# State Mental Hospital Continuity of Care Study

## Addendum to Year One Report *

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## Background

This document is an addendum to the "State Mental Hospital Continuity of Care Study, Preliminary Report" dated March 30, 2001. The present document reports on the analysis of the AHCA Hospital Discharge Data and of the Medicaid Claims data. These data were not available in time to be presented in the original report. Refer to the original report for most details of the design of the study and the methods of analysis. In addition, we applied somewhat stricter criteria for elimination of forensic cases which resulted in a somewhat smaller sample size.

## Methods

In an effort to be more sure that we were examining cases in which the person was discharged to the community, we applied stricter criteria for elimination of forensic cases. Specifically, we eliminated cases for which the program component was indicated as forensic and cases that were discharged to a placement or address that indicated a criminal justice facility. This resulted in a reduction of the sample size from the 1211 reported in the original paper to 1120 in this present paper.

The classification scheme described in the original report that was used to categorize the IDS service event data was expanded to accommodate a comparable categorization of the Medicaid claims data and the AHCA Hospital Discharge Data. The list of categories was expanded and the complete list includes:

Case Management services
Psychiatric services
Residential Treatment services
Other MHSA Therapy services
Crisis / Inpatient (MHSA) services
MHSA Pharmacy claims
Non-MHSA Pharmacy claims
Outpatient Medical services
Inpatient Medical services
State Mental Hospital services
Transportation

The first five categories in this list were used to categorize the IDS service events in the original paper. In the previous scheme we also had a Crisis Evaluation category which is not included in this present scheme. The services for that category have been included in the Other MHSA Therapy services category in the present scheme.

The IDS system reports services in terms of minutes or days. The Medicaid claims data report services in terms of number of events of a particular type (which vary in terms of length of time depending on the specific service, some of which are days) and dollars. The AHCA

Hospital Discharge data report services in terms of days of hospitalization and total dollar amount for services associated with the hospital episode. As we reported before, there should be considerable (but not complete) overlap between the IDS and Medicaid claims data, but disentangling this overlap would be very complicated and likely imprecise. Therefore, we have not attempted to do that yet. On the other hand, the Medicaid and AHCA Hospital data could be combined. Thus, we chose to combine the AHCA Hospital and Medicaid claims data, but to report the IDS data separately.

To categorize the Medicaid claims and AHCA Hospital data we made the assumption that any services that were provided to the person during an inpatient hospital episode should be "bundled" together as a part of the hospital episode. Thus, the dollar amounts for all Medicaid claims that occurred during hospital episodes reported in the AHCA Hospital data were added into the total dollar amount for the hospital episode and these episodes were then described in terms of the number of days of hospitalization and the total dollar cost of the episode. (We have not yet developed an algorithm for avoiding double counting of claims paid by Medicaid that were included in the dollar figures reported in the AHCA Hospital Discharge data, so the total dollar amounts for these episodes are almost certainly an overestimate of the total cost of the episodes.) If the record indicated that the primary purpose of the episode was for the treatment of a physical medical problem, the episode was classified as an Inpatient Medical event. If the record indicated that the primary purpose of the episode was for the treatment of a mental health or substance abuse problem, then the episode was classified as a Crisis / Inpatient (MHSA) event. All episodes reported in the AHCA Hospital data were categorized into one of these two categories.

The remaining Medicaid claims were then categorized into one of the remaining categories based on an algorithm that was developed using the procedure code, provider type, appropriations code, and diagnosis information reported for each claim.

