

# ***Application of Two Risk Adjustment Techniques in Multi-Agency Outcome Comparisons***

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# General Well-Being Schedule (GWB) Positive Mental Health Index

Instrument has good to excellent psychometric properties

## **RELIABILITY:**

- Internal Consistency (Cronbach's alpha): [.87 -- .95]  
1996 study (n = 352) -- [.95]
- Test-retest (3 month intervals) [.69 -- .85]

## **VALIDITY:**

- High correlations with self-report measures of psychopathology / adjustment  
e.g, Beck & Zung depression scales, various MMPI scales, OQ45, etc. [.49 -- .88]
- 1996 study: GWB correlated .88 with OQ45.1 (n = 508)
- Good correlations with [.30 -- .53] with 'real' life events such as: self-reported 'nervous breakdowns,' diagnosed "severe" mental health problems, and consultations with mental health professionals
- Reliably differentiates general adult population samples from those drawn from treatment settings

## **SENSITIVITY TO CHANGE:**

- Sensitivity to change is positive; scores have been demonstrated to improved as a function of in outpatient, inpatient and partial hospital/day-treatment programs

## **General Well-Being Schedule (GWB) Positive Mental Health Index**

- 10 Item self report scale: Addresses general well-being, emotional/behavioral control, energy level, depression
- Indicates symptoms, adjustment, level of impairment
- Higher scores indicate positive adjustment, lower scores represent problems, impairment, adjustment difficulties
- Covers full range of functional adjustment  
    "Normal -- -- -- -- -- -- -- -- -- -- "Severe Impairment"
- Applicable to a wide range of mental health diagnoses
- Appropriate for adults and youth 12 years and older
- National, state and local norms available for general population
- Used in national studies planning for mental health insurance
- Recommended by national experts and conferences for use in mental health service outcomes and effectiveness

**TABLE 1**

**Final Matched Time One/Time Two Sample  
Case Inclusion and Loss by CMHC**

<b>Row</b>	<b>CMHC</b>	<b>Adult Admissions</b>	<b>Matched T1/T2 Cases</b>	<b>Percentage Loss</b>	<b>Qualifying Matches</b>	<b>Percentage Loss</b>
1	<i>Bear River</i>	1,548	608	60.7	527	13.3
2	<i>Davis</i>	3,783	758	80.0	686	9.5
3	<i>Central</i>	1,378	297	78.5	250	15.8
4	<i>Wasatch</i>	4,349	853	80.4	733	14.1
5	<i>Four Corners</i>	2,045	346	83.2	261	24.6
6	<i>Valley</i>	15,244	1,849	87.9	1,507	18.5
7	<i>Southwest</i>	2,592	141	94.6	119	15.6
8	<i>Weber</i>	12,812	277	97.8	208	24.9
	<i>Average of CMHCs</i>			84.1		17.0
	<b>Total Sample</b>	43,751	5,129	88.3	4,291	16.3

<sup>1</sup> Two-tailed z-test of difference between proportions, ( $p < .05$ ), (Horowitz, 1974).

**TABLE 2**

***State-wide Follow-up Sample:  
Client Gender Representativeness***

<b>Variable</b>	<b>Admissions</b>		<b>Matched T1/T2 Sample</b>	
	<b>N</b>	<b>Percentage</b>	<b>N</b>	<b>Percentage</b>
<i>Male</i>	22,549	51.5	1702	39.7
<i>Female</i>	21,202	48.5	2589	60.3
<b>TOTALS</b>	43,751	100.0	4291	100.0

**TABLE 3**

***State-wide Follow-up Sample:  
Client Age-Group Representativeness***

<b>Variable</b>	<b>Admissions</b>		<b>Matched T1/T2 Sample</b>	
<b>Age Group</b>	<b>N</b>	<b>Percentage</b>	<b>N</b>	<b>Percentage</b>
<i>18-25</i>	11,975	27.4	1,083	25.2
<i>26-35</i>	14,283	32.6	1,364	31.8
<i>36-45</i>	10,681	24.4	1,072	25.0
<i>46-60</i>	4,942	11.3	590	13.8
<i>61 +</i>	1,870	4.3	182	4.2
<b>TOTALS</b>	43,751	100.0	4,291	100.0

**TABLE 4**

***State-wide Representativeness:  
Client Selected Racial Group***

<b>Variable</b>	<b>Admissions</b>		<b>Matched T1/T2 Sample</b>	
<b>Race</b>	<b>N</b>	<b>Percentage</b>	<b>N</b>	<b>Percentage</b>
<i>American / Alaskan Native</i>	871	2.0	62	1.4
<i>Asian / Pacific Islander</i>	351	.8	46	1.1
<i>Black</i>	1,093	2.5	58	1.4
<i>White</i>	34,254	78.2	3,687	85.9
<i>Other</i>	3,214	7.4	99	2.3
<i>Missing</i>	3,968	9.1	339	7.9
<b>TOTALS</b>	43,751	100.0	4,291	100.0

