

In terms of the service use protocol, attempts were made to conduct face-to-face interviews with each study participant on a bimonthly basis beginning 2 months after the initial participant status interview was completed. This timeframe was selected to maximize service use recall. In addition, protocols were administered with a calendar follow-back procedure to maximize recall of service use. Additionally, when field staff were interviewing study participants, they reminded them of the date when they were last interviewed to try and ensure that all services received since the previous interview were recorded.

Interviewers recorded each service a participant reported on a matrix recording form (see Service Utilization Survey as data supplement 2).

The 628 individuals included in this study averaged five service utilization interviews, and overall, a total of 3,102 interviews were completed. The average total

time on which service use data were collected spanned 450 days. Although attempts were made to complete these interviews on a bimonthly basis, the average elapsed time between interviews was 90 days. No significant differences were observed between financing conditions on the frequency of completed interviews.

Definitions and Cost Methodology

Societal costs for a study participant were measured as the sum of service use costs (physical health, mental health, substance abuse, and social), pharmacy costs, income, miscellaneous social services, adjusted housing subsidies, family/friend contributions, and legal system and transportation costs for a standardized time period. The general strategy for societal cost estimation was to calculate a product based on the use of the resources or participation in activities self-reported in the SUS and their respective unit cost estimates. The services/activities reported in the SUS were classified into one of the resource categories, which, in turn, were categorized into three groups based on payment sources: 1) plan cost, which included all services covered by the respondent's Medicaid plan; 2) other public cost, which include all services not covered by the respondent's Medicaid plan but paid by other government or nonprofit agencies; 3) private cost, which included any services provided by family members or friends or self-paid. Medicaid plans covered primarily health, mental health, and transportation services. All social services were considered to be other public cost. To determine the appropriate cost sector for health services, Medicaid health plan contracts for managed care organizations and Medicaid provider handbooks were used to identify plan-covered services. Additionally, self-report information about where and who provided the services was also used to determine cost sectors:

A. Plan cost: any health service listed in the Medicaid contract and provided by eligible health professionals in any health professional setting, such as a physician's office, clinic, hospital, community health or mental health center, or assisted living facility

B. Other public cost:

a. Any non-Medicaid health service or other public service provided by a government or nonprofit agency, such as jail, prison, or county indigent clinic

b. Any service provided by a health professional in a non-health-care setting, such as at a health fair or house of worship

C. Private cost:

a. Any assistance provided by family or friends in meeting the respondent's needs

b. Any out-of-pocket payment, including copayment for services

Below is a summary of our cost methodology.

Table 1. Cost Methodology

Resource Category	Estimation Process and Notes	
	Services Use Category	Unit Cost and Cost Estimate
Physical health services	Reported physical health services were sorted into the following categories: Inpatient services: Inpatient hospital stay, nursing/medical rehabilitation stays, hospice and hospital day surgery Emergency services: hospital medical emergency room visit Outpatient services: 1) medical/surgical care: hospital outpatient visit, day surgery/ambulatory surgery center, dialysis, community-based outpatient services, physician nonsurgical office visit, physician surgical office visit, physician home visit, podiatrist nonsurgical office visit, podiatrist surgical office visit, dental care, hearing care by audiologist, and vision services by optometrist Note: In some cases, services were further delineated by provider credentials and whether offered in an individual or group setting. The reported service use was sorted based on by whom and where a service was provided: *On plan*: any physical health service provided by eligible health professional in professional setting *Other public*: any physical health services provided in other state/local government settings or in nonhealth setting by a health professional *Private*: any service or cash expenditures provided by family member/friends or self-paid	*On plan* and o*ther public*: The cost of a subject's reported physical health service use was evaluated at the estimated average amounts paid for such services by Medicaid using the following unit cost methodology for each of the identified services: With the 1997 Medicaid claims data for study subjects, a list of Medicaid physical health category codes reported on at least one study subject was identified. These claims were matched with the physical health services reported in the SUS to obtain the number of SUS events reported in the Medicaid claims file. Residual ancillary claims, radiology/laboratory work claims and other professional consultations were bundled with the claims from B based on the date of the ancillary service. Finally, *unit cost per physical health service category* was calculated as the average of Medicaid payments for all claims bundled into the service category (i.e., the sum of Medicaid payments divided by the number of Medicaid reported claims assigned to that service category). *Private*: Any out-of-pocket payment including self-pay and copayment for services. If time was provided by family/friend, service was evaluated at the hourly minimum wage based on self-report of frequency and duration. *Cost estimation:* The product of the count of reported use and its corresponding unit cost estimate.
Mental health/substance abuse services	A list of mental health services reported by at least one subject in the SUS were sorted into the following categories: Inpatient general hospital stays, inpatient state hospital stays, psychiatric emergency room, crisis stabilization stays and services, rehabilitation day treatment, day program,	Costs for each subject's reported mental health service use was estimated as the average amount paid for such services by Medicaid or by a standard reimbursement rate established by the Florida Medicaid Authority (AHCA) using the