## Analysis and Results

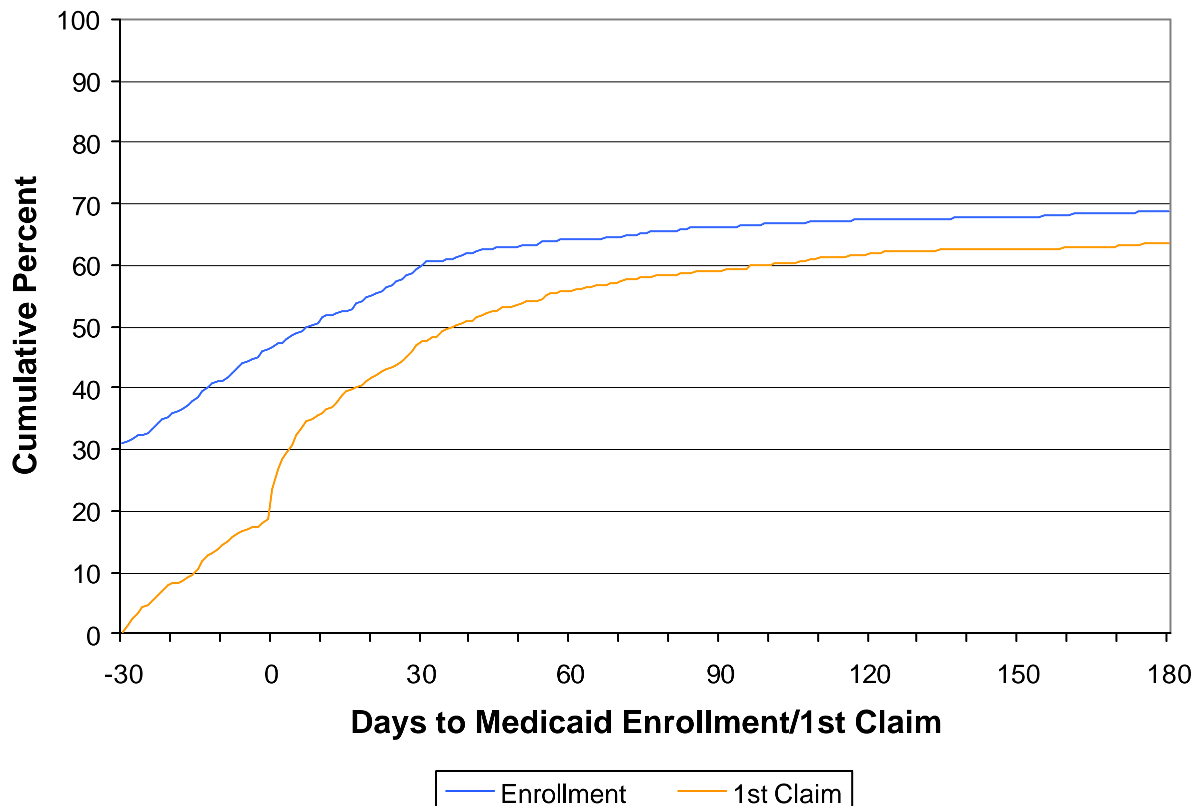
The stricter criteria for eliminating forensic cases resulted in our dropping an additional 91 cases from the previous sample leaving 1120 persons in the present sample. The demographic characteristics of the sample as a whole changed very little from that reported in the original paper. Specifically, the mean age at discharge was 43.5 years (SD = 13.9), 17.1% were aged 55 or over, 55.5% were male, and 71.2% were white (most of the remainder were black). These persons on average had experienced more than 3 state hospital episodes (up to and including the index episode), and the mean length of the index episode was 721.7 days (SD = 1639.4, and Median = 205 days). The most frequent discharge primary diagnoses given were schizophrenia (39.8%), schizoaffective disorder (25.5%), mood disorder (21.8%), dementia/cognitive disorder (4.9%), all other primary diagnoses (8.0%).

Following are a series of graphs that summarize data corresponding to that which was presented in Figures 1 through 10 in the original report (note that the figures in this present report are organized somewhat differently). These present graphs differ from the originals

primarily by the inclusion of the latency of onset information for the Medicaid/AHCA data along with the IDS data that was already presented. In some cases we also plot the latency to onset of the earliest event from all of the datasets combined (i.e., to the first occurrence of a particular service whether it is IDS, Medicaid or AHCA Hospital data).

Figure 1 presents the same data as Figure 1 in the original report with regard to the time until enrollment in Medicaid for persons discharged from the state hospital, but the present graph also presents data on the time until the first actual service received for which a Medicaid claim was paid.