**TABLE 7**  
**State-wide Representativeness:**  
**Diagnostic Grouping**

Variable Principal Diagnostic Group <sup>1</sup>	Admissions		Matched T1/T2 Sample	
	N	Percentage	N	Percentage
<i>Substance Abuse</i>	9,446	21.6	895	20.9
<i>Bipolar</i>	3,006	6.9	231	5.4
<i>Major Depression</i>	8,114	18.5	1,245	29.0
<i>Dysthymia</i>	3,458	7.9	330	7.7
<i>Schiz / Psych</i>	2,253	5.2	208	4.8
<i>Anxiety</i>	1,507	3.4	236	5.5
<i>Personality Disorder</i>	1,153	2.6	119	2.8
<i>Adj Disorder</i>	5,208	11.9	779	18.1
<i>Miscellaneous</i>	1,850	4.2	140	3.3
<i>No Diagnosis</i>	7,756	17.7	108	2.5
<b>TOTALS</b>	43,751	100.0	4,291	100.0

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<sup>1</sup> See Appendix D for notes on composition of diagnostic groupings.

**TABLE 8**

***State-wide Representativeness:  
Seriously & Persistently Mentally III Status (SPMI)***

<b>Variable</b>	<b>Admissions</b>		<b>Matched T1/T2 Sample</b>	
	<b>N</b>	<b>Percentage</b>	<b>N</b>	<b>Percentage</b>
Yes	10,608	24.2	1,287	30.0
No	33,143	75.8	3,004	70.0
<b>TOTALS</b>	<b>43,751</b>	<b>100.0</b>	<b>4,291</b>	<b>100.0</b>

<sup>1</sup> Classification based on the Utah Seriously and Persistently Mentally III Scale

**TABLE 10**

**State-wide Representativeness:  
Client Medicaid Eligibility**

<b>Variable</b>	<b>Admissions</b>		<b>Matched T1/T2 Sample</b>	
	<b>N<sup>1</sup></b>	<b>Percentage <sup>1</sup></b>	<b>N</b>	<b>Percentage</b>
Yes	7,838	27.5	1,333	31.1
No	19,308	72.5	2,958	68.9
<b>TOTALS</b>	<b>27,146</b>	<b>100.0</b>	<b>4,291</b>	<b>100.0</b>

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<sup>1</sup> The counts and percentages for Medicaid eligibility in admissions are based on 6 of the 8 CMHCs reporting data. The admissions data for two CMHCs did not contain funding source information, although it was reported for the outcome samples.

**TABLE 12****Admission (T1), Follow-Up (T2) and  
Difference GWB Scores by CMHC**

<b>CMHC</b>	<b>Time of Measurement</b>				<b>T2 - T1 Differences <sup>1</sup></b>	
	<b>Admission - T1</b>		<b>Follow-Up - T2</b>		<b>T2-T1<sup>2</sup></b>	<b>Significant?</b>
	<b>Mean</b>	<b>SD</b>	<b>Mean</b>	<b>SD</b>		
<i>Bear River</i>	21.16	10.51	28.28	8.61	7.12	Yes
<i>Weber</i>	20.37	9.90	25.76	9.95	5.39	Yes
<i>Davis</i>	24.23	10.38	30.11	9.08	5.88	Yes
<i>Valley</i>	23.18	13.12	30.54	12.24	7.37	Yes
<i>Wasatch</i>	21.55	9.79	26.92	7.62	5.37	Yes
<i>Central</i>	21.35	11.45	27.89	11.16	6.54	Yes
<i>Southwest</i>	24.25	11.14	28.91	9.27	4.66	Yes
<i>Four Corners</i>	21.99	12.27	30.20	11.83	8.21	Yes
<i>Average of all CMHCs <sup>3</sup></i>	22.26	11.07	28.58	9.97	6.32	
<b>Total Sample <sup>4</sup></b>	<b>22.53</b>	<b>11.57</b>	<b>29.12</b>	<b>10.49</b>	<b>6.59</b>	<b>Yes</b>

