

COMPARISONS OF MORTALITY,
CAUSES OF DEATH
AND DIAGNOSES FOR PUBLIC
MENTAL HEALTH CLIENTS IN NINE
STATES

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- Ellen Sparks, South Carolina
- Kitty Hepfer, South Carolina
- Eva Jakuba, Connecticut
- Bruce Dembling

Mortality Data from 9 States

- Arizona - 1999-2000, Matched
- D.C. - 1998-2000, Multiple Sources
- Missouri - 1997-2000, Matched
- Oklahoma - 1997-99, Matched
- Rhode Island - 2000, Matched
- Texas - 1997-1999, Matched
- Utah - 1998-1999, Matched
- Vermont - 1998-2000, Used Probabilistic Population Estimates
- Virginia - 1998-2001, Reported deaths in state hospitals/mh treatment

Mortality Data from the States

- Matching client records and death records often requires working with an agency other than the state mental health authority.
- Data submission range - 1997 - 2001
- All states did not submit data for every year.
- Additional data were needed to calculate mortality measures: number unduplicated clients by gender & age; age specific death rates by gender and age for state residents.
- State CMRs, Age Adjusted Rates, life expectancy - sources: CDC or states

MORTALITY:

**Indicator of the health status of
clients served by public mental
health organizations**

Rationale for use:

- Mortality rates are commonly used as global measures of health status for populations.
- They are increasingly being used as indicators of public health efforts.
- Persons with mental illness die at higher rates and at younger ages from nearly all causes, both natural and medico legal, i.e. homicide, suicide, or accidents/injuries.
- Research and practice provide compelling evidence for tracking mortality as a measure of health status.

Research Examples Relating Mental Illness and Mortality

- Nationally, over 90 percent of youth suicide completers had a psychiatric diagnosis. Most had been struggling for years. Few (5 to 20 percent) had been in treatment at the time of death.
- Depression linked to heart disease and stroke.
- Schizophrenia linked to increased risk of diabetes. Some medications increase risk.
- In Sweden, mortality among schizophrenic patients reflected changes in care.

MENTAL HEALTH AND PHYSICAL HEALTH ARE LINKED.

- Physical and mental are joined together in a complex adaptive system within each human being.
- The physical and the mental interact within this system.
- Physical health and mental health are interrelated.
- Mortality can be measured and quantified for these complex adaptive systems.

Mortality Measures

- Crude Mortality Rate (CMR)
- Age Adjusted Mortality Rate
- Standardized Mortality Ratio (SMR)
- Average Number of Years of Life Lost (YLL)
and Average age at time of death

Crude Mortality Rate (CMR)

- Numerator: Number of deaths among persons who received at least one service during a certain year.
- Denominator: The total number of persons who received at least one service during that year.
- For this study, CMRs show rates per 100,000 for MH clients and for the state general population.
- Vermont used probabilistic population estimation.

Figure 1. Year 1997 Crude Mortality Rates (CMR) for Mental Health Clients and Statewide

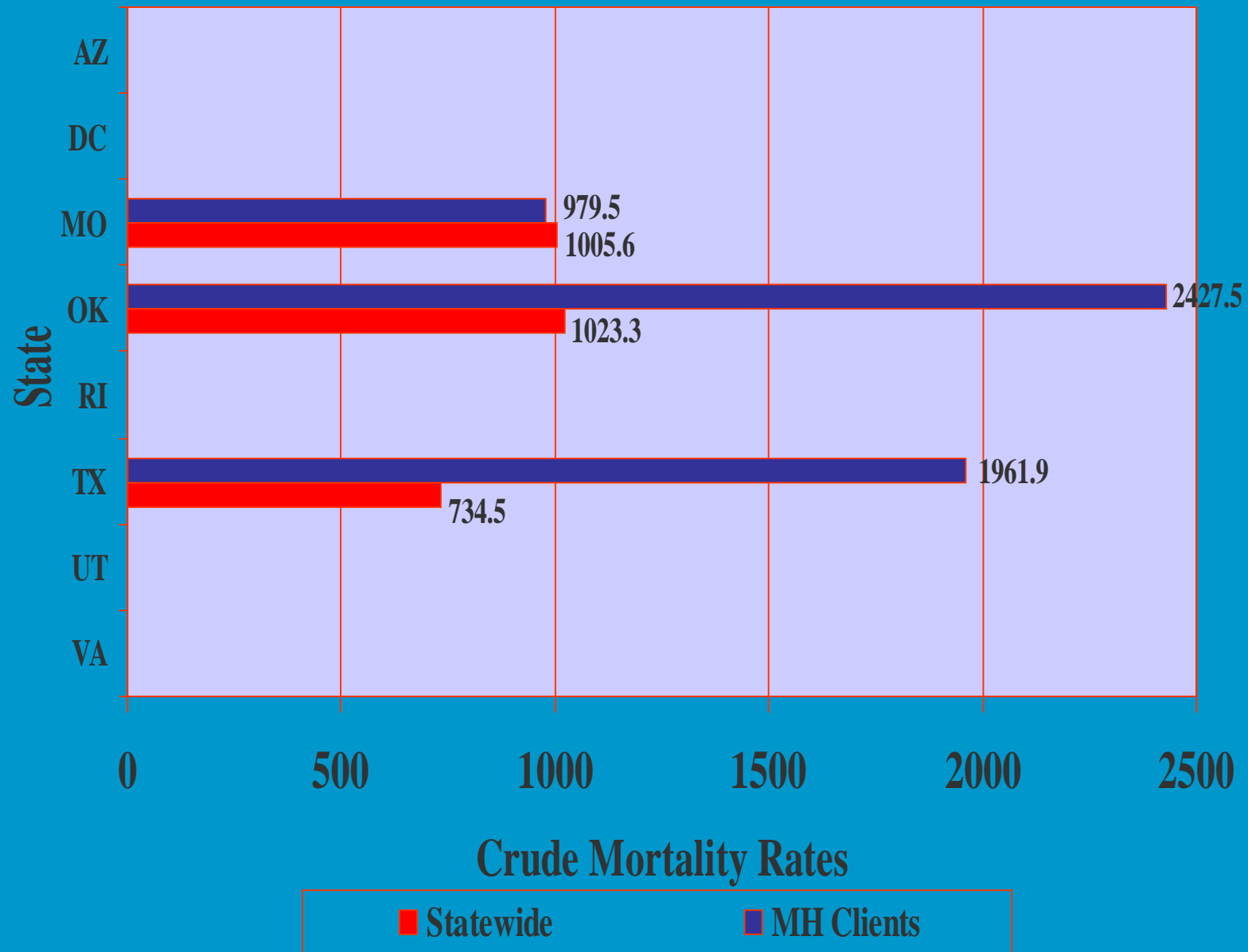


Figure 2. Year 1998 Crude Mortality Rates (CMR) for Mental Health Clients and Statewide