Figure 1 -- Days from Discharge to Onset of Medicaid Benefits

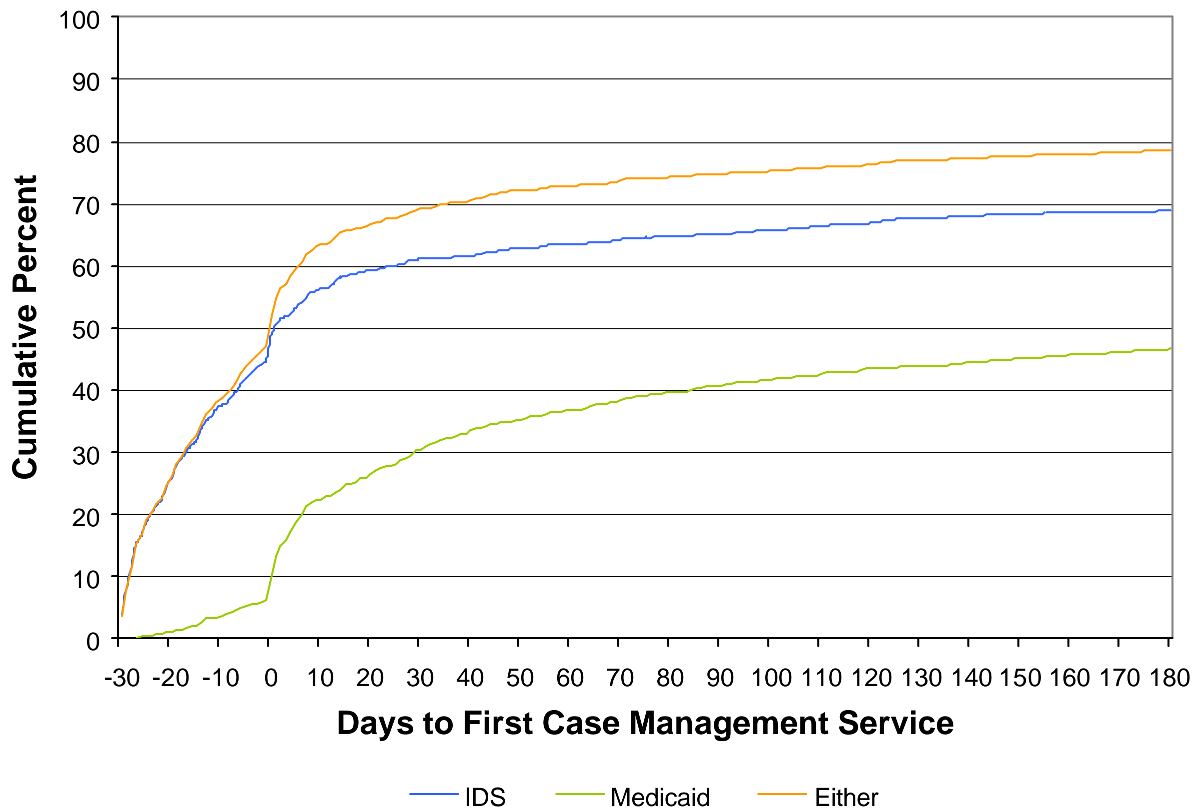



As noted in the original report, by six months after discharge nearly 69% of the sample was enrolled in Medicaid. Regarding the onset of paid claims, about 24% of the sample had at least one claim paid by the time of their official discharge date, and about 64% had at one least

one claim paid by six months after discharge. Thus, more than seven percent of those who were enrolled in Medicaid had no claims paid during the first six months following discharge.

Figure 2 in the present paper corresponds to Figure 2 in the original report. The IDS data remain nearly the same in that about 69% of persons received case management services that were reported in IDS during the six months following discharge. Fewer persons received case management services that were paid for by Medicaid (about 47%). However, when the IDS and Medicaid data are combined, we can see that almost 79% of the persons in our sample had received case management services during the six months following discharge.

Figure 2 -- Days from Discharge to First Case Management Event




It should be noted that while the data available for this study likely capture the large majority of services provided to these persons, there are still other possible venues for services or payors for services such that our data sets do not capture all the data. Some notable possibilities include private pay (the person or their family), Medicare, Veterans' Administration, private insurance, charitable organizations, and local governments. Especially with this last caveat in

mind, the present data suggest that most persons who are discharged from the state hospitals receive at least some case management services and these services are generally initiated in a timely fashion

