Expenditures for Treating Schizophrenia: A Population-Based Study of Georgia Medicaid Recipients

by Bradley C. Martin and L. Stephen Miller

Abstract

The study analyzed all claims data for reimbursable medical services and drugs rendered to 18- to 50-year-old Medicaid recipients in the State of Georgia over a 3-year period. A cohort of 6,443 schizophrenia patients were identified by inspecting the medical history data for claims indicative of schizophrenia (ICD-9-CM 295.xx). A crude prevalence of 6.02 percent was identified. Use patterns and charges associated with schizophrenia were stratified by major areas of service including ambulatory services, hospitalizations, and pharmacological treatment. The incidence of rehospitalization for chronic schizophrenia patients based on a 12-month hospitalization index format was also identified. Findings are discussed regarding using these data to focus strategies for assessing schizophrenia treatment outcome in relation to treatment cost.


Schizophrenia is a disabling condition that afflicts approximately 1 percent of U.S. residents 18 years of age and over (Keith et al. 1991; Regier et al. 1993). The life course of schizophrenia is such that persons in their thirties through their fifties, typically the most productive years in terms of current economic measures, show the highest prevalence. Additionally, estimates suggest that approximately 50 percent of persons diagnosed with schizophrenia eventually become significantly and permanently disabled (Rupp and Keith 1993). As our understanding of the etiology of schizophrenia has expanded in recent years, so have the design and implementation of a number of treatment strategies. The effectiveness of these multiple treatments has been hopeful, and real gains in treatment have been seen. However, treatment effectiveness remains an ongoing area for research, with few definitive answers to date regarding that effectiveness.

The economic burden of schizophrenia at the societal, community, and personal levels is staggering. This points to the need for not only researching effective treatment strategies but also assessing the relative cost versus benefit of those treatments. It is our position that before assessing these benefits, a clear understanding of direct economic burden must first be established.

Accurate information regarding the economic burden of schizophrenia is essential but has historically been difficult to acquire (Andreasen 1991). Research to date has focused on both global indices of direct costs as well as estimates of indirect costs (Hall et al. 1985; Andrews 1991; Davies and Drummond 1994; Evers and Ament 1995). The data generated have been invaluable and have indicated that schizophrenia exacts a significant economic burden and is by far the most costly mental illness (McGuire 1991). For example, while prevalence is at approximately 1 percent in the United States, annual health care expenditures are approximately 2.5 percent (Rupp and Keith 1993). Similar discrepancies in prevalence have been identified in other countries, including The Netherlands (Evers and Ament 1995) and the United Kingdom (Davies and Drummond 1994). Total economic costs (as of 1990) for U.S. health care expenditures have been estimated as high as $33 billion annually (Rice et al. 1991; Rice and Miller 1993, 1996). The incredible cost of schizophrenia has a tremendous effect on all levels of society, including employers, health care payers, Federal and State public budgets, individual patients, and the families of these afflicted individuals. Since patients who suffer from schizophrenia are in the peak productivity years of their lives, the disorder additionally bears enormous indirect costs to society, primarily reflected in the loss of future productivity, in addition to the expenditures for care of the individual.

Reprint requests should be sent to Dr. L.S. Miller, Dept. of Psychology, The University of Georgia, Athens, GA 30602-3013.
Given the enormous economic burden and multiple strategies currently available to treat the disorder, evaluating the effectiveness of different treatment strategies and comparing their costs becomes vital. To date, most of the data addressing this question have been collected in the form of aggregate summaries from various sources such as the National Institute of Mental Health (NIMH) Epidemiologic Catchment Area (ECA) studies (Manderscheid et al. 1993; Narrow et al. 1993; Regier et al. 1993) or the ECA studies in combination with other data sources such as the NIMH National Reporting System (Manderscheid et al. 1993). These data have been extremely useful in providing aggregate summaries and inferences based on correlations between the average use of resources and very broad outcomes for the average person with schizophrenia. Having these sources has allowed the additional indirect evaluation of many possible schizophrenia treatments as well as some inquiry into patient-level variables such as service use type, service provider type, or specific pharmacotherapy type. However, they are for the most part restricted to subsamples of service recipients. Additionally, these studies are less amenable to comparisons of costs among services at the patient level. Few studies have attempted comprehensive patient-level direct-cost estimates (Moscarelli et al. 1991).