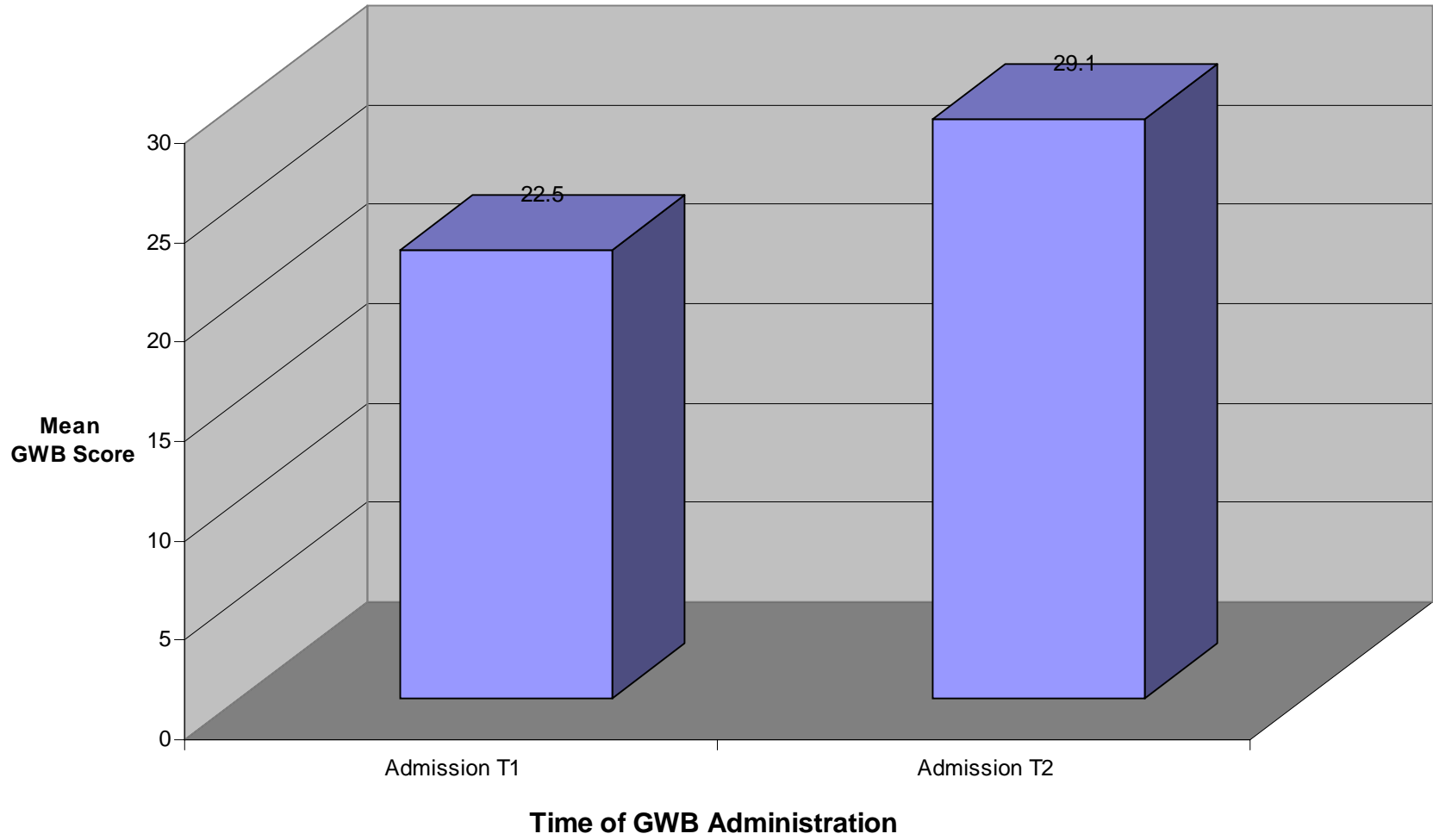
<sup>1</sup> Differences evaluated by paired, two-tailed t-test, (alpha <.0001 for each CMHC).

<sup>2</sup> Positive values represent change in desired direction.

<sup>3</sup> This row lists the average of the values across all CMHCs.

<sup>4</sup> This row lists the aggregated or total sample values.