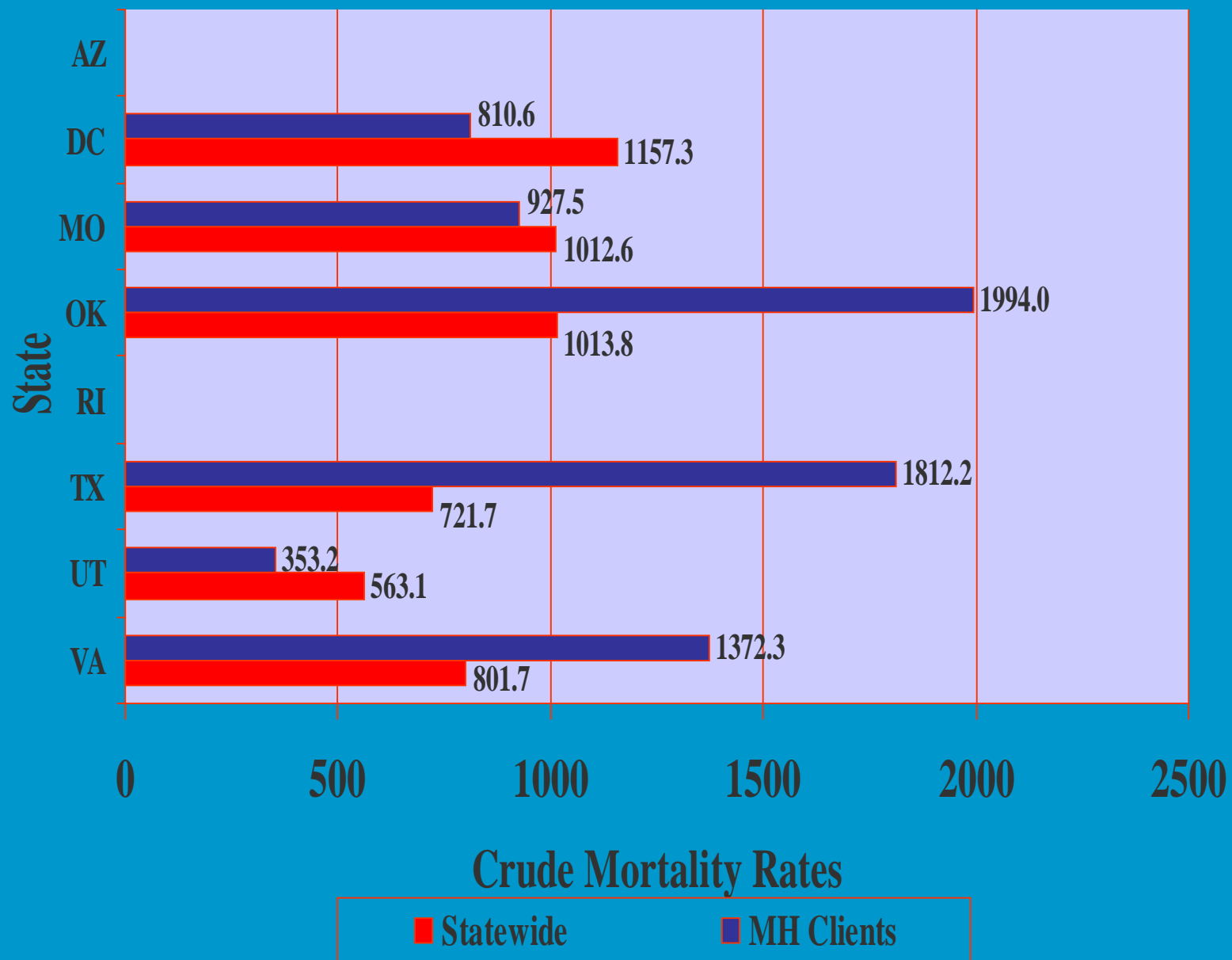


Figure 3. Year 1999 Crude Mortality Rates (CMR) for Mental Health Clients and Statewide

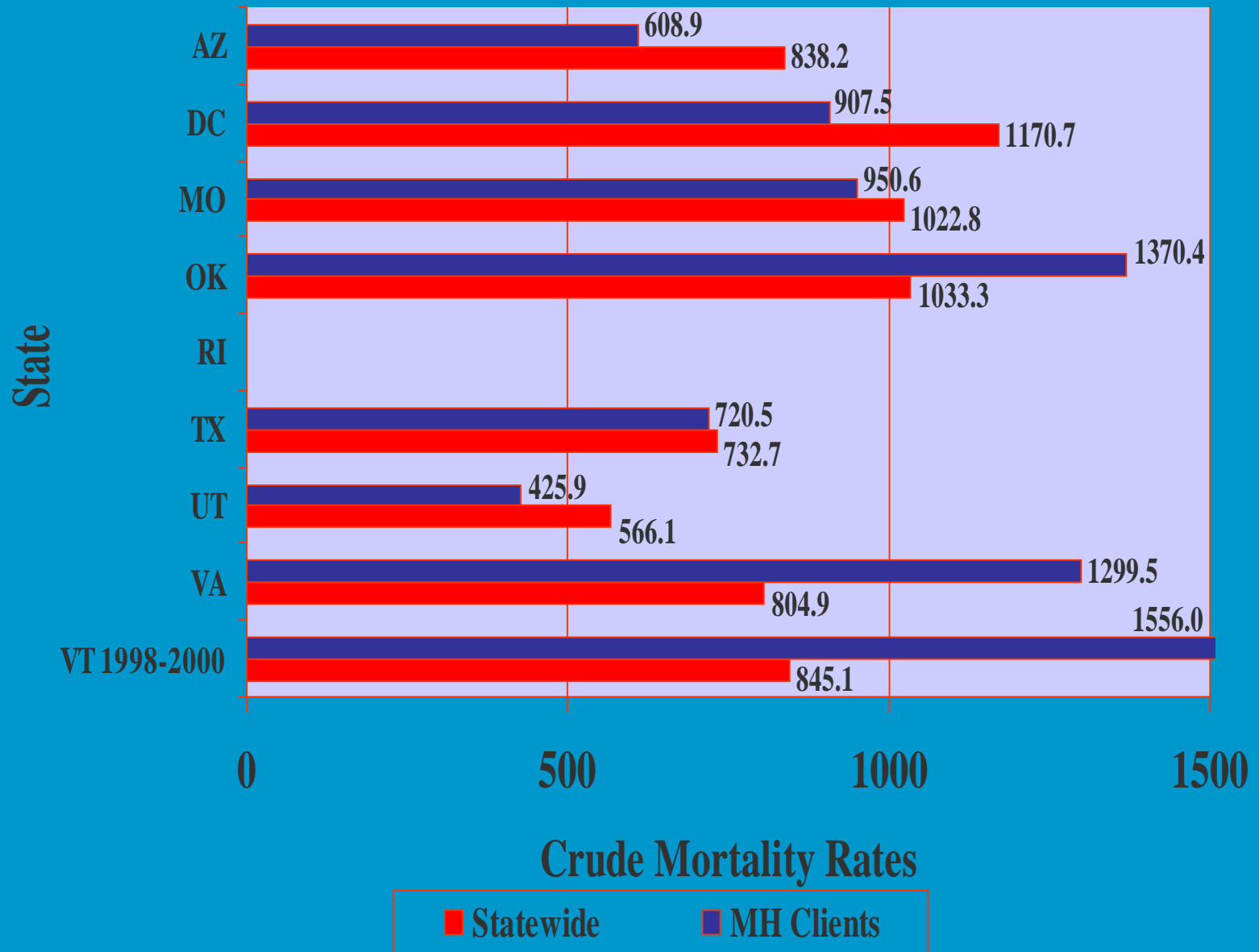
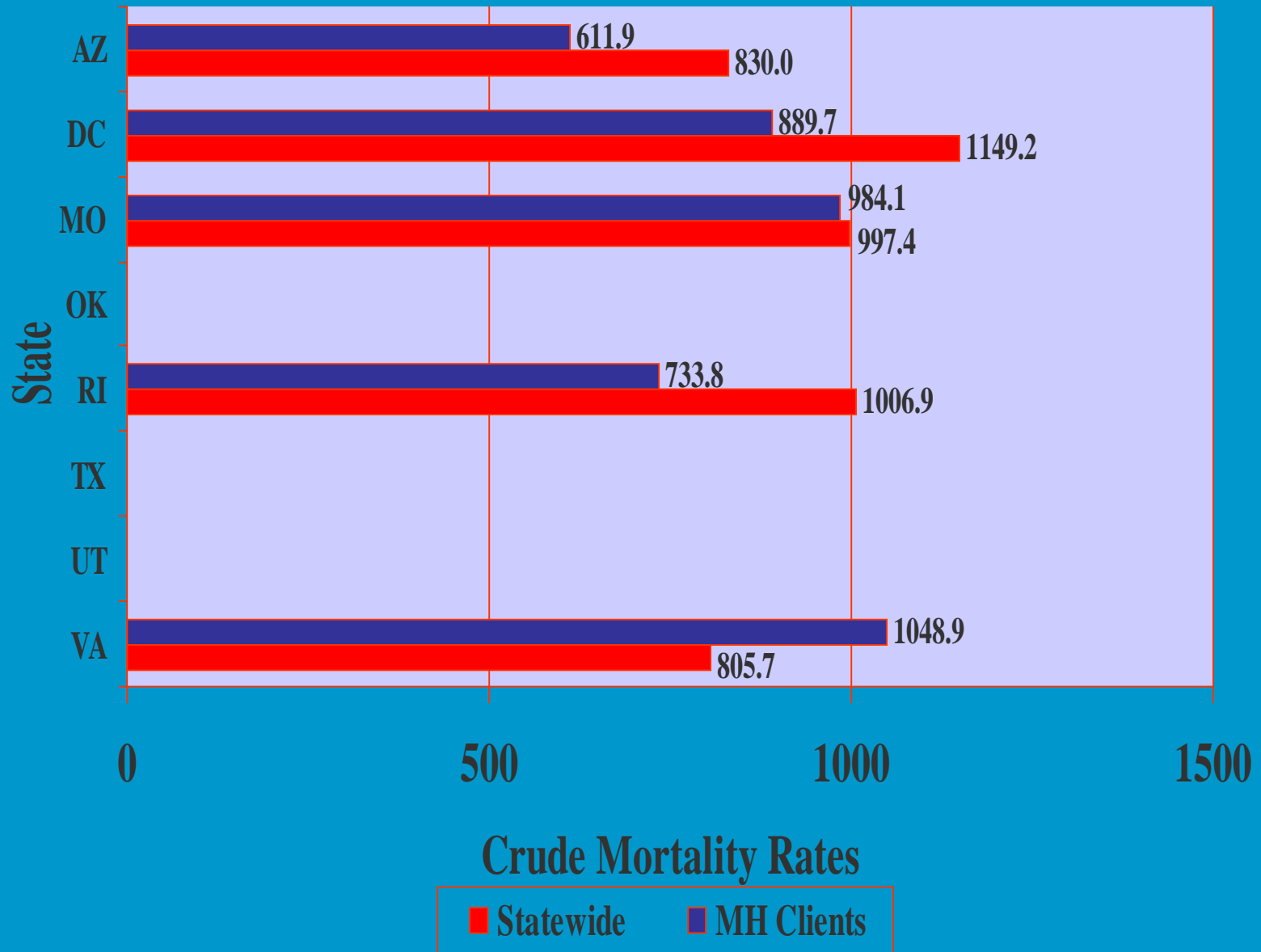