Figure 3 -- Days from Discharge to First Psychiatric Event

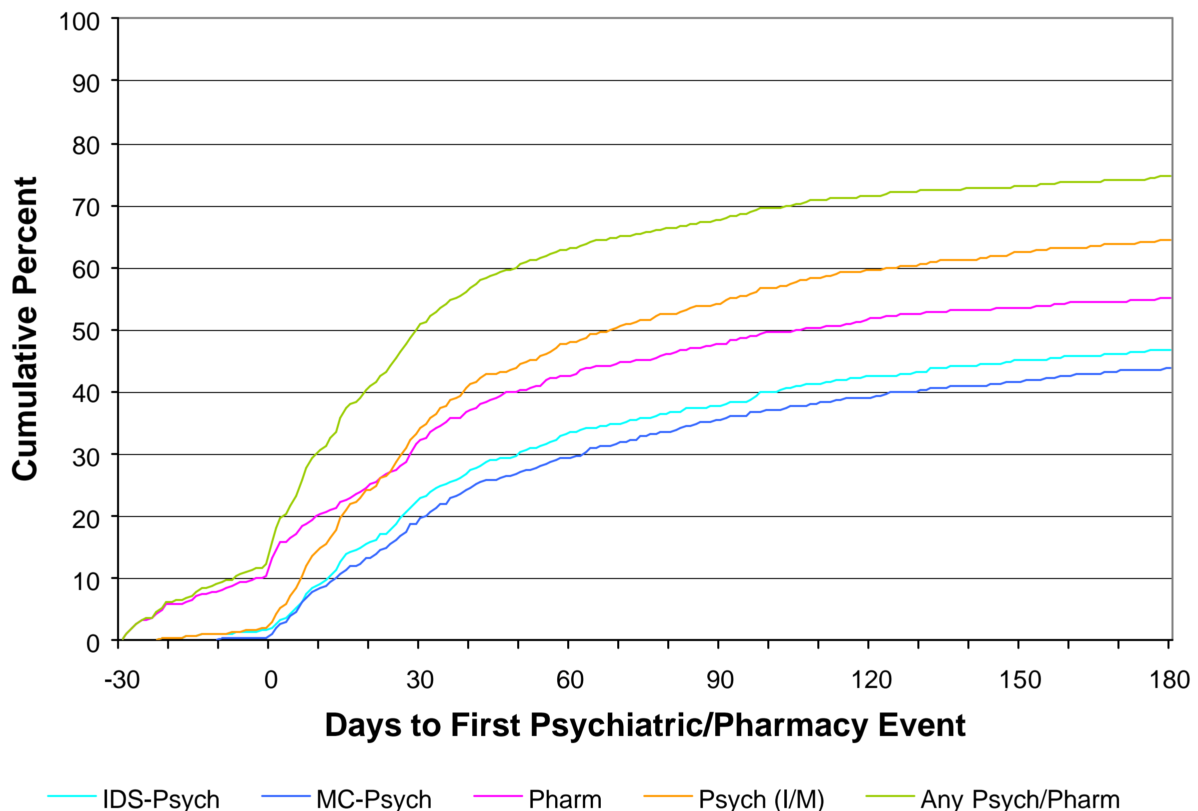



Figure 3 corresponds with Figure 3 in the original paper. In the present figure, however, we have not only included data on the latency to occurrence of the first psychiatric service event, but also data on the latency to occurrence of the first pharmacy claim. In this figure, the 'IDS-Psych' corresponds with the data presented in Figure 3 of the original paper, 'MC-Psych' is for the number of days until the occurrence of the first psychiatric service paid for by Medicaid, 'Psych (I/M)' is the first psychiatric service reported in either IDS or Medicaid, 'Pharm' is the time to the first pharmacy claim in Medicaid, and 'Any Psych/Pharm' is the time to the earliest event of any type reported in this figure. As was the case with case management services, there is considerable, but not complete, overlap between the IDS service event reports and the Medicaid claims for psychiatric service events. About 64% of the persons in this sample have an IDS psychiatric service event or a Medicaid claim for psychiatric service in the six months

following discharge (compare this with the 79% who received case management service). In addition, another 10% of the persons in this sample had a pharmacy claim paid during the six month period, but had no psychiatric service event indicated in the data. There at least two possible explanations for this latter observation-- a) the person was prescribed the medication by someone who does not report psychiatric services to IDS or Medicaid (e.g., a general practice physician), or the psychiatric service event was not reported to IDS or Medicaid (e.g., the psychiatrist billed Medicare).

Figure 4 -- Days from Discharge to First Mental Health or Substance Abuse Service Event of Various Types

