

Efficacy and Cost Analysis of Assisted Outpatient Treatment (AOT)  
Program for Severely Mentally Ill Patients in a Small Alabama  
Community

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**PREVALENCE OF MENTAL ILLNESS IN US**

- Nearly one in five U.S. adults live with a mental illness (46.6 million in 2017) approximately 20% of the adult population .
- Any mental illness (AMI):** is defined as a mental, behavioral, or emotional disorder. AMI can vary in impact, ranging from no impairment to mild, moderate, and even severe impairment (e.g., individuals with serious mental illness as defined below).
- Serious mental illness (SMI):** is defined as a mental, behavioral, or emotional disorder resulting in serious functional impairment, which substantially interferes with or limits one or more major life activities. The burden of mental illnesses is particularly concentrated among those who experience disability due to SMI.
- An estimated 11.2 million adults aged 18 and above in the United States have severe mental illness ( SMI), this number represented 4.5% of all U.S. adults.
- Of those only 66.7% received mental health treatment in the past year.
- Reasons ?
- Source: <https://www.nimh.nih.gov/health/statistics/mental-illness.shtml>

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**EFFECT OF DEINSTITUTIONALIZATION IN US**

- At the peak between 1950-1960,the number of state hospital beds in the United States was 560,000 for an estimated 3.3 millions people with SMI.
- That has plummeted almost 97% by 2016.
- By 2016 there were 38,000 beds for an estimated 9 million people with SMI.
- 339 beds in 1955 to only 11.7 in 2016 per 100,000 general population
- Recommended minimum 50 per 100,000 general population
- 50% of those were occupied by forensic patients charged with or convicted of crimes.
- The number of psychiatric beds per 100,000 people in the United States ranks the nation 29th among the 34 countries in the Organization for Economic Cooperation and development.(including private hospitals) ( all European country's , Canada , USA , Australia New Zealand ).

Sources : 1. <https://www.treatmentadvocacycenter.org/key-issues/bed-shortages>  
2. Organization for Economic Cooperation and Development. (2014). Making mental health count

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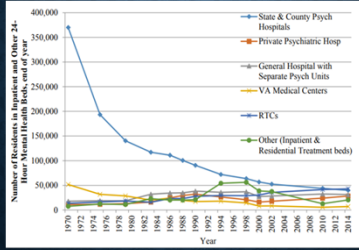
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**NUMBER OF RESIDENTS IN PSYCHIATRIC INPATIENT AND OTHER 24-HOUR RESIDENTIAL TREATMENT BEDS AT END OF YEAR, 1970 TO 2014.**  
SOURCE : WWW.NASMHFD.ORG




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**ADULT PSYCHIATRIC BEDS IN ALABAMA**

(SOURCE: GOING, GOING, GONE: TRENDS AND CONSEQUENCES OF ELIMINATING STATE PSYCHIATRIC BEDS, TREATMENT ADVOCACY CENTER, 2016)

Beds in 2016	Beds in 2010	Beds lost or gained	Beds per 100,000 people	Census of forensic patients	% of all beds occupied forensic	State ranking in beds per capita
383	1,119	-736	7.9	115	30.0	43-44

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**EFFECT ON COMMUNITY MENTAL HEALTH CENTERS**

- Increase in SMI patient population in the community ( living with family , group home , boarding home, shelters , homeless , in jail or prison).
- need for more psychiatric inpatient acute stabilization beds
- Affecting length of stay at acute inpatient facilities
- Quick decompensation leading to need for re-admission
- More patients waiting for same number of beds ( local Er, jail , shelter)
- Multiple decompensation leading to kindling effect and resistant to treatment and poor outcomes

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### LENGTH OF STAY AND READMISSION RATES IN 20 STATES FOR YEAR 2015 FOR PATIENT WITH SMI

- States with shortest LOS were nearly three times more likely to be readmitted into a state hospital within 30 days or 180 days of discharge than patients in states with the longest LOS.
- Eleven states had a median LOS of two weeks or less : 1 in 10 patients (10.8%) was re-hospitalized within 30 days of discharge, 2 in 10 patients (22%) were readmitted within 180 days.
- Nine states had a median LOS of four months or more : In those states, 2.8% (fewer than three in 100) patients were readmitted within 30 days of discharge, and 7.9% (fewer than eight in 100) were readmitted within 180 days.
- 10.8 vs 2.8%
- 22% vs 7.9%
- Source: Substance Abuse and Mental Health Services Association. (2015). SAMHSA Uniform Reporting System Output Tables. Retrieved from <http://www.das1.samsa.gov/das12urs.htm>