As a first step in specifying some of these relationships, we present data describing a comprehensive cohort of patients diagnosed with schizophrenia taken from the entire population of Medicaid patients who made any type of Medicaid claim in the State of Georgia from 1991 through 1993. This cohort is described in terms of detailed and comprehensive information on the use of medical resources.

We studied the administrative data regarding provider and recipient claims or medical bills of recipients eligible for benefits in Georgia. These data were chosen because they allow a detailed description of ambulatory physician/clinic/psychologist, inpatient, and outpatient prescription use. The Georgia Medicaid administrative data have been used to describe the effect of other conditions (Martin et al. 1994) and of various policy initiatives (Kotzan et al. 1993; Martin and McMillan 1996). Additionally, administrative data of this type have been found to be valid for economic and epidemiologic investigations (Bright et al. 1989; Ray and Griffin 1989; Soumerai et al. 1991).

The purposes of this article are to (1) describe crude prevalence of the disorder in a large comprehensive population of people who use medical resources; (2) report specific use patterns and charges associated with schizophrenia; (3) stratify those use patterns and charges by major areas of service; (4) explore the incidence of rehospitalization for chronic schizophrenia patients; and (5) describe pharmacotherapy use over the 3-year study period. Our premise is that this information as well as this general methodology can be used as a springboard to develop strategies for assessing schizophrenia treatment outcome in relation to treatment cost.

Methods

Data Source. Medicaid data were obtained from the Georgia Department of Medical Assistance (GDMA; 1992) from January 1, 1988, to December 31, 1993. When output in character and numeric format, the data were found to be consistent with supplied documentation. The data were housed at the University of Georgia and had been converted to statistical analysis system (SAS) data sets stored on 3490E cartridges. The data consisted of three files: the recipient file contained the demographic profile and eligibility history for each Medicaid enrollee; the prescription file supplied all prescription transactions reimbursed by the GDMA drug program; and the medical history file contained information for all reimbursed non-drug medical claims for the study period.

Medicaid Cohort. Patients were included in the Medicaid cohort if they were between 18 and 50 years of age as of January 1, 1991, and were continuously eligible for Medicaid benefits during the period January 1, 1991, to December 31, 1993. The continuously eligible Medicaid cohort numbered 107,111, compared with the total Medicaid-eligible population for Georgia in 1992 of 848,029 (Georgia Department of Medical Assistance 1992). The Medicaid cohort was extracted from the recipient file of all Medicaid patients.

Schizophrenia Cohort. Patients were initially identified from the medical history file of all Medicaid patients based on medical claims that included the principal or secondary International Classification of Diseases—9th revision–Clinical Modification (ICD—9–CM) 295 series designation (U.S. Department of Health and Human Services 1989). Patients were included in the schizophrenia cohort if they met the Medicaid cohort criteria and additionally had at least one medical claim for schizophrenia during 1991–92 with a principal or secondary ICD—9–CM designation in the 295 series. (All outpatient and inpatient claims were considered as possible markers indicative of schizophrenia.) Persons newly diagnosed with schizophrenia in 1993 were not included in the cohort; however, costs are described for 1993 for those diagnosed in 1991 and 1992. The inclusion criteria were restricted to schizophrenia diagnoses for the first 2 years of the study to ascertain the cost of care for those persons.
with schizophrenia for at least 1 year following an initial diagnosis.

More than 9.7 and 11.7 million medical history claims for 1991 and 1992, respectively, were searched for ICD-9-CM fields with the leading three-digit designation 295. The search found 126,520 schizophrenia-positive ICD-9-CM claims for 1991 and 137,867 for 1992. The trailing two-digit ICD-9-CM designations were ignored. Additionally, both primary and secondary diagnosis fields were searched for schizophrenia-positive ICD-9-CM designations. The data indicated that nearly 100 percent of the schizophrenia-positive claims were identified via the primary diagnosis field. Over the 2-year period, 12,873 recipients had at least one claim with a primary or secondary diagnosis of schizophrenia.