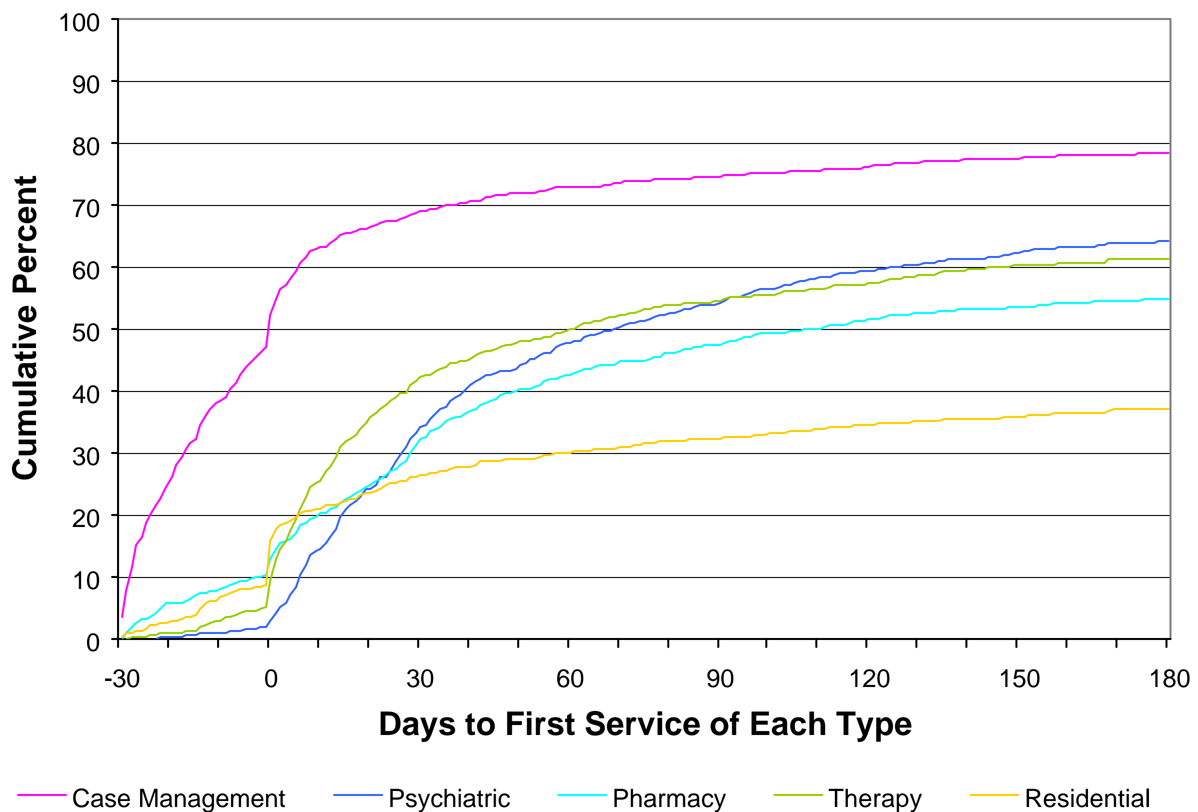


Figure 4 presents the latency to occurrence of the first service of each type for MHSA services considering both services reported in IDS and in Medicaid claims (a comparable figure does not appear in the original report). The inclusion of the data from Medicaid claims increases the percentage of persons who received each type of service when compared to the IDS data alone which were reported in the original report (i.e., about 10% - 20% of persons in the sample received services reported in Medicaid claims that were not reported in IDS for each type of service). However, the overall pattern remains much the same. Specifically, persons were very likely to receive case management services and these case management services were delivered in a timely fashion. However, significantly fewer persons received more specialized treatment services during the six-month period, and in a significant number of cases, this services were initiated several weeks or months after the person was discharged from the state hospital.

## Table 1 -- Units of IDS Service Received by Month after Discharge

| Service Type | Month prior to D/C | Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 | Six month total |
|---|---|---|---|---|---|---|---|---|
| Case Management (in minutes) | 285.25<br>339.39<br>180<br>501 | 649.49<br>775.50<br>445<br>654 | 503.90<br>579.59<br>335<br>592 | 462.36<br>578.57<br>285<br>562 | 435.79<br>555.25<br>270<br>560 | 428.30<br>478.57<br>285<br>515 | 391.21<br>434.51<br>255<br>509 | 2321.12<br>2571.49<br>1575<br>771 |
| Therapy (in minutes) | 1757.95<br>2966.20<br>120<br>44 | 1437.44<br>2968.87<br>120<br>332 | 1772.66<br>3081.84<br>120<br>240 | 2139.30<br>3468.66<br>120<br>196 | 2003.76<br>3189.77<br>240<br>165 | 1599.94<br>2992.22<br>120<br>166 | 1505.10<br>2545.89<br>195<br>144 | 4262.56<br>11012.93<br>180<br>519 |
| Residential Treatment (in days) | 13.37<br>10.78<br>12<br>46 | 18.65<br>11.32<br>21<br>177 | 18.79<br>11.72<br>23<br>169 | 19.12<br>10.97<br>21<br>157 | 18.49<br>11.45<br>22<br>159 | 20.12<br>11.05<br>25<br>147 | 19.36<br>11.26<br>25<br>147 | 71.62<br>63.87<br>48<br>263 |
| Psychiatric Service (in minutes) | 150.83<br>443.38<br>38<br>18 | 49.83<br>88.41<br>30<br>245 | 48.55<br>77.63<br>20<br>287 | 45.90<br>69.85<br>30<br>254 | 42.27<br>64.69<br>20<br>266 | 45.54<br>73.77<br>30<br>242 | 48.15<br>79.08<br>30<br>229 | 140.59<br>246.78<br>65<br>525 |

Each cell contains --

mean
standard deviation
median
number of cases

Table 2 -- Dollars for Medicaid Claims Paid for Service Received by Month after Discharge