**Figure 1**  
**Mental Health Treatment Outcomes: 1996-98**  
**Average State-wide GWB Scores at T1 & T2**

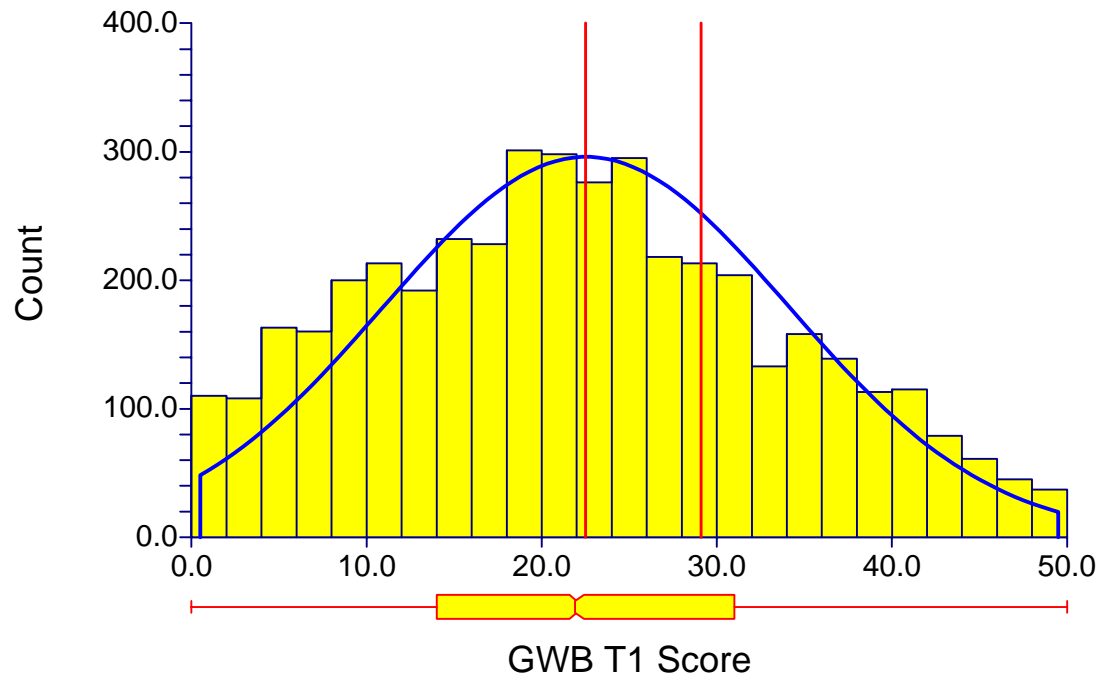


# Figure 2A

Mental Health Outcomes: 1996-98

Distribution of T1 GWB Scores