	therapy, medication management, case management, evaluation, assessments, and attendance at AA/NA meetings for substance abuse treatment. Note, in some cases, services were further delineated by provider credentials and whether offered in an individual or group setting. The reported use was sorted into categories based on by whom and where a service was provided: *On plan*: mental health service provided by eligible mental health professional in professional setting. *Other public*: Mental health services provided in other state/local government settings or in nonmental health setting by a mental health professional. *Private*: Service or cash expenditures provided by family member/friends or reported as self-payment.	following methodology: Each service category was determined to be Medicaid reimbursable or financed by AHCA. With the exception of state hospital stays, a published (Medicaid) rate was used for the Florida AHCA services. An average cost for state hospital stays was calculated from operating costs reported by the state hospitals used by study participants. *On plan*: see unit cost methodology for physical health category *Other public*: with the exception of state hospitals, same procedures used as in physical health summarized earlier *Private*: if time was provided by family/friend, costs were estimated using the hourly minimum wage Costs for AA/NA participation not in a formal treatment setting was estimated with a reported average cost per session found in the literature (2). AA/NA meetings were considered *on plan* if held in a facility that received Medicaid payments and *other public* in any other setting. *Cost estimation:* The product of the count of reported use and its corresponding unit cost estimate.
Pharmacy	Pharmacy use includes both prescription medicine and over-the-counter medicines as reported as being used by the participants. *On plan*: any reported prescription medication found in Medicaid pharmacy data *Other public*: self-reported prescription medication not found in Medicaid pharmacy data *Private*: all reported over-the-counter medication use, self, family, or friend pay for any medication	Prescription medication could be paid by Medicaid (on-plan cost) or obtained through other public agencies such as in jail or prison or charity program (other public cost) or self-paid (private cost). To determinate cost, all reported prescription medication was first matched with Medicaid pharmacy claim files. Other reported medication use for which no Medicaid claim was recorded was categorized as other public or private depending upon reported payer source. *On plan*: used the amounts paid and reported in the automated prescription data systems for medication found in Medicaid pharmacy *Other public*: used the corresponding average amount paid for a prescription found in the