Figure 4. Year 2000 Crude Mortality Rates (CMR) for Mental Health Clients and Statewide



Crude Mortality Rates (CMRs) Results

- In 13 out of 22 comparisons, statewide CMRs were higher than MH client CMRs.
- CAUTION: CMRs are not standardized or adjusted to account for age or gender differences in the population.
- Results are different when age adjustments using a standard population are applied.

Age Adjusted Mortality Rate

- Age adjustment or standardization is used to compare different populations. Age is a main determinant of mortality.
- Age specific death rates from two populations with different age structures are applied to a third “standard” population, i.e. MH clients vs. state populations.
- Direct method of standardization

Age Adjusted Mortality Rate

- U.S. 2000 Standard population for 1998 and later
- U.S. 1940 Standard population for 1997
- For this study, Age Adjusted Mortality Rates show rates per 100,000 for MH clients and for the state general population.
- Vermont used probabilistic population estimation.

Figure 5. Year 1997 Age Adjusted Mortality Rates for Mental Health Clients and Statewide

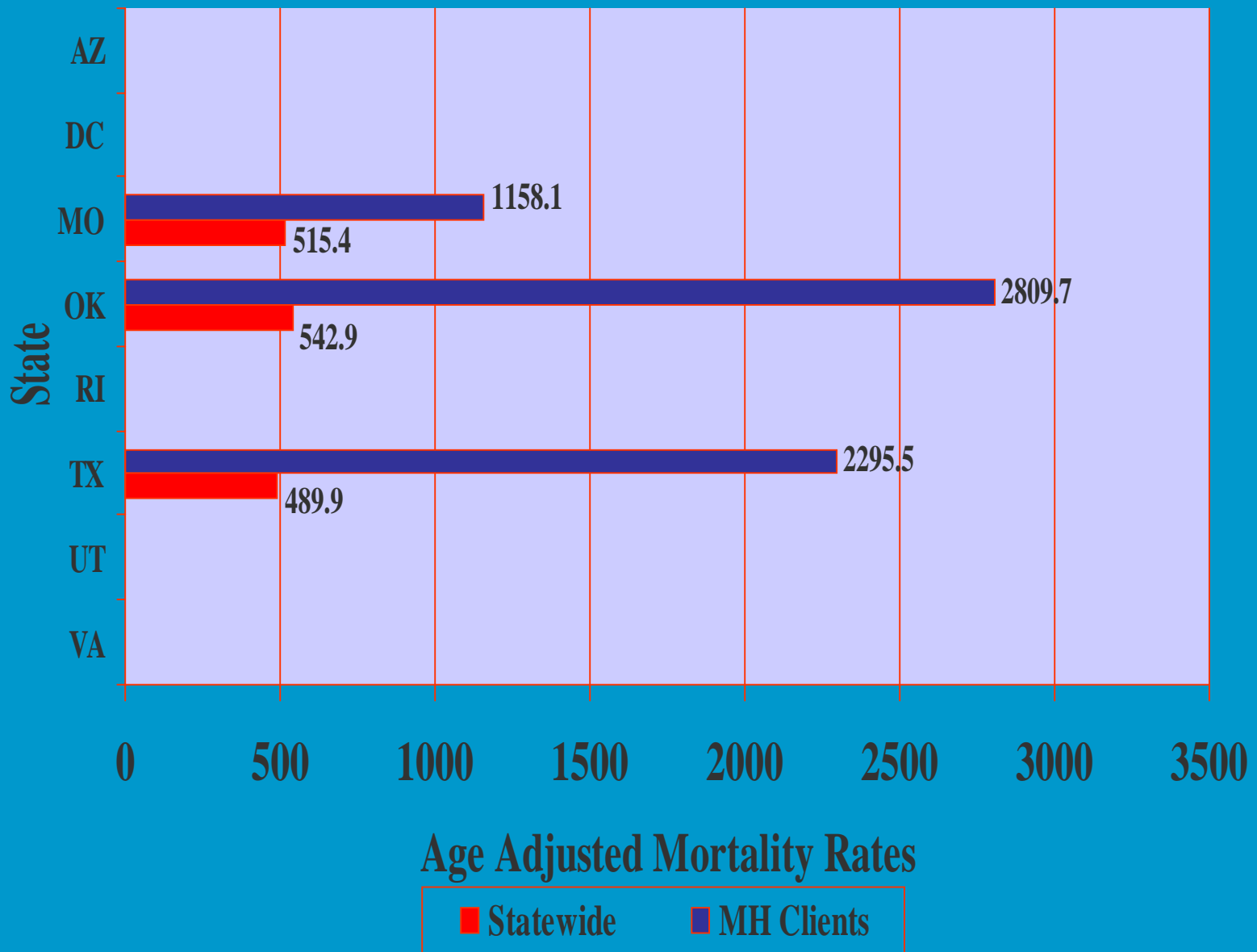


Figure 6. Year 1998 Age Adjusted Mortality Rates for Mental Health Clients and Statewide



Figure 7. Year 1999 Age Adjusted Mortality Rates for Mental Health Clients and Statewide