Average GWB Score  
Time 1 Time 2

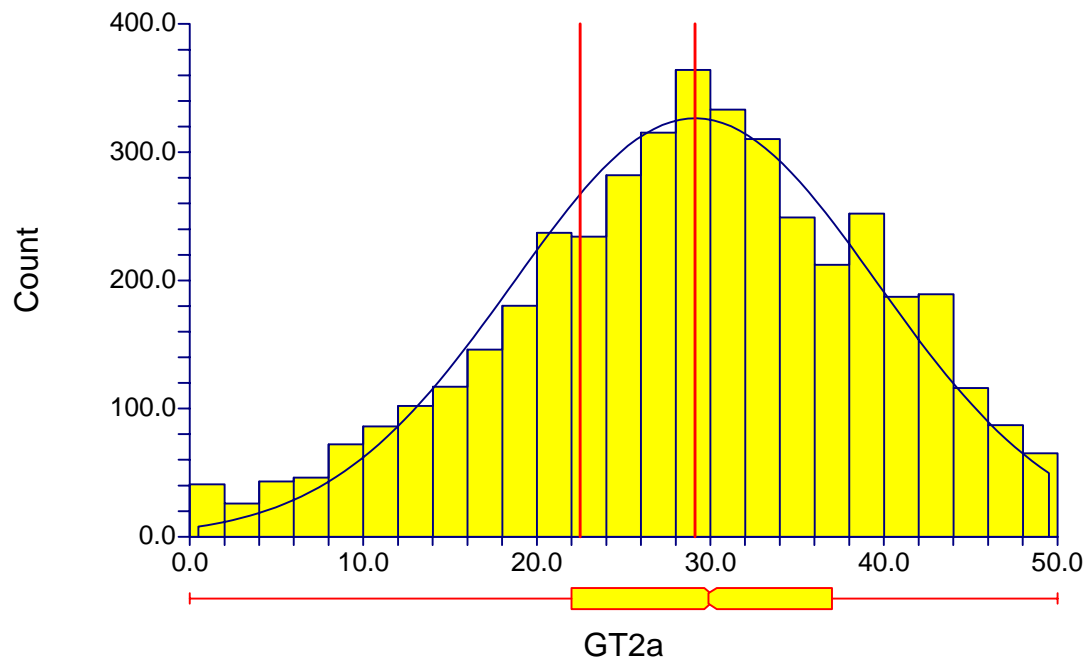


# Figure 2B

Mental Health Outcomes: 1996-1998

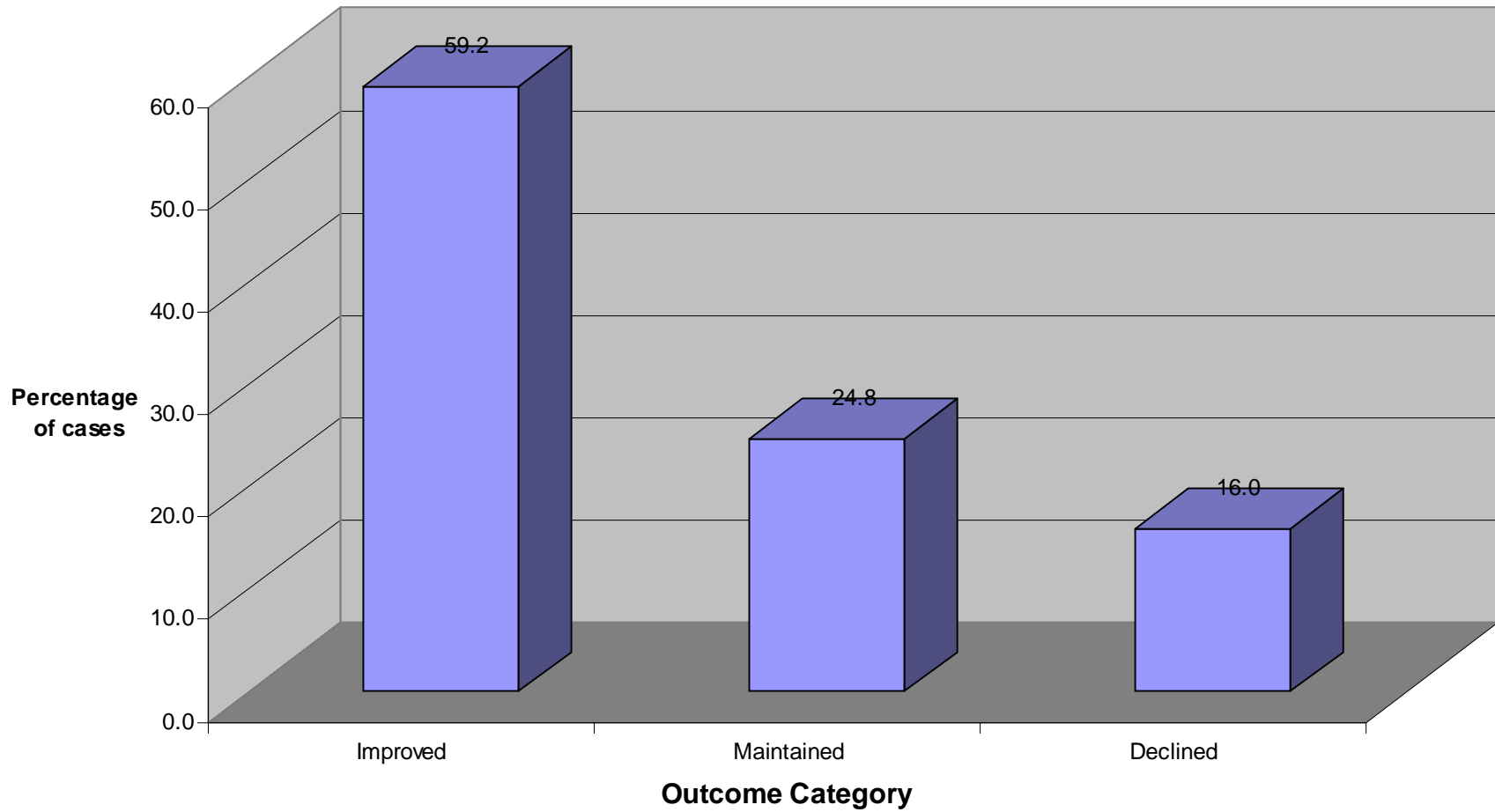
Distribution of T2 GWB Scores

Average GWB Score  
Time 1    Time 2