| Service Type | Month prior to D/C | Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 | Six month total |
|---|---|---|---|---|---|---|---|---|
| Case Management | 212.50<br>200.30<br>171<br>70 | 419.73<br>351.13<br>324<br>326 | 307.55<br>285.26<br>236<br>321 | 277.91<br>273.79<br>175<br>326 | 275.65<br>291.45<br>193<br>351 | 263.71<br>243.88<br>184<br>319 | 265.47<br>252.33<br>193<br>334 | 1169.68<br>1110.59<br>814<br>522 |
| Other Therapy | 68.45<br>50.68<br>48<br>22 | 95.54<br>97.35<br>61<br>244 | 97.19<br>113.99<br>60<br>219 | 102.29<br>120.61<br>62<br>216 | 98.77<br>113.08<br>58<br>219 | 102.10<br>125.60<br>58<br>225 | 109.94<br>149.63<br>49<br>202 | 297.38<br>439.09<br>144<br>454 |
| Residential Treatment | 669.06<br>620.21<br>397<br>63 | 767.29<br>896.64<br>426<br>187 | 949.54<br>1163.60<br>578<br>197 | 963.40<br>1128.60<br>542<br>201 | 951.92<br>1056.53<br>527<br>199 | 983.11<br>1072.01<br>581<br>196 | 972.67<br>1115.30<br>527<br>194 | 3698.47<br>5632.48<br>1850<br>306 |
| Psychiatric Service | 45.07<br>33.34<br>38<br>5 | 102.53<br>196.41<br>59<br>209 | 86.98<br>123.25<br>39<br>226 | 88.70<br>138.89<br>37<br>207 | 86.18<br>143.68<br>37<br>205 | 69.85<br>126.48<br>37<br>201 | 81.42<br>133.95<br>37<br>184 | 217.50<br>345.35<br>104<br>489 |
| Pharmacy Claims | 186.60<br>142.68<br>166<br>117 | 274.51<br>215.91<br>239<br>301 | 284.50<br>240.00<br>249<br>399 | 300.63<br>241.31<br>250<br>399 | 298.84<br>253.38<br>260<br>414 | 301.49<br>262.39<br>266<br>403 | 329.61<br>277.91<br>266<br>401 | 1161.23<br>1014.66<br>883<br>616 |
| Crisis/Inpatient | 5968.00<br>.<br>5968<br>1 | 8955.88<br>7892.22<br>7521<br>43 | 11437.16<br>10379.29<br>8283<br>58 | 11718.35<br>10286.19<br>9411<br>70 | 10758.57<br>10981.99<br>7160<br>65 | 9540.26<br>9897.70<br>6201<br>82 | 11738.32<br>11708.00<br>7830<br>58 | 17252.74<br>18585.48<br>10236<br>234 |
| Total MHSA without Crisis/Inpt. | | | | | | | | 3785.40<br>4407.51<br>2451<br>713 |
| Total MHSA | | | | | | | | 8703.02<br>13189.58<br>4215<br>774 |

Each cell contains --
mean
standard deviation
median
number of cases

Table 1 corresponds to Table 3 in the original paper. The only difference is that there are fewer cases in the present analysis, and thus, the statistics differ slightly from the original. Also, due to some minor changes in the categorization scheme, for persons receiving "Therapy" services, the number who received such services increased and the average amount of such services received decreased. Refer to the original report for conclusions regarding this table.

Table 2 presents comparable data for the Medicaid claims and AHCA Hospital Discharge data, although in Table 2 the data pertain to the dollar amounts paid for these services (rather than length of service as was reported for IDS services in Table 1). For the four categories that the two tables have in common (i.e., case management, other therapy, residential, and psychiatric services) the numbers of persons receiving such services each month and for the six month period overall appear to be roughly comparable (somewhat more persons received such services reported in IDS during this period except for residential services for which somewhat more persons had Medicaid claims paid).

Again, the amounts of services paid for under Medicaid for case management services and for residential services appear to be very reasonable and appropriate for the persons that received such services (about 50% of the sample for case management and 25% for residential services). However, the amounts of claims paid for other therapy services and psychiatric services appear rather low. The low amount of claims for psychiatric services may be compensated for somewhat by the amount of claims paid for mental health pharmacy claims. About two thirds of the sample had pharmacy claims paid during the six month period with an average amount of $1,161.23 per person for the six month period.

In contrast, the amount of claims paid for inpatient/crisis services under Medicaid/AHCA is very large. (It should be noted that the figure in this table is likely to be a significant over-estimate of the actual claims paid because the "bundling" procedure described earlier probably resulted in double counting of some claim amounts. We plan to attempt to disentangle this overlap in the future.) Only about 20% of the sample had claims for such services during the six-month period, but for those persons an average of over $17,000 was paid for such services.