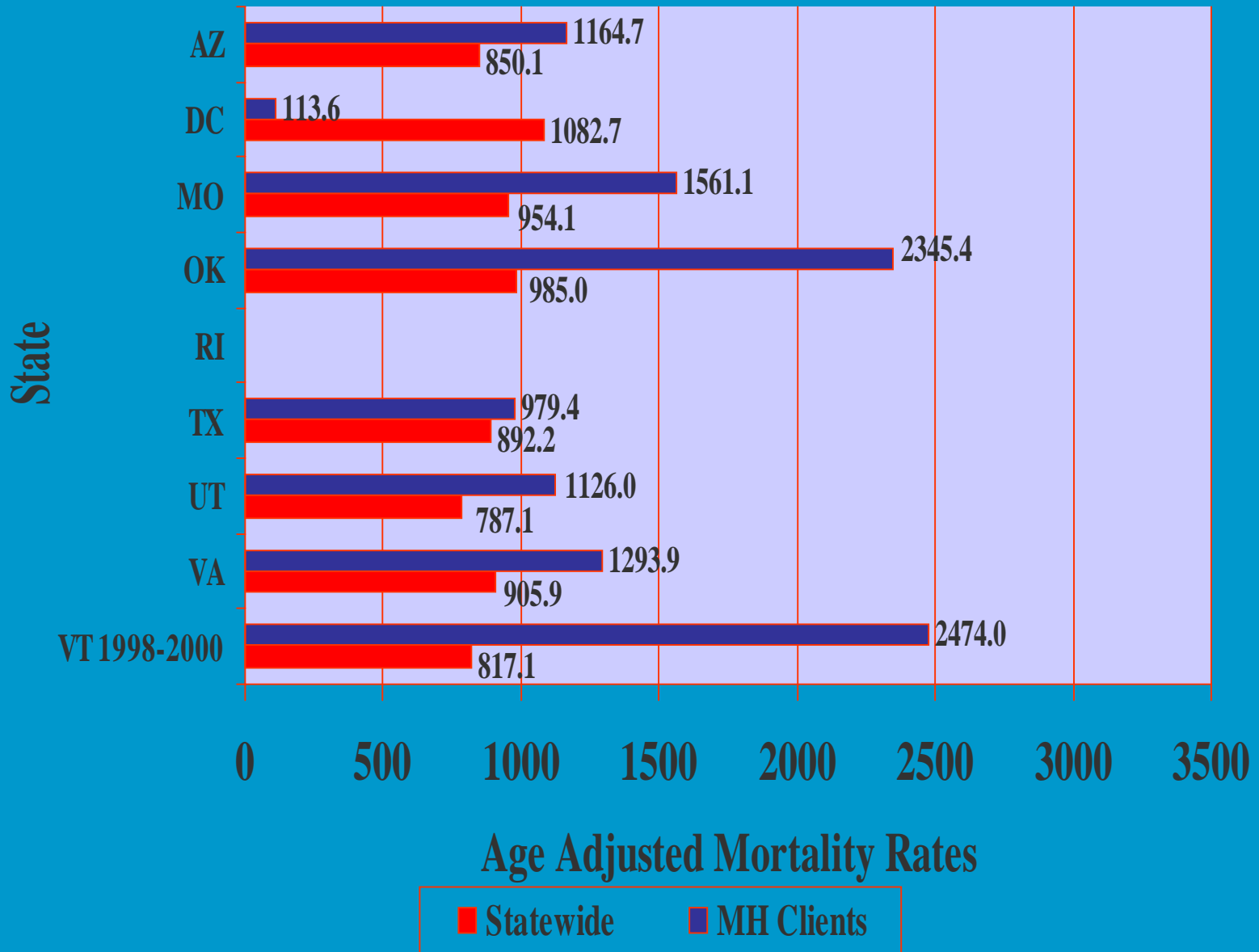
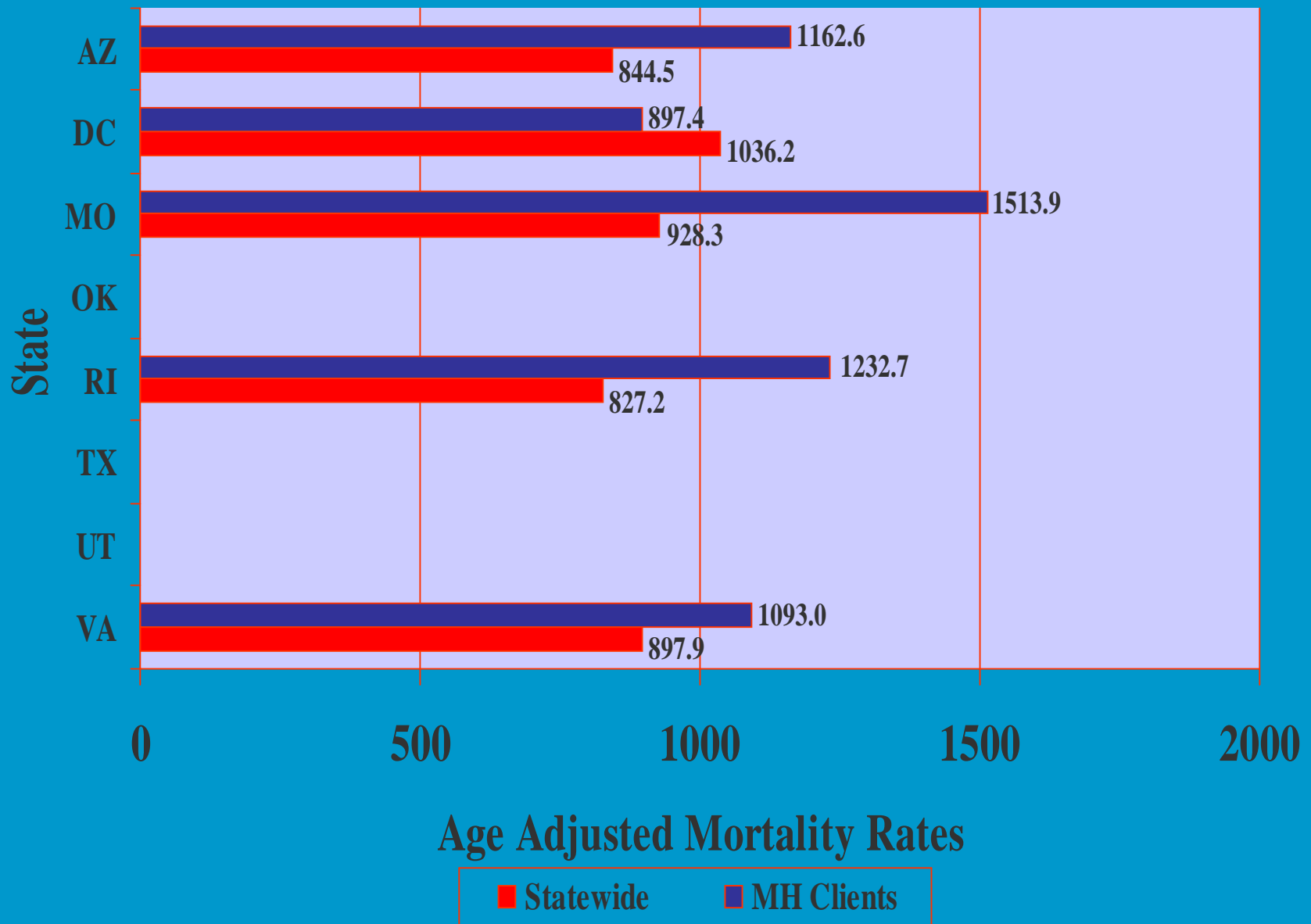


Figure 8. Year 2000 Age Adjusted Mortality Rates for Mental Health Clients and Statewide



Age Adjusted Mortality Rates

- In 20 out of 22 comparisons, public mental health clients have higher age adjusted mortality rates than the general population of the state.
- All eight states have higher age adjusted rates for mental health clients during every year submitted.
- Only in Washington, D.C. did MH clients have lower rates than the general population. This occurred during 2 out of 3 years.

Standardized Mortality Ratio - SMR

(Ratio: actual deaths/expected deaths)

- Numerator: Actual number of deaths among persons who received at least one mental health service during the year.
- Denominator: Number of deaths expected in the population of persons who received at least one service during the year, based on age and sex specific mortality rates of the overall population in a state.
- Indirect standardization method - Uses both age and sex.

Figure 10. Numbers of Expected and Actual Deaths Among Year 1997 Clients of State Public Mental Health Systems