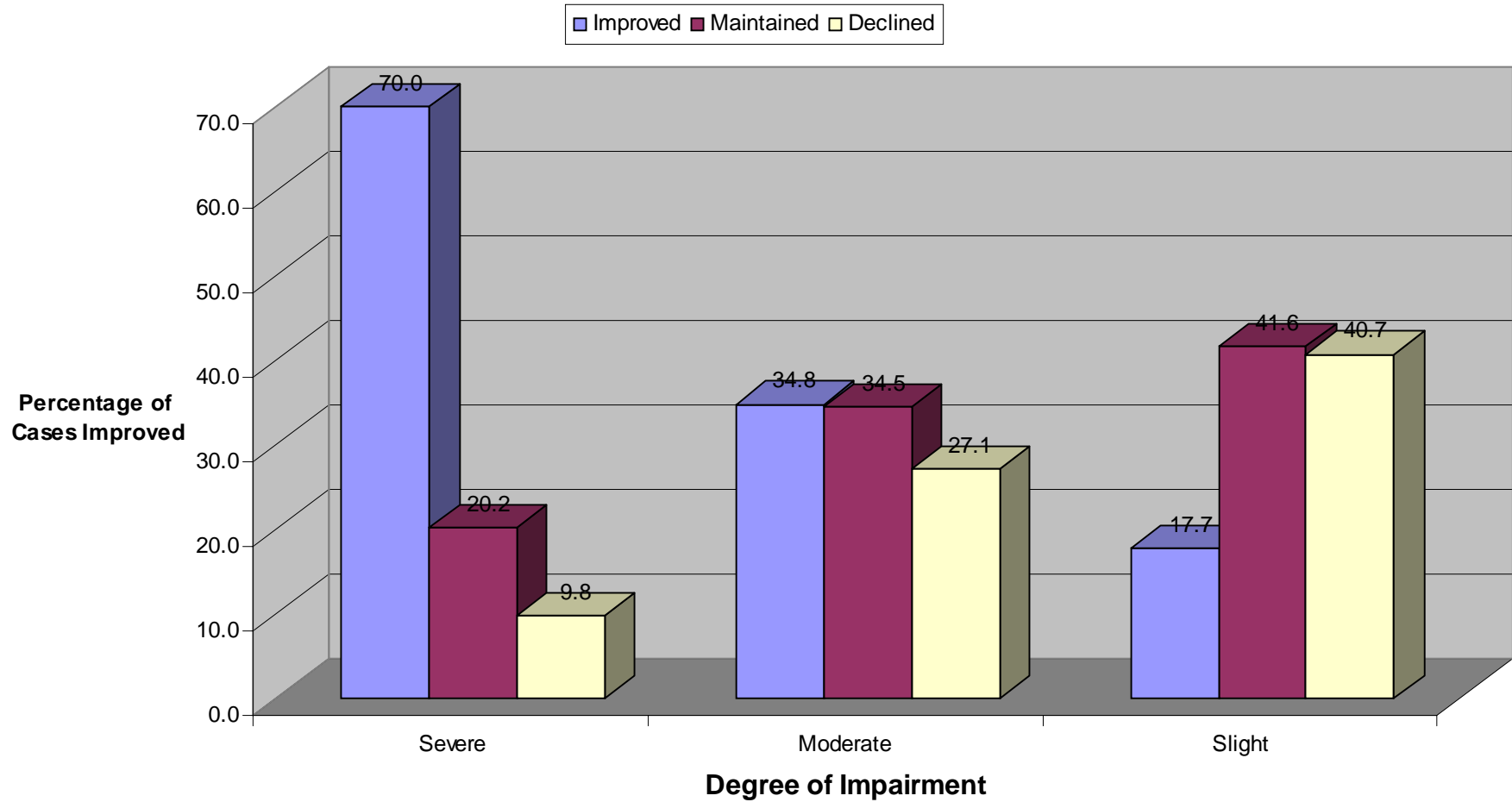
**Figure 3**

**Mental Health Treatment Outcomes  
State-wide: 1996-1998**



# Figure 4

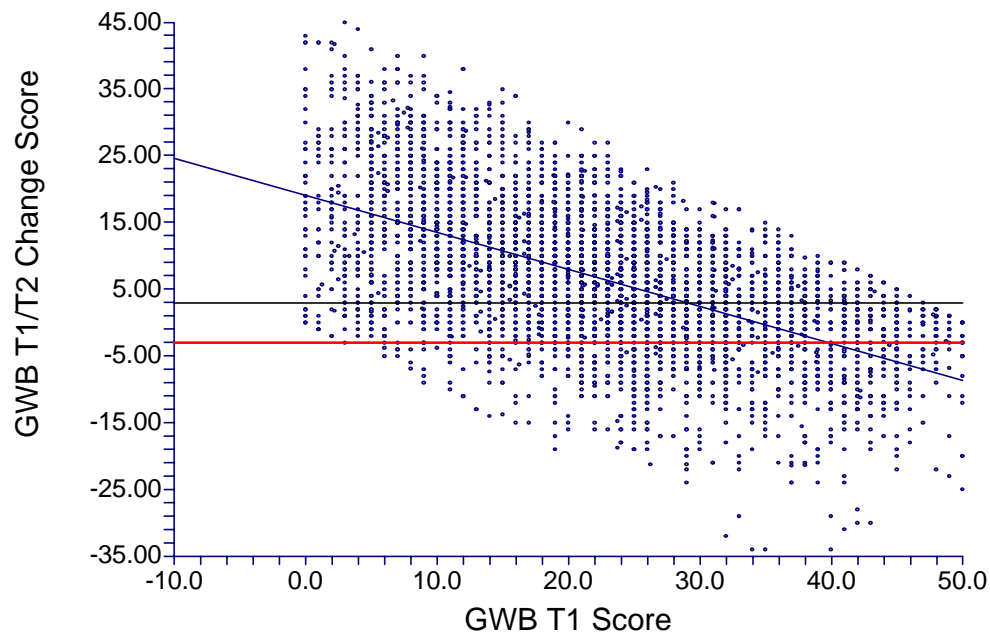
## State-wide Outcomes by Impairment Level 1996-1998