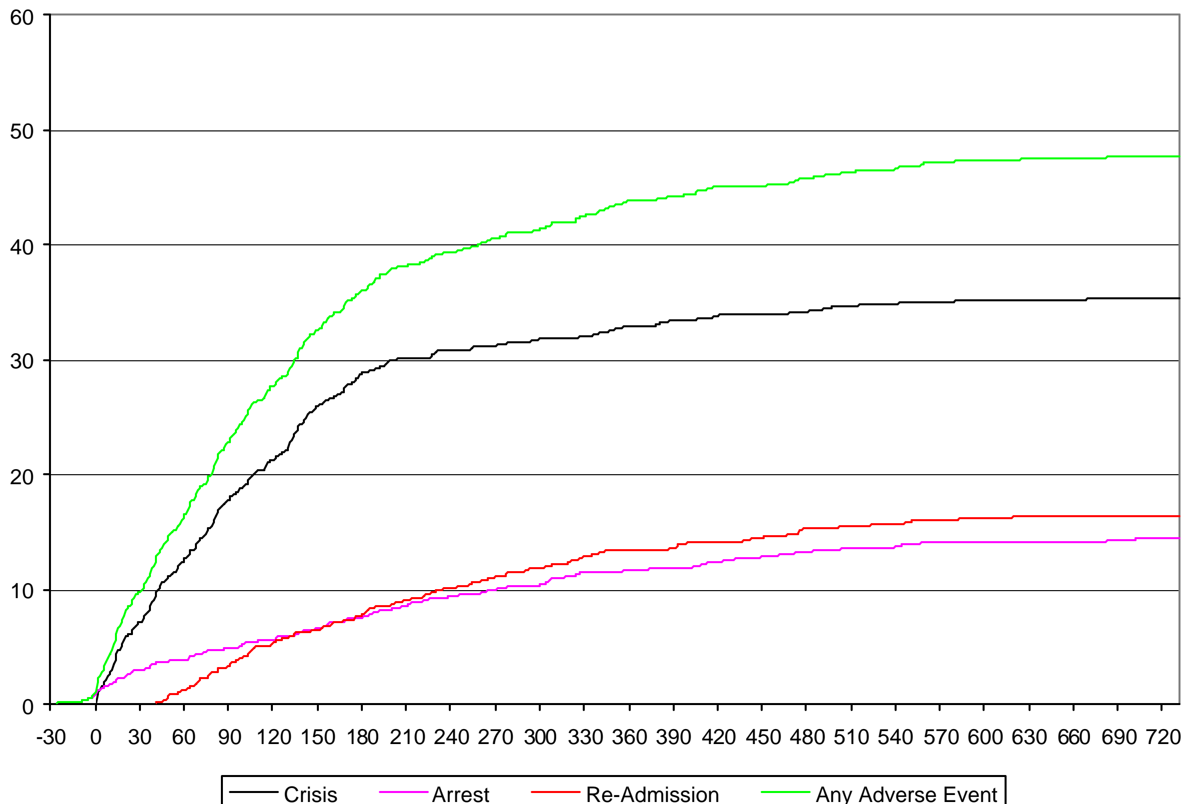
Of further concern regarding these data, is the fact that the distributions of values underlying these summary statistics are skewed such that in most cases a small number of persons receive large quantities of services and a substantially larger number of persons receive smaller quantities of services. For example, for IDS psychiatric services 525 persons received an average of about 140 minutes of service during the six month period; however, 261 persons in this group (almost half) received an hour or less of service during the six months. Similarly, for total Medicaid claims for MHSA services, 774 persons had an average of over $8700 in paid claims during the six month period; however, 14 persons had over $50,000 in paid claims while 163 persons had less than $200 per month in paid claims.

The data presented in Figure 5 correspond to the data presented in Figures 7-10 in the original report (note that the full follow-up period is portrayed in these figures). For Arrests and

Re-admissions, the data are nearly identical to the original report. However, because of the addition of inpatient episodes from the AHCA Hospital data, the number of persons experiencing crisis events increased considerably. The numbers of persons experiencing each type of adverse event over the full follow-up period were as follows:

| | |
|---|---|
| Readmitted to state hospital | 16.4% |
| Received crisis/inpatient services | 35.3% |
| Arrested after discharge | 14.4% |
| Felony arrest after discharge | 6.3% |
| Any adverse event | 47.7% |

Figure 5 -- Days from Discharge to First Adverse Event of Various Types




As was done in the original report, a series of analyses of variance (for continuous variables) or chi-square tests (for nominal-level variables) were conducted to determine if differences existed for the outcome groups (whether or not each type of adverse event was

experienced) on the following variables. (In interpreting the results, an α of .005 was used to correct for the effect on Type I error of performing this large number of analyses. Note that this is more generous than a true Bonferroni correction.). Also because of the very large number of analyses conducted, a brief summary of the results will be presented rather than a detailed outline of all the results.

- Case characteristic variables
  - Age
  - Gender
  - Race
  - Diagnosis
  - Number of Episodes
  - Length of most recent episode
  - Prior arrest history (total and felonies only)

- Intervention variables
  - Medicaid enrollment status at discharge (i.e., enrolled at discharge, enrolled subsequent to discharge, not enrolled post-discharge)
  - Latency of onset for Medicaid enrollment
  - Latency of onset for --
    - Case management services
    - Therapy services
    - Residential services
    - Psychiatric Services
  - Number of units (claims and dollars for Medicaid) of service during first month following discharge (prorated if necessary) for --
    - Case management services
    - Therapy services
    - Residential services
    - Psychiatric Services
  - Number of units (claims and dollars for Medicaid) of service during six months following discharge (prorated if necessary) for --
    - Case management services
    - Therapy services
    - Residential services
    - Psychiatric Services

This series of analyses showed that several of the case characteristic variables are associated with the experience of adverse events. Those persons with a diagnosis of schizoaffective disorder more likely to have crisis events ($?^2(4) = 29.05$, $p < .0001$) and to be readmitted ($?^2(4) = 17.03$, $p = .0019$) than were persons in the other diagnostic categories. Persons with prior arrest histories were more likely to again be arrested after discharge (for total prior arrests ($F(1,1112) = 40.68$, $p < .0001$); for prior felony arrests ($F(1,1112) = 52.76$, $p < .0001$)). Younger persons ($F(1,1112) = 15.12$, $p = .0001$) were also more likely to be arrested

after discharge. Gender and race were unrelated to adverse event experience, except that males ($?^2(1) = 10.30$, $p = .0013$) and blacks ($?^2(2) = 11.97$, $p = .0025$) were more likely to be arrested.