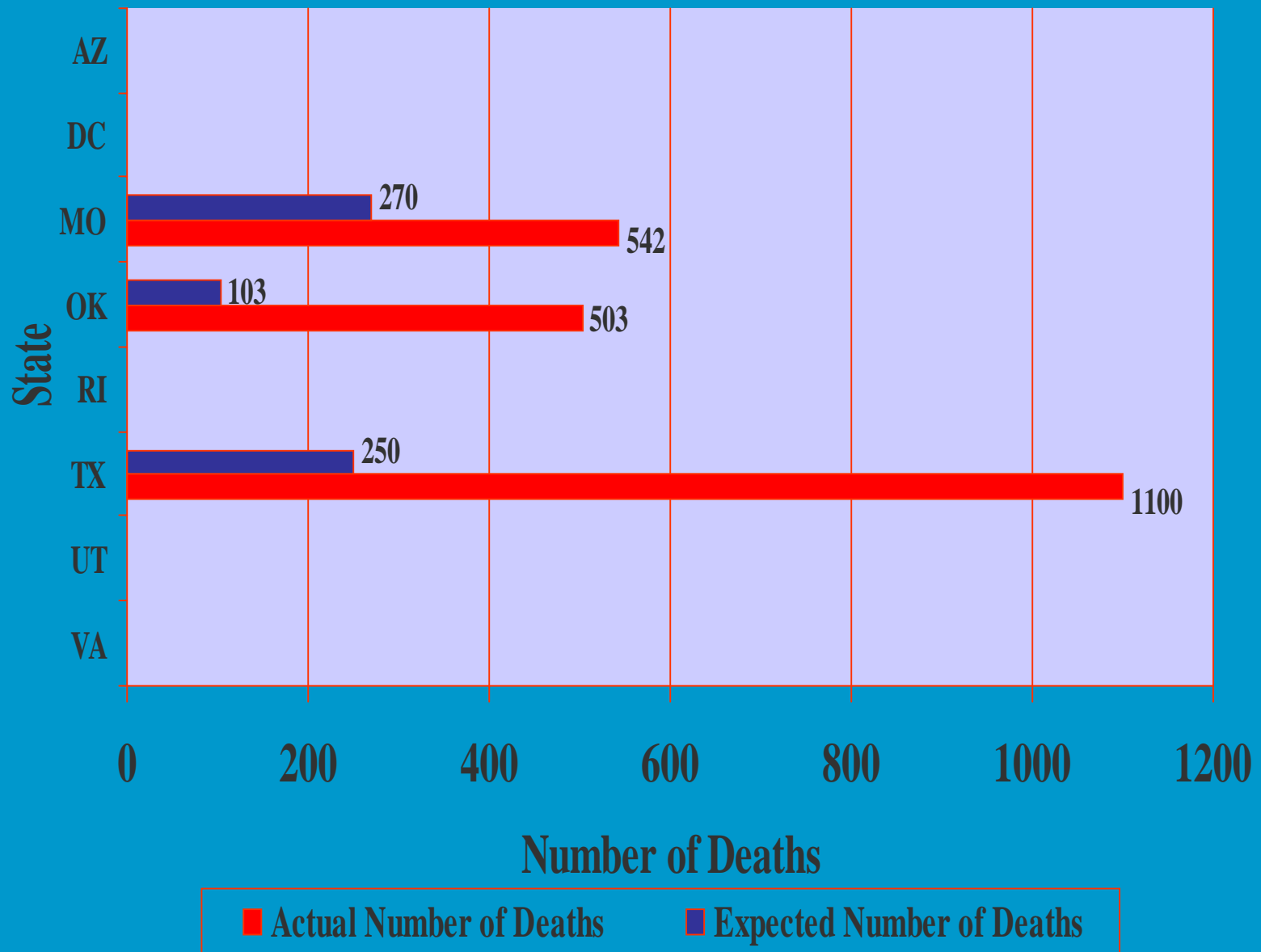


Figure 11. Numbers of Expected and Actual Deaths Among Year 1998 Clients of State Public Mental Health Systems

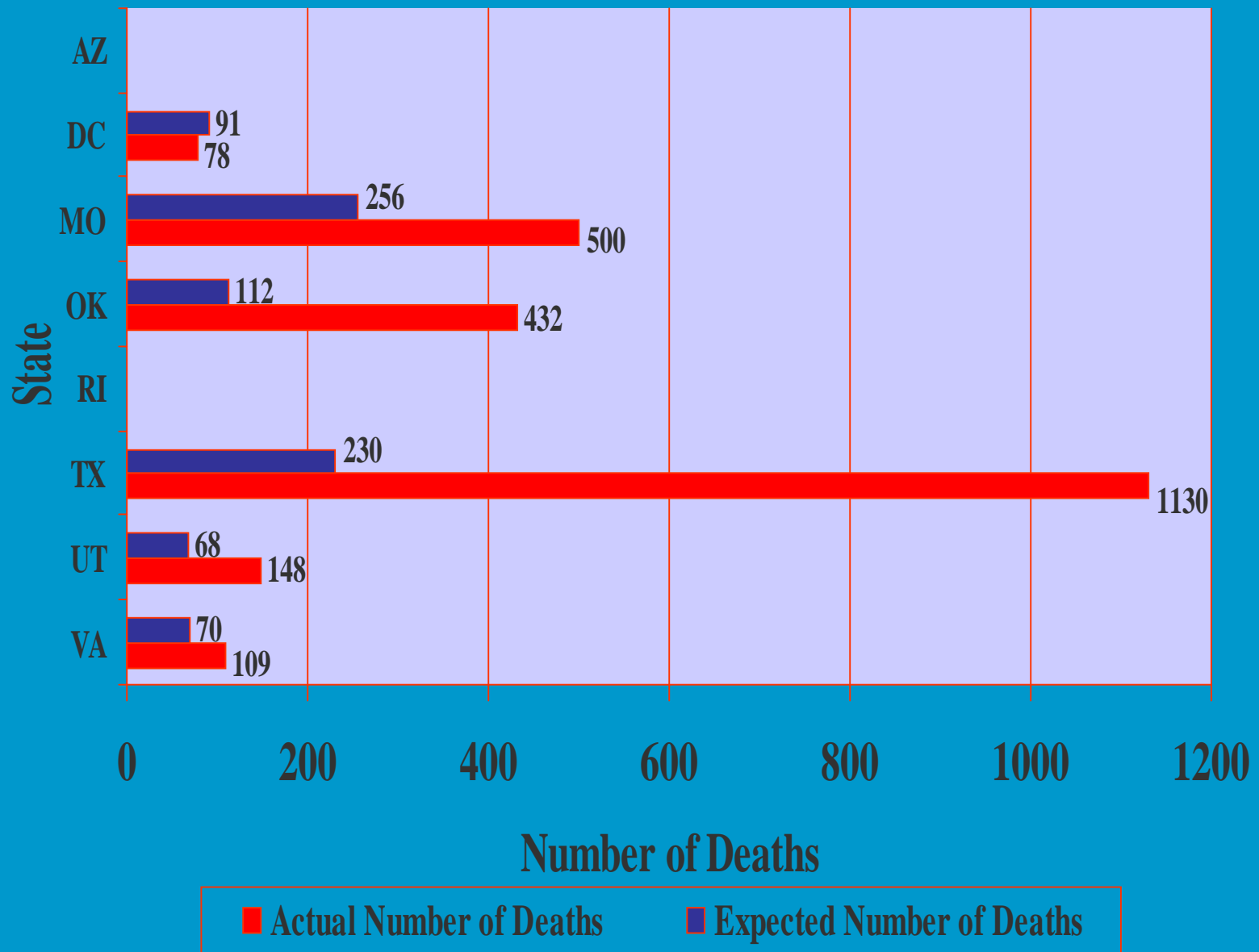


Figure 12. Numbers of Expected and Actual Deaths Among Year 1999 Clients of State Public Mental Health Systems