# Figure 5

Scatter Plot : GWB T1/T2 Change Scores -vs- GWB T1 Scores

*Regression and Improvement Category Boundaries*



**TABLE 29**

**Percentage of Cases with “Improved” Outcomes  
by Length of Measurement Interval (LOMI):**

**Risk-Adjusted vs Non-Risk-Adjusted for T1 Impairment**

Risk Adjustment Status for T1 GWB							
Row Index #	LOMI (in days)	N	Non-Adjusted		Risk-Adjusted (CVRA)		
			% Improved	Diff from Row # <sup>1</sup>	N	% Improved	Diff from Row # <sup>1</sup>
1	31-90	1430	59.6	--	1083	70.1	--
2	91-120	1410	58.8	--	1032	70.5	--
3	121-180	1128	58.2	--	842	68.9	--
4	181-365	323	62.8	--	250	72.0	--
Row Average <sup>2</sup>			59.9			70.4	
<b>State Sample</b>		<b>4,291</b>	<b>59.2</b>		<b>3,207</b>	<b>70.1</b>	

1 Index rows listed in column are significantly different from one another (p<.05, two-tailed z-test, in all cases).

2 Unweighted average of variable categories (rows).

**TABLE 31**

**Percentage of Cases with “Improved” Outcomes  
by Number of Outpatient Services :**

**Risk-Adjusted vs Non-Risk-Adjusted for T1 Impairment**

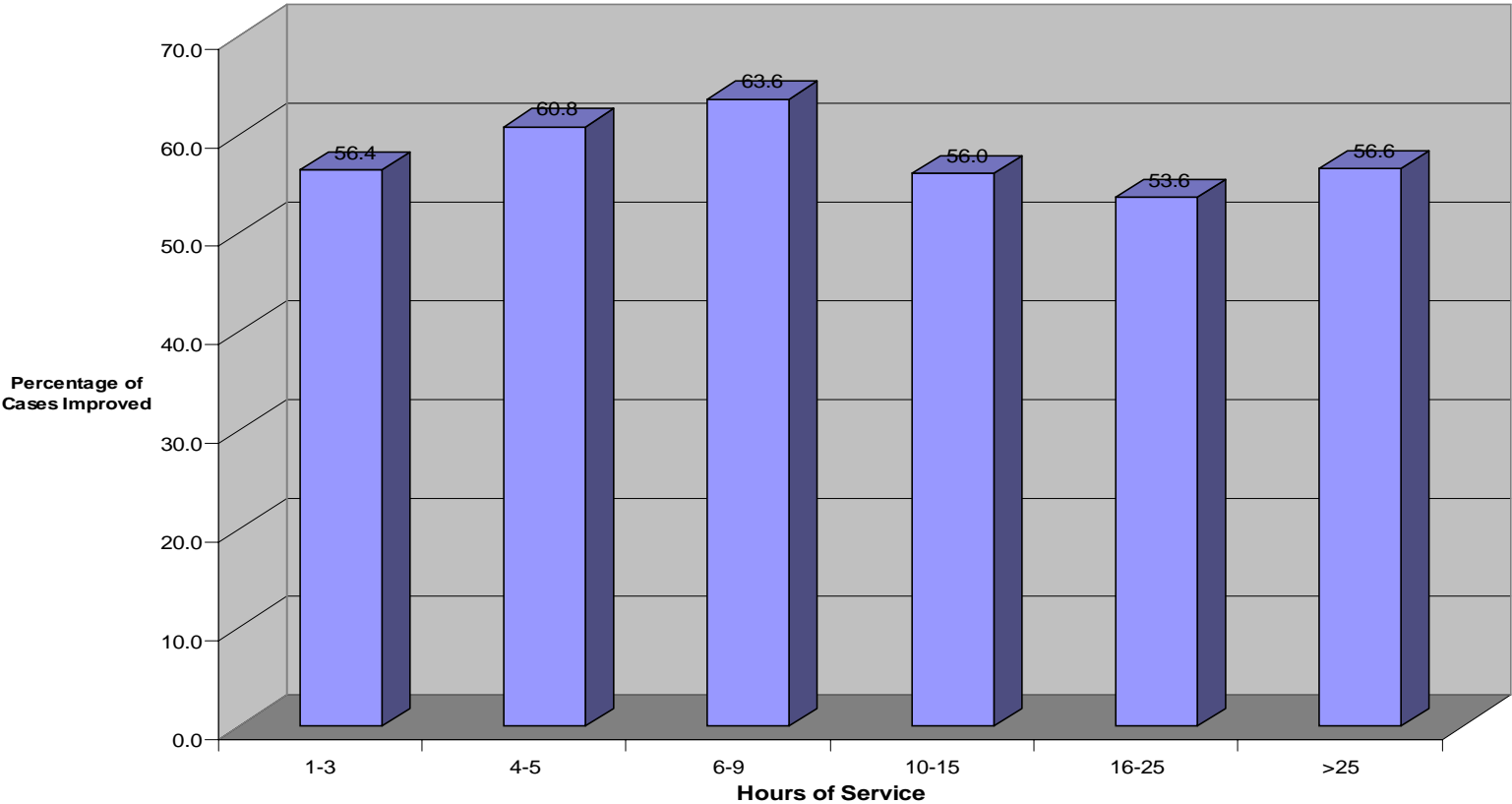
Row Index #	Service Counts	Risk Adjustment Status for T1 GWB					
		Non-Adjusted			Risk-Adjusted (CVRA)		
		N	% Improved	Diff from Row # <sup>1</sup>	N	% Improved	Diff from Row # <sup>1</sup>
1	1-3	732	56.4	3	511	66.7	3,6
2	4-5	571	60.8	5	457	69.1	6
3	6-9	931	63.6	1,4,5	742	74.1	1,4
4	10-15	643	56.0	3	471	67.7	3,6
5	16-25	295	53.6	2,3	178	69.7	
6	>25	143	56.6		84	81.0	1,2,4
Row Average <sup>2</sup>			57.8			71.4	
<b>State Sample</b>		<b>3,315</b>	<b>58.9</b>		<b>2,443</b>	<b>70.3</b>	