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### STABILIZATION OF MOST SMI PATIENTS

- Acute stabilization phase: Days to weeks
- MAINTENANCE PHASE: weeks to Months
  - Patients with schizophrenia who have recovered from an acute psychotic episode will usually reach a stable or maintenance phase in which psychotic symptoms are reasonably well controlled. The goal of maintenance antipsychotic treatment of schizophrenia is to minimize symptoms and functional impairments, avoid relapses, and promote recovery that allows self-determination, full integration into society, and pursuit of personal goals.
- Relapse prevention: Months to Years

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### EFFECT ON EMERGENCY ROOMS

- One in eight ED visits now involves a psychiatric emergency.
- Between 2006 to 2013 there is approximately cumulative 50% increase in ER visit with
  - Depression, anxiety or stress reactions
  - SUDs
  - Psychotic disorder or bipolar disorders

Source : HEALTHCARE COST AND UTILIZATION PROJECT, December 2016. <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb216-Mental-Substance-Use-Disorder-ED-Visit-Trends.pdf>

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### HOMELESSNESS & SMI

- As of 2015 data on a single night people with homelessness in the United States is 564,708 ( 0.06%) total population.
- of those 104,083 (24%) were identified having severe mental illness (SMI).

**Top 3 SMI in homeless :**

- Schizophrenia
- Bipolar disorder
- Major depressive d.o
- With or with out comorbid substance use d.o

• Source : [2015 Annual Homeless Assessment Report to Congress](https://www.hshhs.gov/2015-Annual-Homeless-Assessment-Report-to-Congress), <https://www.hshhs.gov/2015-Annual-Homeless-Assessment-Report-to-Congress>

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### SMI PATIENTS IN JAIL AND PRISON SYSTEMS

- Approximately 4-5 % of federal prison population suffering from SMI.1
- state prisons and county jails hold as many as 10 times more people with serious mental illnesses than state psychiatric hospitals.2
- In 2012, there were estimated to be 356,268 inmates with severe mental illness in prisons and jails.
- There were also approximately 35,000 patients with severe mental illness in state psychiatric hospitals

• Source : 1. United States Government Accountability Office : [GAO-13-182 Inmates with Serious Mental Illness](https://www.gao.gov/assets/330/330182), FEB 20, 2013.  
2. Toney EF, Zdanowicz MT, Kennell AD, et al. [The Treatment of Persons With Mental Illness in Prisons and Jails](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4081444/), 2014.

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### WHAT IS THE SOLUTION FOR CURRENT PROBLEM

- currently available and widely used programs in the country
- OPC ( Outpatient Civil Commitment)
- ACT ( Assertive Community Treatment)

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### OUTPATIENT COMMITMENT( OPC)

• Involuntary outpatient commitment (OPC) is a civil court procedure intended to aid persons with severe mental illness who require more intensive intervention to adhere to outpatient treatment to prevent deterioration of the ability to function independently and worsening of mental distress while maintaining a less restrictive environment.

• Criteria :

- Individual suffering from SMI
- without treatment individual will continue to suffer mental distress and deterioration of the ability to function independently.
- Individual unable to make a rational and informed decision concerning need for treatment due to poor insight.
- 46 states and district of Columbia has some form of OPC , except Connecticut, Maryland, Massachusetts and Tennessee

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### OPC- LIMITATION

- Available only five day a week
- Available only working hours 8 am to 4:30 pm
- Focuses on providing transportation to out patient appointments and medication assistance
- Mainly low funding and lack of resource and poor communication with other agencies

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### ASSERTIVE COMMUNITY TREATMENT (ACT) LIMITATIONS

- intensive outreach or case management model that targets difficult-to-engage or refractory schizophrenia patients , Rarely Other SMI patients and patients with dual diagnosis.
- Its services are limited to very few core patients regardless of civil commitment
- Very high staff to patient ration leads to high cost ( approximately 10 staff for 100 patients)
- Highly focused on pharmacotherapy stabilization (LAI)
- Focused mainly on acutely symptomatic and incrisis patients.
- little effect on patients' social and vocational functioning, substance use, and satisfaction with services.

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## HYPOTHESIS

- Effective Implementation of outpatient commitment can improve the outcomes in providing and delivering care to Severally Mentally ill ( SMI) , with the new model of Assisted outpatient Treatment program(AOT).