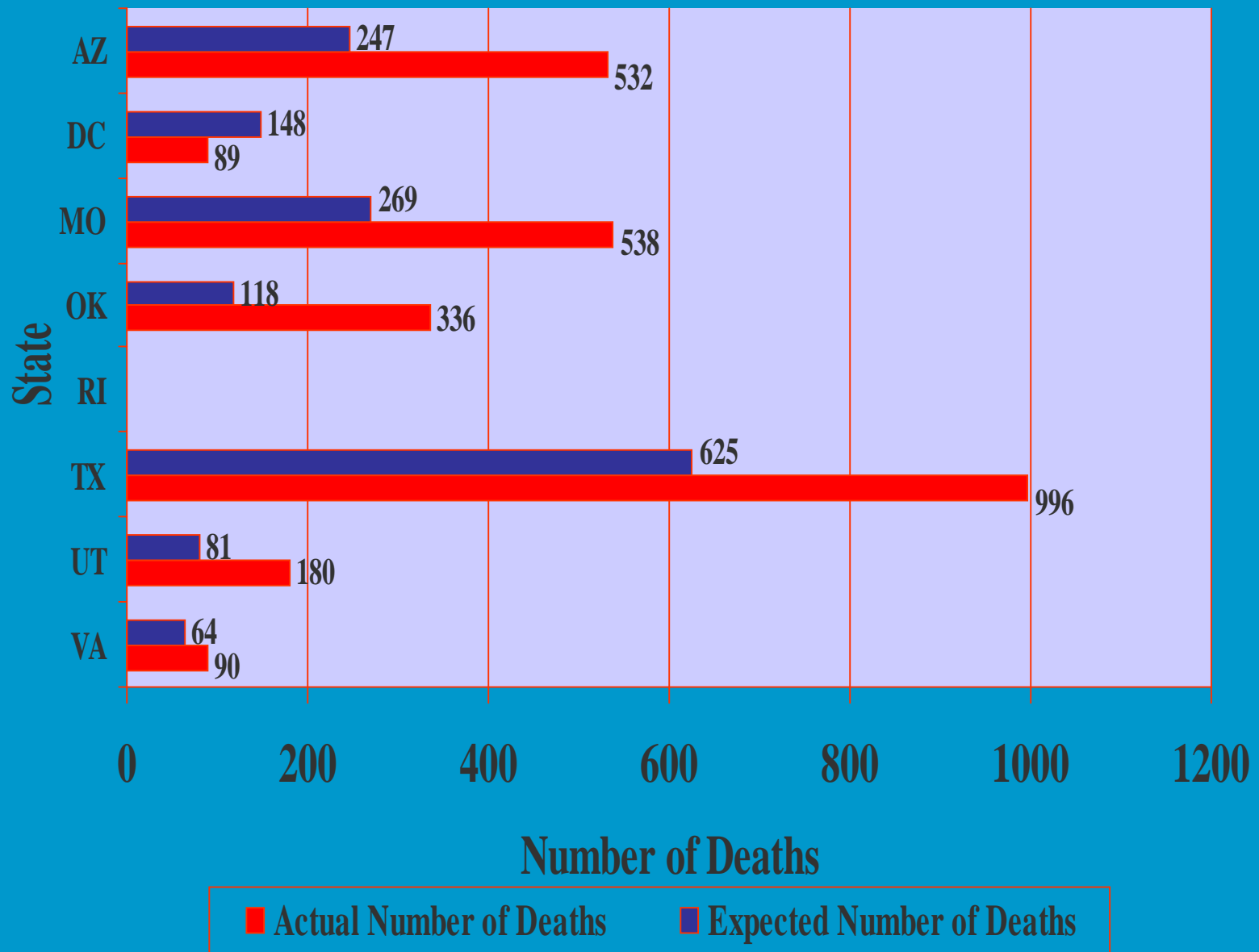


Figure 13. Numbers of Expected and Actual Deaths Among Year 2000 Clients of State Public Mental Health Systems

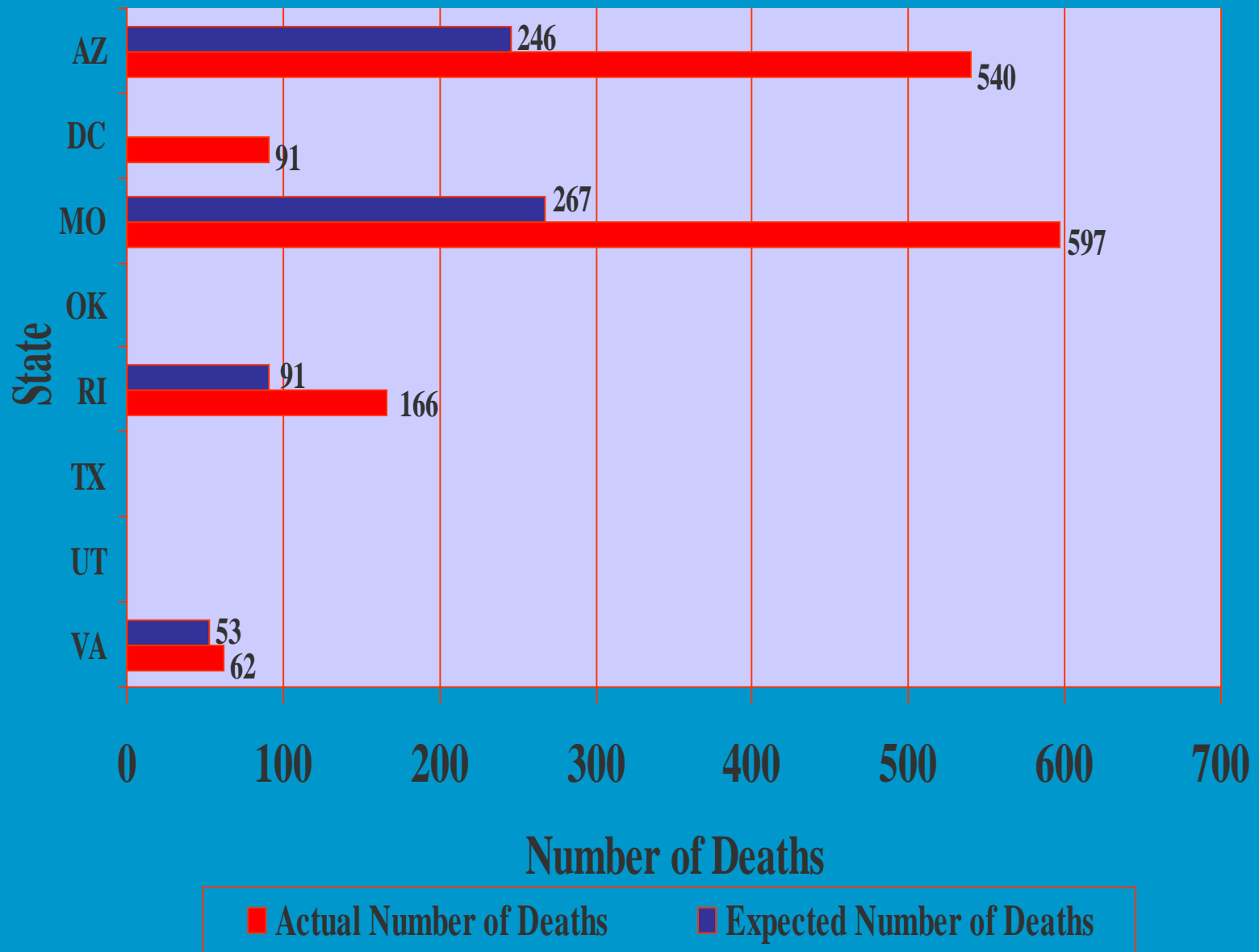
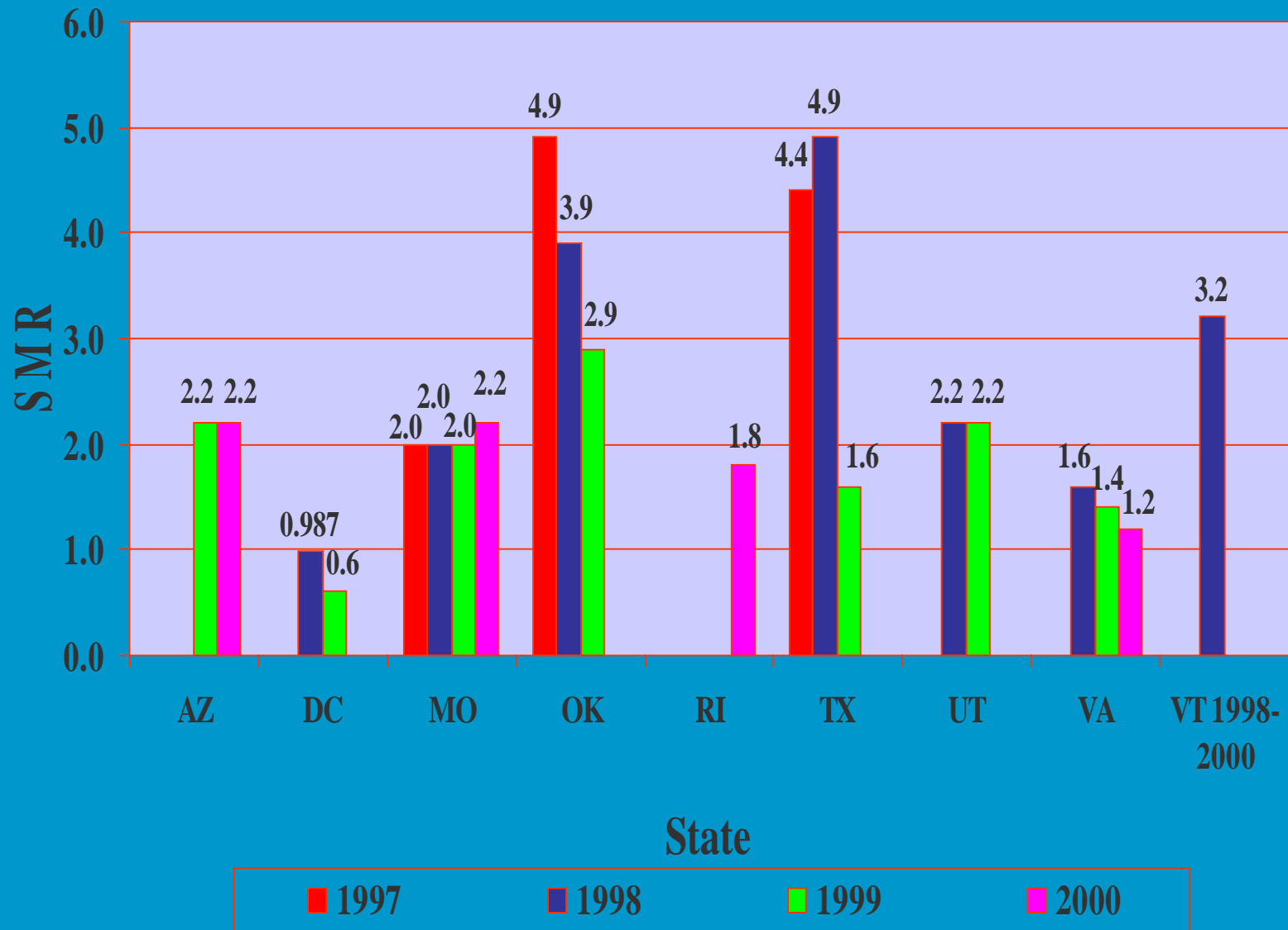