The data base of the 107,111 continuously eligible recipients ages 18–50 (the Medicaid cohort) was match merged with the medical history file's 12,873 schizophrenia recipients using a unique recipient ID code common to both files. This step was executed to exclude those recipients younger than 18 or older than 50 years of age and those recipients not continuously eligible for Medicaid benefits from January 1991 through 1993. The match merge found 6,443 Medicaid recipient IDs for patients with at least one medical history claim for a schizophrenia-related episode who were continuously eligible for the 3-year study period and were between the ages of 18 and 50. Since the restrictions of age and continuous eligibility were applied simultaneously by the match-merge procedure, it is impossible to determine if persons were excluded due to age or discontinuous eligibility, although it is suspected that most of the 6,430 excluded recipients had discontinuous eligibility.

The 6,443 recipient IDs were then match-merged with the 1991, 1992, and 1993 medical history and prescription claims data, creating a complete data set containing all medical and outpatient drug-related records for the cohort.

Hospital Episodes. All hospitalizations except those stays at long-term mental health inpatient facilities operated by the State were analyzed for the incidence of hospitalization and rehospitalization. The 10 State-operated facilities do not bill Medicaid for services rendered due to Georgia State billing practices. This policy precluded such services rendered to Medicaid recipients from appearing on the GDMA medical history administrative files.

Hospitalizations were identified by searching the medical history files for claims with an ICD-9-CM designation in the 295 series and a category of service (COS) designation of 01 (inpatient hospital). To be certain this algorithm detected all inpatient hospitalizations, the medical history file was initially searched for COS = 01 and these records were cross-tabulated with two other variables: primary revenue code and claim type. The most common revenue codes and claim type designations were retained. In another iteration, two separate data steps searched the entire medical history file for revenue codes and claim types associated with hospitalizations identified in the previous step. The records identified with the inpatient revenue codes and claim type variables were then cross-tabulated by COS. All inpatient records identified with the revenue code and claim type variables had a COS designation of 01. This backward-checking procedure validated the algorithm for identifying inpatient hospitalizations with the COS variable, ensuring that all inpatient records reimbursed by GDMA had a COS designation of 01.

Length of stay was established by the following algorithm: [(to date of service) – (from date of service)] greater than zero, and at least 1 day separating the discharge date from a prospective admission date. Hospitalizations were tallied to determine the hospitalization rates of all persons with schizophrenia. Persons with a hospitalization in 1991 were tracked for 365 days starting from their most recent hospitalization to determine the 1-year rehospitalization rate of persons with schizophrenia. The rehospitalization rate was used to determine the rate of hospitalizations for persons who already have used a source of care, in contrast to the hospitalization rate for all eligible persons with schizophrenia.

Results

Epidemiology of Schizophrenia. The crude 2-year prevalence rates stratified by demographic variables are presented in table 1. The crude prevalence rate for schizophrenia was 6.02 percent. Crude prevalence stratified by race (specifically white vs. black) and residence was similar to the overall crude rate. Crude prevalence was greater for males, persons over 30, and Medicare recipients than for their respective comparison groups. The higher prevalence for Medicare recipients was not unexpected as schizophrenia is a condition that qualifies a person for supplemental security and disability income (SSDI) payments.

General Medical Use. A total of 795,597 (249,668 in 1991; 274,539 in 1992; 271,390 in 1993) nonprescription medical claims were identified in the Georgia Medicaid claims history for the schizophrenia cohort. These claims describe the total GDMA reimbursable medical use for persons with schizophrenia, both nonschizophrenia and schizophrenia-related claims, and averaged 3.4 medical claims [798,286/(6443*36)] at an average cost of just over $425 per recipient per month. Only 215,118 (27.1%) of those medical claims were schizophrenia related from
Table 1. Crude prevalence of schizophrenia in Georgia Medicaid recipients (1991–93) stratified by race, residence, age, gender, and Medicare eligibility