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## THE SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMINISTRATION (SAMHSA)

- Announced Assisted Outpatient Treatment(AOT)Grant Program for Individuals with Serious Mental Illness( SMI) in 2016
- Established by the Protecting Access to Medicare Act of 2014 (PAMA), Section 224
- This is a 4-year pilot program
- Goals of the program
  1. Reduce the incidence and duration of psychiatric hospitalization,
  2. reduce homelessness,
  3. reduced incarcerations, and interactions with the criminal justice system
  4. improving the health and social outcomes of individuals with a serious mental illness (SMI).
- 17 community mental health center across the country awarded the grant to implement the program

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## WHAT IS ASSISTED OUTPATIENT TREATMENT(AOT)

- Criteria for AOT is similar to OPC but the services offered were different.
- It is customized to individual patient's needs
- it provides wider range of services ( show in next slide)
- Staff available from 9am to 9pm ( extended hours )
- 7 days a week
- Each patient has encounter with the AOT staff twice a week at minimum through out the length of the enrolment ( key to preventing or early intervention if decompensation noticed)

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### AOT TEAM CONSIST OF

- Two case mangers
- One therapist
- One nurse
- Medical Doctor/ NP
- IT specialist ( part-time )

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### SERVICES PROVIDED BY AOT

1. Transportation to appointments and other social needs to help with stability
2. Ex: Mental health , Medical , pharmacy , social security office etc
3. Visit to their home/apartment/ twice a week at minimum
4. Help getting prescription medication
5. Help getting temporary housing /permanent housing
6. Assist in getting health and social security benefits with benefits specialist
7. Providing indivual therapy and basking living skills , education and linkage to community resources at each visit
8. Help with managing the disability money and help with paying bills (utilities , phone).
9. Assist in crisis situation by scheduling to see MD/NP on walk in basis
10. Administering LAI medication on field like ACT if needed or collaborate with ACT team .
11. Assist with crisis situation when encounter with law enforcement or end up in ER.
12. AOT nurse goes out and administer LAI and also do brief physical exam and help with referral to PCP and other specialist and educates about diet , medication and physical exercise, smoking cessation at each visit .

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### THE GOALS OF THE BALDWIN COUNTY AOT PROGRAM

1. Reduce the incidence and duration of psychiatric hospitalizations
2. Reduce the incidence of homelessness for individuals with a serious mental illness.
3. Reduce the interactions with the criminal justice system and maintain treatment within the least restrictive environment.
4. improve access to and compliance with healthcare
5. improving health outcomes
6. improve social outcomes for all participants.

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### METHODS

- between January 2017 to August 2018
- 65 consumers who were enrolled in the AOT program
- either upon discharge from psychiatric hospitalization or as a step up referral from outpatient
- The data examined included 12 months before and following enrollment
- Data were collected to measure the incidence and duration of psychiatric hospitalizations, emergency room visits, interactions with the criminal justice system, incidence of homelessness, and access to and compliance with healthcare.

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### SOURCES OF DATA INCLUDED

- SAMHSA's Performance Accountability and Reporting System (SPARS)
- Alta Pointe Health Systems' electronic health record
- Data provided by local law enforcement
- Local emergency medical departments.

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### DATA ANALYSIS

- The pre- and post-intervention groups were conducted utilizing a paired Student's t-test.

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## PSYCHIATRY HOSPITALIZATIONS

- The 65 participants underwent 96 hospitalizations in the twelve months before AOT enrollment for a total number of 1610 bed days averaging 24.77 days per patient.
- In the year following enrollment in AOT, 10 participants required 16 hospitalizations for a total of 315 days averaging 4.85 days per patient.
- This is an 83.3% reduction in the number of hospitalizations and 80.4% reduction in bed days.

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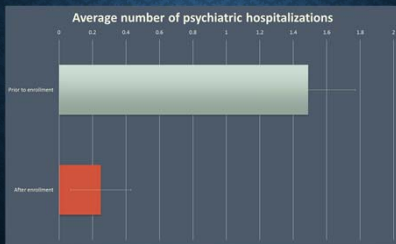
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FIG. 1. AVERAGE NUMBER OF HOSPITAL ADMISSIONS PRE- (M = 1.49, SD = 1.15) AND POST-ENROLLMENT (M = 0.25, SD = 0.73) IN AOT PROGRAM. PAIRED STUDENT'S T-TEST, N = 65, P < 0.0001.