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<sup>1</sup> Index rows listed in column are significantly different from one another (p<.05, two-tailed z-test, in all cases).

<sup>2</sup> Unweighted average of variable categories (rows).

**Figure 8**  
**Improvement Rates by Hours of Outpatient Service**



**TABLE 32**  
**Average Number of Services Received**  
**by Outcome Group**

<b>Outcome Group</b>	<b>Number <sup>1</sup> in Group</b>	<b>Average Number of Services <sup>2</sup></b>	<b>Standard Deviation</b>
<i>Improved</i>	2,252	13.6	24.3
<i>Maintained</i>	954	13.0	23.1
<i>Declined</i>	616	14.3	26.1
<b>Total Sample</b>	<b>3,822</b>	<b>13.5</b>	<b>24.3</b>

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<sup>1</sup> The number of cases available for this analysis was reduced from 4,291 to 3,822 due to service counts not reported for one CMHC and reported for only a fraction of the cases for a second CMHC.

<sup>2</sup> The outcome groups did not differ from one another in the average number of services received between the T1 and T2 administrations of the GWB, [ $F_{(2, 3,821)} = .61, p = .54$ ].

**Impact of T1 Constant Value Risk Adjustment (CVRA) on Comparative improvement Rates**

Row ID	CMHC	Risk Adjustment for T1 Impairment Level					
		No Risk Adjustment % Cases Improved	CMHC Rank	Rows Significantly Different (.05)	CRVS Adjustment % Cases Improved	CMHC Rank	Rows Significantly Different (.05)
A	BR	64.3	1	g,h	74.4	2	f,h
B	SWST	62.2	2		80.5	1	f,h
C	FCRNS	61.3	3		70.2	5	h
D	VMH	60.0	4	h	72.1	3	h
E	CEN	59.6	5		68.7	6	
F	WBR	58.2	6		64.5	7	a,b
G	DBH	56.2	7	a	71.1	4	
H	WAS	55.3	8	a,d	63.3	8	a,b,c,d
	Total Sample	59.2			70.1		

**Impact of T1 Standard Reference Population Risk Adjustment (SRP) on Comparative Improvement Rates**

Row ID	CMHC	Risk Adjustment for T1 Impairment Level					
		No Risk Adjustment % Cases Improved	CMHC Rank	Rows Significantly (.05) Different	SRP Adjustment % Cases Improved	CMHC Rank	Rows Significantly (.05) Different
A	BR	64.3	1	g,h	61.2	4	
B	SWST	62.2	2		66.4	1	f
C	FCRNS	61.3	3		61.9	3	
D	VMH	60.0	4	h	63.3	2	
E	CEN	59.6	5		57.5	7	
F	WBR	58.2	6		54.6	8	
G	DBH	56.2	7	a	58.5	6	
H	WAS	55.3	8	a,d	60.7	5	
	Total Sample	59.2			60.5		

Standard Reference Population: Statewide (total sample) impairment levels — 75.0 percent severely impaired, 12.0 moderately impaired and 13.0 percent mildly impaired

Those who may be interested in further information concerning the project reported herein should contact:

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