<table>
<thead>
<tr>
<th>Variable</th>
<th>Medicaid recipients(^1) ((n = 107,111))</th>
<th>Persons with schizophrenia ((n = 6,443))</th>
<th>Crude rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>31,029</td>
<td>1,827</td>
<td>5.89</td>
</tr>
<tr>
<td>Black</td>
<td>70,117</td>
<td>3,872</td>
<td>5.52</td>
</tr>
<tr>
<td>Other</td>
<td>356</td>
<td>1</td>
<td>0.28</td>
</tr>
<tr>
<td>Unknown</td>
<td>5,609</td>
<td>743</td>
<td>13.25</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>93,565</td>
<td>5,588</td>
<td>5.97</td>
</tr>
<tr>
<td>Urban</td>
<td>13,546</td>
<td>855</td>
<td>6.31</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–29</td>
<td>52,581</td>
<td>1,722</td>
<td>3.27</td>
</tr>
<tr>
<td>30–39</td>
<td>34,506</td>
<td>2,771</td>
<td>8.03</td>
</tr>
<tr>
<td>40–50</td>
<td>20,024</td>
<td>1,950</td>
<td>9.74</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>22,412</td>
<td>2,836</td>
<td>12.65</td>
</tr>
<tr>
<td>Female</td>
<td>84,699</td>
<td>3,607</td>
<td>4.26</td>
</tr>
<tr>
<td>Medicare eligible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>34,577</td>
<td>4,487</td>
<td>12.98</td>
</tr>
<tr>
<td>No</td>
<td>72,534</td>
<td>1,956</td>
<td>2.70</td>
</tr>
<tr>
<td>Total and %</td>
<td>107,111</td>
<td>6,443</td>
<td>6.02</td>
</tr>
</tbody>
</table>

\(^1\)Medicaid recipients who were continuously eligible in 1991, 1992, and 1993 and were between 18 and 50 years of age.

1991 to 1993 as identified by a primary diagnosis field with an ICD-9-CM designation in the 295 series.

Table 2 shows the total reimbursement by Medicare and Medicaid over the cohort for each study year as well as the Medicaid expenditures specific to schizophrenia-related care. The mean expenditures reported in the tables reflect the average price paid for each claim or the average price per unit of service delivered. Within this cohort, approximately $12.8 million of the annual Medicaid budget goes to schizophrenia-related care for an average of $166 per recipient per month (tables 1 and 2; 41.3% of expenditures). Inspecting the claims distributions across the 3 years showed that, schizophrenia-related care in 1991 accounted for 39 percent of all claims, in 1992 for 29 percent of all claims, and in 1993 for 24 percent of all claims.

Table 3 shows the number of claims and expenditures by category of service specific to schizophrenia-related care. In excess of $38 million was spent for 215,118 nonprescription schizophrenia-related medical claims from 1991 to 1993, an average of $165.86 (\$38,472,146/\(6443*12*3\)) per recipient per month over the 3 years. The majority of claims and expenditures went to community mental health centers, 78 percent of all claims and 69 percent of all expenditures. Inpatient episodes accounted for a relatively small number of claims (approximately 1%) but consumed nearly 18 percent of all expenditures in this area. More than 97 percent of all schizophrenia-related spending went to, in descending order, mental health centers, inpatient care, nursing facilities, and physicians. Of these four categories, mental health centers and inpatient care are clearly the two cost drivers, accounting for more than 86 percent of all nonprescription schizophrenia-related spending.