Figure 9. Standardized Mortality Ratios (SMR) Comparing the Number of Deaths of State Public Mental Health Clients to the Expected Number of Deaths for that Client Population (Based on State Age Specific Death Rates During the Year)



Standardized Mortality Ratio - SMR (Ratio: actual deaths/expected deaths)

- In eight states across all years, the SMRs were greater than 1.0.
- When an SMR is greater than 1.0, the relative risk of death for mental health clients is higher than for the general population of the state.
- Only in D.C. were actual number of deaths lower than the calculated expected number.

Average Number of Years of Life Lost (YLL)

- Numerator: The sum of the difference between the age of death and the current life expectancy for a person of that age who received at least one service during a certain year. (Used U.S. life expectancy tables published by CDC.)
- Denominator: The number of persons who received at least one service in that year who died and whose age of death was available.
- Average age at time of death

Figure 15. Average Age at Time of Death for Public Mental Health Clients

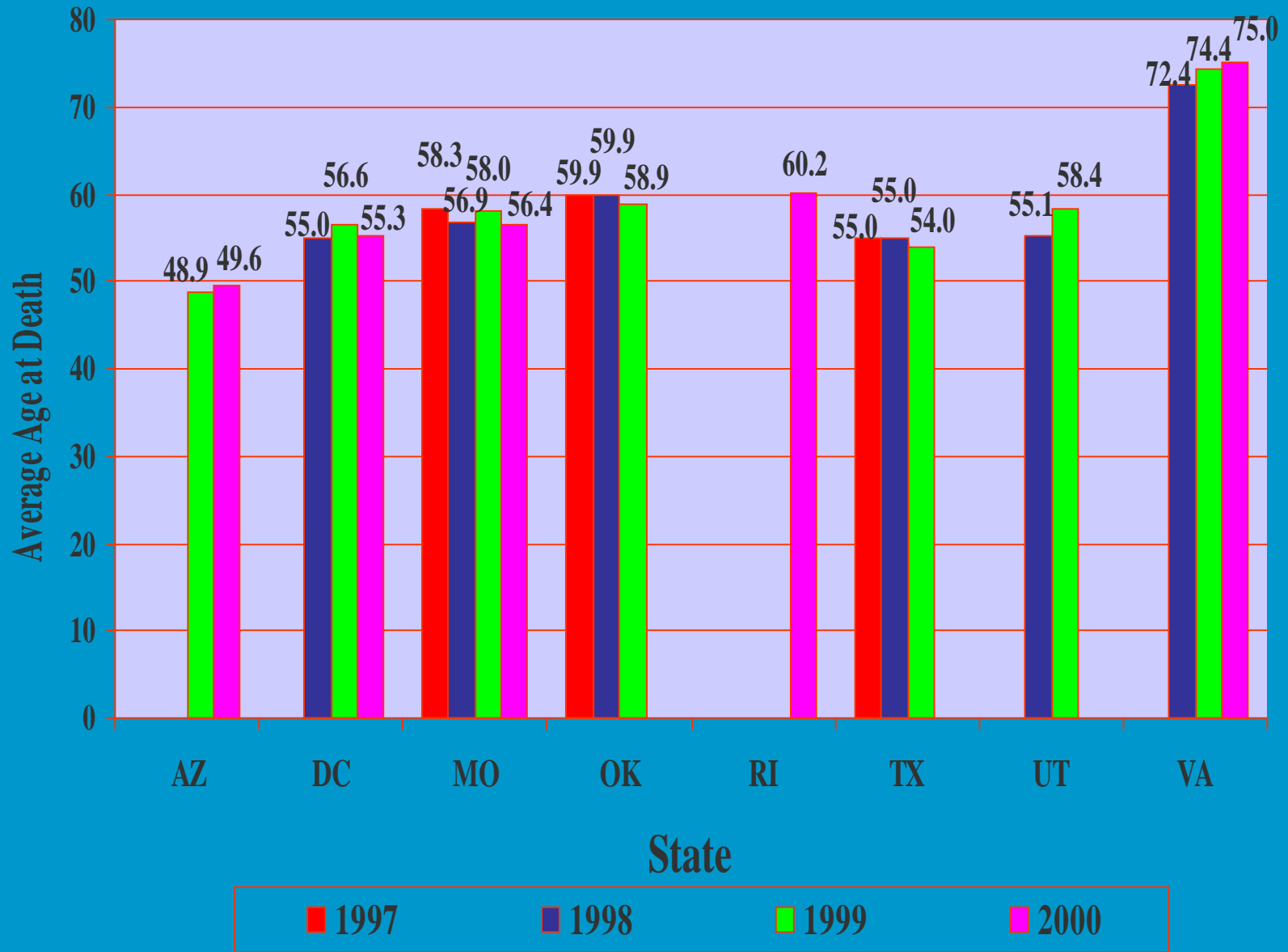


Figure 16. Average Age at Time of Death for Male and Female Public Mental Health Clients