		Medicaid file for each medication *Private*: used the reported over-the-counter medication paid out-of-pocket and reported copayments. *Cost estimation:* Average cost per prescription as reported in the Medicaid pharmacy data file or self-reported amount.
Miscellaneous resource categories: other (volunteer)	Respondent self-classified miscellaneous services included the following categories: daily living services, basic needs (food, meals, clothing), educational/vocational services, and social services. Each of these categories was further classified by where and who provided the resource/service. Many were eliminated because their costs were included in the costs associated with a particular location or program (e.g., jails, prisons, supportive housing programs, day programs, ALFs, etc.), or they were moved to another category (e.g., daily living services moved to care provided by friends or family). The remaining observations were sorted by provider category (clergy, volunteer, pharmacist, attorney, teacher, store clerks, others). Because so few of the remaining miscellaneous services were provided by pharmacists, attorneys, teachers, or store clerks, observations involving these provider types were dropped.	On plan: n/a Other public: miscellaneous services provided by clergy were evaluated at the minimum wage, and miscellaneous services provided by volunteers were evaluated as the product of the amount of time reported by the respondent and the minimum wage. Private: family/friends time contributions were valued at the minimum wage.
Income	Included to capture expenditures made by subjects for other goods and services, including housing. Amount depends on self-report in the SUS.	Estimated for a subject by summing the amounts of income (wages, SSI/SSDI, VA benefits, unemployment, food stamps, other pensions, alimony, private transfers, illegal gains) less copayments, as reported in respondent interviews. Income was sorted into four categories: earned in current period, earned in past period, public transfer, private transfer. The analyses assumed the subject did not save. *On plan*: n/a *Other public*: sum of reported SSI and food stamps *Private*: sum of reported wage earnings, VA benefits, SSDI, unemployment, other pensions, alimony, private transfers and illegal gains.
Housing subsidies	The subsidy represents additional money expended for housing on behalf of the respondent. The amount depends on housing type. Respondents reported the number of nights they stayed in HUD section 8 housing and adult homes.	For HUD section 8 housing, the per diem subsidy equaled two-thirds of the fair daily market rental rate (3). Further adjustments were made when living with family/friends. For respondents living in adult

		homes, the per diem subsidy equaled the optional state supplement for SSI recipients who reside in adult homes. For nights spent in nursing homes, state hospital, jails or prison, no housing subsidy was added since such housing costs were already accounted for in plan or other public costs. Boarding house nights were not associated with any additional costs. *Cost estimation:* *On plan*: n/a *Other public*: product of nights in HUD section 8 housing and HUD section 8 per diem, plus the product of nights in adult homes and the OSS per diem. *Private*: n/a, embedded in residual income amount.
Legal system	Respondent self-reported events involving the legal system were categorized as jail time, prison time, probation, court-mandated community service, police call, attorney meeting (private and with a court-appointed attorney), and court appearance for which unit cost information was available.	Cost estimation for each reported event used the following methodology: A unit cost, with varied documents, was assigned to each category of legal system involvement. A cost was assigned to each event by summing the cost of each discrete encounter included in the event. Because of the lack of financial information, we were unable to include the costs associated with court-mandated community services or to distinguish between types of police calls or of attorney contact. *Cost estimation*: *On plan*: n/a *Other public*: sum of products of reported events and their respective unit costs *Private*: self-reported expenditures
Family/friends support	Included to account for time spent by family and friends providing subject with assistance for personal hygiene, medication monitoring, housework, shopping, preparing meals, transporting, and money/time management. Use: event and time information reported in SUS with supplementary data gleaned from the 6-month Family Experiences Interview Schedule	Private cost estimation: family/friend support costs estimated as the sum total of all reported time (in hours) multiplied by the minimum wage rate (4). Comments: Omitted support time rendered by subject to family/friends. Other categories of family/friends resources (e.g., money transfers, housing) were captured elsewhere.
Transportation	Included to capture transportation costs not paid directly by the subject during an	The product of the count of reported use and its corresponding

	interview period. These costs include self-report of ambulance, Medicaid-reimbursed taxi ride, special community van or friend/relative car rides to services and activities. *On plan*: self-report of ambulance, Medicaid-reimbursed taxi rides to and from Medicaid-covered services *Other public*: self-report of ambulance and taxi rides to and from other public services *Private*: reports of car rides supplied by family or friends	unit cost estimate. *On plan*: for ambulance rides, unit cost is the amount paid by Medicaid for transportation divided by number of reported trips found in Medicaid claims file. *Other public*: Medicaid rate for transporting in a van/car *Private*: if time was provided by family/friend for transportation to services, the cost was determined by multiplying the hourly minimum wage by the amount of time volunteered by the friend or family member. Mileage costs were not estimated.

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