Mental Health Center Use. Since mental health centers and inpatient care areas accounted for a majority of the schizophrenia-related medical spending, these categories were more closely examined. Table 4 shows the most common procedure (Current Procedural Terminology, Revision 4) codes (American Medical Association 1992) billed by the mental health category of service, and the spending associated with the claims. The majority of services reimbursed by Medicaid involved some form of “day treatment” or counseling. However, more than 62 percent ($66.08/recipient/month) of the dollars reimbursed by Medicaid included some form of “day treatment.” Day treatments are blocks of hours (approximately...
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Inpatient Hospitalizations. Inpatient hospitalizations were also further examined, primarily to determine the rate of rehospitalization for this cohort of persons with schizophrenia. Since there was a relatively high percentage (70%) of Medicare eligibles in the Medicaid cohort of persons with schizophrenia (see table 1), it was postulated that hospitalizations may not have been reported equally for Medicare versus non-Medicare eligibles due to duplicate payor sources. Additionally, dual eligible (Medicaid and Medicare) persons are prevalent because schizophrenia is considered a disabling condition qualifying for supplemental security insurance (SSI), which automatically provides Medicaid benefits. If the disabling condition persists for 24 months or more, SSI recipients qualify for Medicare in lieu of Medicaid or become dually eligible depending on income thresholds. Because of these points, a chi-square test contrasting the expected and observed hospitalizations by Medicare eligibility was performed. Table 5 shows the observed hospitalizations by year by Medicare eligibility. The chi-square test ($p > 0.2$) indicated that there was no significant difference between the observed and expected frequencies of hospitalizations with regard to Medicare eligibility. Consequently, all subsequent analyses concerning hospitalizations were performed using all hospitalizations, including those of Medicare eligibles.

A total of 1,894 schizophrenia-related inpatient stays in 1991–93 were detected using this algorithm to identify hospitalizations for the schizophrenia cohort. A total of 477 recipients (7.4%) had at least one hospitalization in 1991, for a total of 660 hospital admissions. Of the 477 persons with schizophrenia who had an inpatient episode in 1991, 24 percent ($n = 115$) had a subsequent hospitalization in the 365-day period following their last hospitalization in 1991.

The average length of stay (LOS) for all baseline hospitalizations in 1991 was 9.97 days (standard deviation [SD] = 6.58). The average LOS for subsequent rehospitalizations for those with a hospitalization in 1991 was 9.9 days (SD 6.19). Thus, every mean LOS was near the overall average of approximately 10 days. Focusing on rehospitalizations, the 115 recipients had 165 admissions in the 1-year followup period with the mean days per recipient at 14.2 days per year (SD 12.2) for the 365 days following a baseline hospitalization.

Ambulatory Prescription Use. The 1991, 1992, and 1993 prescription files were used to determine the ambu-
Table 4. 1991–93 mental health center claims by activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of claims</th>
<th>Total (%)</th>
<th>Expenditures</th>
<th>Total (%)</th>
<th>Mean claim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day treatment (various)</td>
<td>47,638</td>
<td>32.47</td>
<td>$15,326,724</td>
<td>62.54</td>
<td>$321.73</td>
</tr>
<tr>
<td>Psychiatric/medical assessment and counseling</td>
<td>33,162</td>
<td>18.98</td>
<td>2,248,233</td>
<td>8.99</td>
<td>67.80</td>
</tr>
<tr>
<td>Individual counseling</td>
<td>31,124</td>
<td>17.27</td>
<td>2,153,888</td>
<td>8.21</td>
<td>69.20</td>
</tr>
<tr>
<td>Medication administration</td>
<td>27,236</td>
<td>14.82</td>
<td>1,595,136</td>
<td>6.31</td>
<td>58.57</td>
</tr>
<tr>
<td>Nursing assessment and counseling</td>
<td>9,652</td>
<td>5.49</td>
<td>847,974</td>
<td>3.56</td>
<td>87.85</td>
</tr>
<tr>
<td>Activities therapy</td>
<td>5,835</td>
<td>3.59</td>
<td>1,226,015</td>
<td>5.35</td>
<td>210.11</td>
</tr>
<tr>
<td>Group counseling</td>
<td>5,308</td>
<td>2.85</td>
<td>400,841</td>
<td>1.51</td>
<td>75.52</td>
</tr>
<tr>
<td>All other Current Procedural Terminology, Revision 4</td>
<td>8,250</td>
<td>4.54</td>
<td>2,728,617</td>
<td>3.53</td>
<td>330.74</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>168,205</strong></td>
<td><strong>100.00</strong></td>
<td><strong>$26,527,429</strong></td>
<td><strong>100.00</strong></td>
<td><strong>$157.71</strong></td>
</tr>
</tbody>
</table>