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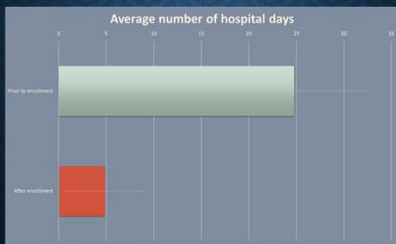
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FIG. 2. AVERAGE NUMBER OF HOSPITAL DAYS PRE- (M = 24.77, SD = 32.63) AND POST-ENROLLMENT (M = 4.85, SD = 17.02) IN AOT PROGRAM. PAIRED STUDENT'S T-TEST, N = 65, P < 0.0001.



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### ER VISITS

- 16 participants had 27 visits to the emergency department 12 months before AOT enrollment
- In the year following AOT enrolment, 9 participants had a total of 12 ER visits
- A 44.4% reduction in emergency room visits.

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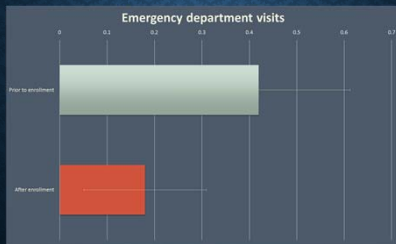
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FIG. 3. AVERAGE NUMBER OF EMERGENCY DEPARTMENT VISITS PRE- (M = 0.42, SD = 0.79) AND POST-ENROLLMENT (M = 0.18, SD = 0.53) IN AOT PROGRAM. PAIRED STUDENT'S T-TEST, N = 65, P = 0.0021.



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### LAW ENFORCEMENT ENCOUNTERS

- In the 12 months before enrollment, there were 80 reported law enforcement encounters in our sample group,
- which reduced to 29 encounters during the 12 months following enrollment.
- A 84% reduction in encounters with law enforcement

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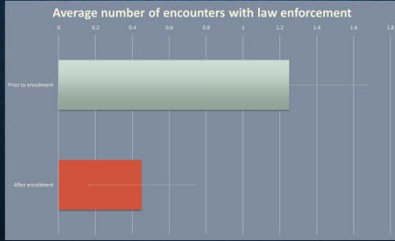
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FIG. 4. AVERAGE NUMBER OF LAW ENFORCEMENT ENCOUNTERS PRE- (M = 1.25, SD = 1.75) AND POST-ENROLLMENT (M = 0.45, SD = 1.19) IN AOT PROGRAM. PAIRED STUDENT'S T-TEST, N = 65, P = 0.0028



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## RESULTS

- Changes in DLA-20 scores at program enrollment and three months later, though improved, were not statistically significant.

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FIG. 5. AVERAGE DLA-20 SCORES AT TIME OF ENROLLMENT (M = 30.15, SD = 6.43) AND 3 MONTHS FOLLOWING ENROLLMENT (M = 32.24, SD = 9.91) IN AOT PROGRAM. PAIRED STUDENT'S T-TEST, N = 62, P = 0.0601



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### HOMELESSNESS

- Before enrollment, 4 participants were homeless for a total of 477 days.
- In the year following program enrollment, 3 participants were homeless for a total of 56 days.
- 88 % reduction

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### ACCESS TO PRESCRIPTIONS MEDICATION

- Only 15 participants had access to prescription medications and were not consistently taking them.
- Since enrollment, all 56 participants had access to a full spectrum of psychiatric medications through various prescription assistance programs and grant funds, as well as medical medication.
- Medication compliance increased by 93%.

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### DISCUSSION

- Our analysis of the Baldwin County AOT program indicates a statistically significant reduction in hospital readmission rates, and the average number of hospital days utilized relieving the strain as mentioned above on our inpatient system and local Emergency rooms.

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### COST OF IMPLEMENTING MORE RESOURCE-INTENSIVE OUTPATIENT ASSISTANCE MODELS LIKE AOT

- Average cost of a visit to the local emergency department is \$1957.00.
- The average daily cost to taxpayers to house an inmate in jail is \$55.00.
- The average daily cost of acute inpatient psychiatric treatment is \$750.00
- we calculate a cost savings of over \$1,004,000 in these three areas alone
- The funding for 6 months is \$250,000 means \$750,000 saving for the community , means three dollar's saved for each dollar invested. While providing the best care patient needed.

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