Very few of the modifiable, intervention variables were associated the experience of adverse events. Specifically, latency of onset of MHSA services was not related to experience of adverse events. Similarly, Medicaid enrollment status at discharge and latency to Medicaid enrollment were not related to the experience of adverse events. However, Medicaid enrollment status was related to whether a person received services reported in IDS. Specifically, persons who were not enrolled in Medicaid were *less* likely to receive such services whereas persons who became enrolled in Medicaid subsequent to discharge were *more* likely to receive such services, compared with persons who were enrolled in Medicaid at time of discharge.

The quantity of service received during the 30 days following discharge and during the entire six month follow-up period was unrelated to experience of adverse events, except that persons who experience crisis episodes received more IDS case management services both during the first month ($F(1,1112) = 9.59$, $p = .002$) and overall ($F(1,1112) = 10.11$, $p = .0015$) than persons who did not experience crisis events. Also, these same persons received more Medicaid psychiatric services during the first month (number of claims, $F(1,1112) = 15.76$, $p < .0001$; dollars paid, $F(1,1112) = 8.94$, $p = .0029$) and overall (number of claims, $F(1,1112) = 13.48$, $p = .0003$; dollars paid, $F(1,1112) = 15.86$, $p < .0001$) than persons who did not experience crisis events.

## Summary and Conclusions

This study reports on the analysis of several existing administrative data sets in order to examine issues related to the continuity of care in the community for persons discharged from the Florida state mental health hospitals. Persons were identified who were discharged to the community from the state hospitals from 7/1/98 to 12/31/99. Several indicators of continuity of care and indicators of adverse outcomes were tracked for these persons. These analyses yielded several major findings.

First, however, it is important to reiterate that there are some important shortcomings of this design that must be kept in mind when considering the findings. The validity of conclusions based on the analysis of administrative data sets is dependent on the adequacy of the existing data. While certain types of reporting errors can be identified and remediated (to a degree), other types of errors, particularly omission of reporting, usually cannot be identified or remediated. The data in this study probably overestimate the magnitude of the problem with follow-up care for the persons in this study since there are a variety of reasons that events might not be reported in the data sets that were analyzed. Namely, services may have been received but not reported (i.e., services may have been received from a provider that does not report to the DCF or bill Medicaid); the person may have been unavailable for services (e.g., the person died, moved out of state, or was reinstitutionalized elsewhere or jailed); finally, errors in reporting may have resulted in data set identifiers being mismatched. We have requested access to Medicare claims

data for Year Two; however, even with those data in hand we will lack data on services that were paid for by other sources such as the service recipient, the recipient's family, private insurance, charitable organizations, Veterans' Administration, or local government.

Most of the persons in this sample (about 88%) received at least some mental health or substance abuse service that was reflected in these data sets. For those persons who received services, most received case management services and those services appear to have been instituted in a timely fashion. However, fewer persons appear to have received other specialized services (particularly psychiatric and residential treatment), and for those who did receive such treatment services, those services were not initiated as promptly as case management services. There was some indication that a significant number of persons who received services received relatively small amounts of such services (compared with a smaller number of "heavy utilizers"). About 13% had no record of non-crisis, mental health treatment services following discharge.

We assume that our method of categorizing service events resulted in an overestimate of the amount paid for crisis and inpatient hospital episodes in the community. However, in our figures the amount derived for such episodes totals about 50% more than all the rest of the Medicaid claims combined. While these data are incomplete and imprecise, they certainly raise the question of whether the current service system tends to spend less money on regular community services and as a result spends more money on high-cost inpatient services for persons who have been discharged from the state hospitals.

Even in this relatively short follow-up period, a significant number of the persons in this study experienced adverse outcomes following discharge and within the time frame of the study. Nearly, one sixth of the sample was readmitted to one of the state hospitals. Further, 35.3% of the sample experienced inpatient or crisis admissions in the community, and 14.4% of the sample were arrested (6.3% on felony charges) during this time frame. Even within the shorter six-month follow-up period, over one third of the persons experienced an adverse event. Several case variables were found to be associated with the experience of adverse events. However, neither the latency of onset, nor the quantity of mental health services received in the community during the first six months following discharge appeared to be related to experiencing adverse events, except that those who experienced crisis events were more likely to have received case management services and psychiatric services in the community.

Nearly 70% of the sample was enrolled in Medicaid during the study period. Many of these were enrolled prior to discharge from the hospital. Enrollment in Medicaid (or lack thereof) did not appear to be related to the experience of adverse outcomes in this group.