Table 5. Inpatient hospitalizations by year by Medicare eligibility of schizophrenia cohort

<table>
<thead>
<tr>
<th>Year</th>
<th>Medicare eligible</th>
<th>Not Medicare eligible</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>418</td>
<td>254</td>
<td>672 (33.1%)</td>
</tr>
<tr>
<td>1992</td>
<td>427</td>
<td>314</td>
<td>741 (36.5%)</td>
</tr>
<tr>
<td>1993</td>
<td>366</td>
<td>249</td>
<td>615 (30.3%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,211 (59.7%)</td>
<td>817 (40.3%)</td>
<td><strong>2,028</strong></td>
</tr>
</tbody>
</table>

Note. $x^2 = 3.08, df = 2, p = 0.214.

Prescription use in the cohort was further divided into two categories: a general central nervous system drug group and a psychotropics group (a subcategory within the central nervous system group). The central nervous system drug category included benzodiazepines, lithium, antidepressants, anti-Parkinson agents, and the psychotropic drugs included in the psychotropic subcategory. On average, schizophrenia recipients used 1.26 central nervous system prescriptions per month at an average cost of $37.52 in 1991 to $44.12 in 1993, a 44 percent increase over the 3-year period.

Analysis of the psychotropic subcategory revealed that the use of psychotropics increased over the 3-year period from 0.39 prescriptions per recipient per month in 1991 to 0.54 prescriptions per recipient per month in 1993. Interestingly, these agents apparently replaced other drugs in the schizophrenia cohort since the total drug consumption remained stable over the 3-year period. The number of prescriptions for each of the individual psychotropics and totals for all psychotropics appear in table 6. Generally, the phenothiazine drugs showed a small decline in usage over the 3 years while clozapine showed an increase in usage from 1,247 prescriptions in 1991 to 10,668 prescriptions in 1993. Table 6 displays the total and average per prescription paid for each of the psychotropics and for all psychotropics for each of the 3 years of the study. Some $1.7 million ($21.93/recipient/month) was spent in 1993 for these drugs, up from $1.3 million ($17.04/recipient/month) in 1992 and $0.7 million ($9.46/recipient/month) in 1991. Most of the increase in the psychotropic drug budget can be attributed to clozapine, which accounted for 57 percent of the total psychotropic expenditures for the cohort in 1993.

Limitations

Because of restrictions of age and continuous eligibility imposed by the inclusion criteria, the 6,443 Medicaid-eligible persons with schizophrenia may not be representative of the Medicaid schizophrenia population in general. We suspect that most of the persons with schizophrenia excluded from this analysis were eliminated because of the continuous eligibility restriction. This restriction was imposed to ascertain stable cost estimates, and in particular to accurately measure rehospitalization rates. It would be impossible to measure rehospitalizations for subjects not eligible for benefits in the periods for which a hospitalization may occur. Age restrictions were selected so this study could identify the expenditures of adults who may be primarily affected by schizophrenia. People over 50 are more likely to suffer from chronic medical illnesses such as diabetes, cardiovascular and pulmonary diseases, and cancer, in addition to other age-related illnesses. Additionally, the frequency of schizophrenia greatly...
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It must be noted that this study did not include the use of State-operated inpatient mental health facilities. There are 10 such facilities in Georgia that do provide care for Medicaid-eligible persons with schizophrenia without billing Medicaid. For this reason, “total” inpatient care could not be determined. The description of hospitalizations presented in this study are limited to all other inpatient schizophrenia-related stays, typically at tertiary hospitals that offer psychiatric inpatient services.

As with any retrospective claims-based study, there may be erroneous and missing claims. A possible concern, especially with a predominantly Medicare-eligible population, is the incorrect or partial reporting of the amount paid by Medicare or Medicaid. Validity checks were made to ascertain if any reporting of charges varied by Medicare eligibility. None were detected and the paid amounts reported by Medicaid appeared to fall within expected ranges for various claim types. Also, the reported Medicaid expenditures are just that: expenditures, not costs. To the extent expenditures can be compared with costs, our findings contribute information regarding the direct medical costs associated with schizophrenia. Taken together, our data give a clearer understanding of these costs and may help identify areas with increased likelihood of success for cost-reduction efforts in the treatment of schizophrenia.

Table 6. Number of and expenditures for psychotropic prescriptions dispensed

<table>
<thead>
<tr>
<th>Year</th>
<th>Claims</th>
<th>Mean $/Rx</th>
<th>Mean Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>11,192</td>
<td>$12.65</td>
<td>$141,531</td>
</tr>
<tr>
<td>1992</td>
<td>8,052</td>
<td>$9.52</td>
<td>$73,696</td>
</tr>
<tr>
<td>1991</td>
<td>8,651</td>
<td>$9.47</td>
<td>$77,737</td>
</tr>
</tbody>
</table>

Note—Rx = prescription. Other = other psychotropic drugs not elsewhere listed.

Discussion

Our results indicate that a relatively large number of persons with schizophrenia are continuously eligible for Medicaid. The 6 percent prevalence is substantially higher than the national average of approximately 1 percent, indicating that many persons with schizophrenia residing in Georgia are eligible for Medicaid benefits. But because the national average includes individuals over 50, our age-specific prevalence is not directly comparable. This finding of Medicaid eligibility is consistent with the poverty associated with the debilitating nature of this disease. As many as one in four persons with schizophrenia residing in Georgia are eligible for Medicaid benefits at one time or another, assuming that approximately 1 percent of the 6.5 million Georgia residents suffers from schizophrenia. Undoubtedly, persons with schizophrenia are channeled into the Medicaid programs by virtue of the disability associated with the disorder. With such a large proportion of the Georgia schizophrenia population participating in Medicaid, economic studies using these data bases are productive sources for inquiry since data of this decreases outside the third through fifth decade of life (McKenna 1994), which falls within the age restrictions selected for this study.
nature describe the medical use for a large cross section of persons with schizophrenia and contain patient-linkable information describing ambulatory, inpatient, and outpatient prescription use. These types of data would permit investigations using historical cohort designs, which are superior to cross-sectional correlate designs, to investigate variations in schizophrenia-related outcomes.

Persons with schizophrenia may gain Medicaid benefits in the State of Georgia through several mechanisms: qualifying for Aid to Families with Dependent Children (AFDC, welfare), qualifying as Supplemental Security Income beneficiaries, joint qualification for Medicare-sponsored Supplemental Security Disability Income (disability, Medicare), being medically needy (ineligible for AFDC but because of high medical expenses, eligible for Medicaid), being pregnant with an income less than 135 percent of the Federal poverty guideline, Omnibus Reconciliation Act of 1989, 1990 (Georgia Department of Medical Assistance 1994) and belonging to various other smaller targeted populations. Given the patchwork scheme to qualify for Medicaid benefits, many persons with schizophrenia may become eligible for Medicaid, although it is certainly not a common resource available to all persons with schizophrenia.

Within the schizophrenia cohort, nearly 40 percent of all Medicaid dollars went to schizophrenia-related claims in 1991 through 1993. Schizophrenia recipients, as identified by this cohort, were responsible for nearly $32 million, $35 million, and nearly $37 million in 1991, 1992, and 1993, respectively, for a total of over $103 million (total medical claims plus total prescription claims). This translates into a 3-year expenditure in excess of $16,000 per recipient in direct medical costs. As an example, the 1992 annual expenditures of $5,437 per recipient is more than double the 1992 average of $2,465 per recipient from the entire Medicaid-eligible sample (Georgia Department of Medical Assistance 1992).

The total schizophrenia-related Medicaid expenditures were $12.8 million, $14.9 million, and $14.5 million in 1991, 1992, and 1993, respectively. A 3-year total of $42.1 million for an average of $2,543 per recipient per year is obtained when the schizophrenia-related medical claims and psychotropic medications (tables 3 and 6) are combined. These are conservative estimates as they do not account for treating other related comorbid conditions such as various affective disorders and substance abuse that, if counted, would increase the burden of schizophrenia estimated by this study.

The vast majority of schizophrenia-related expenditures occurred from mental health centers, inpatient care, ambulatory prescriptions, nursing facilities, and physicians, with mental health centers and inpatient care clearly serving as the two primary cost drivers. These findings point specifically to the necessity of effectively targeting mental health centers and inpatient care as sources of cost reduction. Within the mental health centers, the majority of dollars are being used for day treatment and various aspects of counseling. Initiatives to provide more cost-efficient schizophrenia care may want to target these particular resource areas of care. There does, however, appear to be a move away from mental health centers as the primary treatment resource; percentages of claims from that service category consistently fell from 1991 to 1993.

While inpatient episodes accounted for only a small number of claims, they consumed a remarkable amount of the money spent on schizophrenia services relative to the number of claims. Additionally, a significant number of schizophrenia patients admitted to hospitals were at a greater risk for subsequent readmission. This risk greatly increased after more than one admission in a 12-month period (rehospitalization rate of 24% compared with baseline hospitalization rate of 7%). As such, these patients place an even greater burden on the already high relative cost of hospitalization within the Medicaid system. Reduction of multiple admissions to inpatient settings appears a likely target for cost containment efforts.

Psychotropic medication use increased over the 3-year period of this study. While this might suggest a greater cost effectiveness for treatment, the cost of the medications themselves has dramatically increased, primarily because of the increased use of more expensive atypical neuroleptics such as clozapine.

Some trends that may be worth noting include the total schizophrenia-related expenditures. As anticipated, expenditures were highest in 1992. Expenditures in 1991 were lower for two reasons: medical inflation and, given the continuous Medicaid eligibility criteria (1991–93) used to identify patients, newly diagnosed cases in 1992 would have received no schizophrenia-related Medicaid care in 1991. This trend is validated by the lower numbers of prescription and medical history claims and lower mean charges for those claims. Since recipients with an initial schizophrenia-related diagnosis in 1993 were not entered into the cohort, persons with schizophrenia could be followed for 1 year to calculate costs for at least 1 year after an initial episode of schizophrenia using the 1993 claims histories of those diagnosed in 1991 or 1992.

The evidence from the 1993 claims histories of this cohort indicates that ambulatory prescription use increased with a corresponding decrease in other medical use (table 3). Clearly, the schizophrenia cohort was being managed in a less intensive manner, relying more heavily on outpatient prescription use for control of the disorder. This finding would suggest the effectiveness of the psychotropics dispensed in the community. Of particular
interest in 1993 was the dramatic increase in the use of clozapine. The decrease in total medical use of nearly 18 percent (table 3: [78,567–64,637]/[78,567]) and the 32 percent decrease in hospital admissions in 1993 coupled with the increased use of clozapine suggests that atypical neuroleptics may offer some benefit to persons with schizophrenia that results in decreased overall costs for payers. This potential finding, however, must be interpreted with extreme caution and should only be used to generate future hypotheses as it is based exclusively on simple correlation.

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**The Authors**

Bradley C. Martin, Pharm.D., Ph.D., is Assistant Professor of Clinical and Administrative Sciences, Department of Pharmacy Care Administration; L. Stephen Miller, Ph.D., is Associate Professor of Clinical Psychology, Department of Psychology, University of Georgia, Athens, GA.

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**An Invitation to Readers**

Providing a forum for a lively exchange of ideas ranks high among the *Schizophrenia Bulletin*’s objectives. In the section *At Issue*, readers are asked to comment on specific controversial subjects that merit wide discussion. But remarks need not be confined to the issues we have identified. *At Issue* is open to any schizophrenia-related topic that needs airing. It is a place for readers to discuss articles that appear in the *Bulletin* or elsewhere in the professional literature, to report informally on experiences in the clinic, laboratory, or community, and to share ideas—including those that might seem to be radical notions. We welcome all comments.—*The Editors.*

Send your remarks to:

*At Issue*
Research Projects and Publications Branch
National Institute of Mental Health
5600 Fishers Lane, Rm. 10-85
Rockville, MD 20857