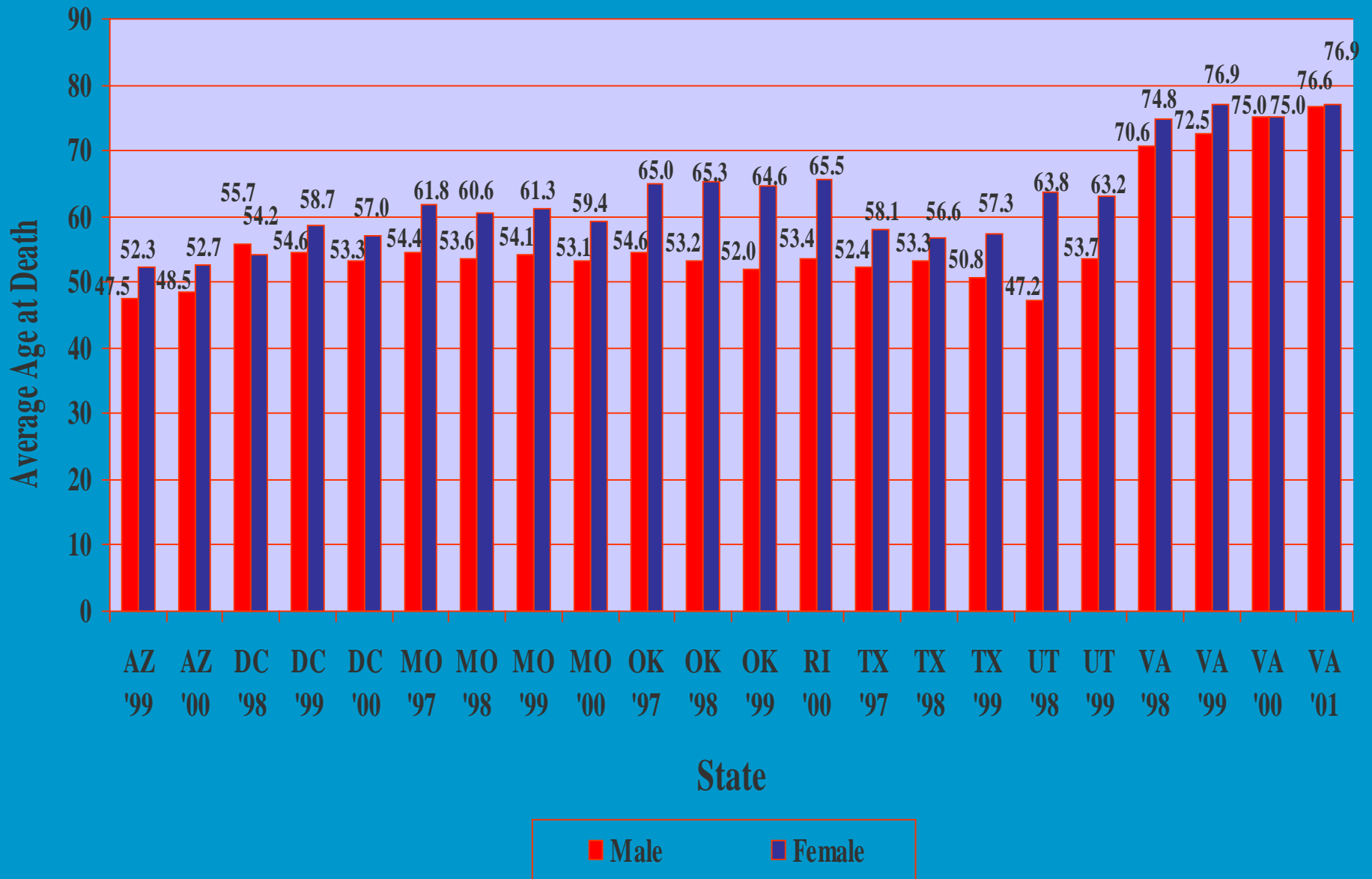
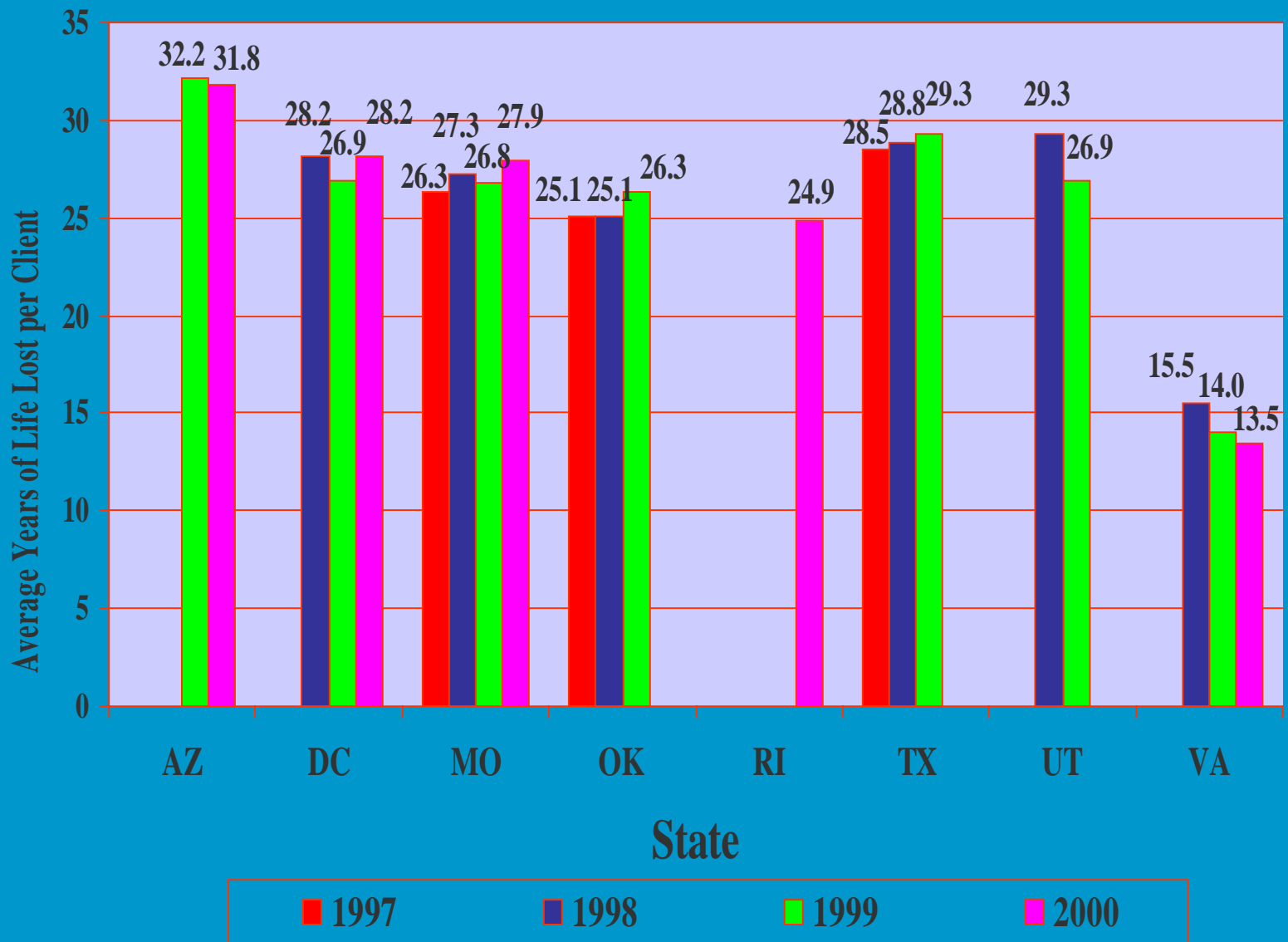


Figure 14. Average Number of Years of Life Lost (YLL) per Public Mental Health Client Who Died During a Year in Which a Service Was Received



Average Number of Years of Life Lost (YLL) and Average Death Age

- Average death age for all MH clients ranged from 49 to 60, except in Virginia.
- Nationwide, the average death age is in the seventies.
- On the average, male MH clients almost always die at a younger age than female MH clients.
- 25 to 32 years of life were lost per client in every state, except Virginia (13 to 15 YLL per patient).

Diagnoses of Deceased Public Mental Health Clients

**Table 10. Diagnoses of Deceased Clients
Who Were Served During the Year in Which They Died**

	AZ 1999	AZ 2000	DC 1998	DC 1999	DC 2000	MO 1997	MO 1998	MO 1999	MO 2000	OK 1997	OK 1998	OK 1999
DIAGNOSIS												
Attention Deficit	3	4	0	0	0	1	1	1	0	2	1	2
Conduct Disorder	2	1	1	0	1	5	2	3	0	3	1	1
Mental Retardation, Autism, Specific Development	1	1	0	0	0	0	0	1	0	1	0	2
Other Childhood Disorders	0	0	0	0	0	0	0	0	0	0	0	1
Schizophrenia	44	79	41	46	36	188	162	177	151	83	101	61
Other Psychotic Disorders	21	20	4	7	9	12	14	15	15	26	12	15
Bipolar Disorder	41	63	8	12	13	57	57	54	63	21	19	14
Major Depression	76	49	5	6	4	68	77	96	101	82	60	58
Other Mood Disorders	28	34	5	4	1	14	18	24	19	85	84	71
Dementia, Delirium, Other Related	15	14	4	2	5	72	60	70	51	50	22	22
Substance Abuse	81	110	4	3	2	32	38	32	34	33	36	18
Anxiety	11	21	0	0	0	12	14	10	12	28	18	11
Personality Disorder	1	2	1	1	0	0	1	1	0	4	4	2
Other MH Diagnoses	10	7	4	9	18	81	54	54	149	72	72	59
No Diagnosis, Deferred	3	5	1	1	2	0	2	0	2	13	2	6
Total	532	540	78	91	91	542	500	538	597	503	432	336
Depressive & Other Mood Disorders	145	146	20	25	19	153	155	177	183	215	185	166

Table 10. (continued) Diagnoses and Major Mental Ill of Deceased Clients Who Were Served During the Year in Which They Died

	RI 2000	UT 1998	UT 1999	VA 1998	VA 1999	VA 2000	VA 2001
DIAGNOSIS							
Attention Deficit	0	2	3	0	0	0	0
Conduct Disorder	1	0	1	0	0	0	0
Mental Retardation, Autism, Specific Development	1	0	0	0	0	0	0
Other Childhood Disorders	0	0	0	0	0	0	0
Schizophrenia	43	17	17	18	15	10	9
Other Psychotic Disorders	5	3	4	2	2	0	1
Bipolar Disorder	21	12	12	6	3	5	4
Major Depression	26	38	41	8	6	0	0
Other Mood Disorders	6	11	17	2	0	0	2
Dementia, Delirium, Other Related	10	19	27	63	59	40	42
Substance Abuse	14	15	16	6	4	5	1
Anxiety	10	5	9	0	0	0	0
Personality Disorder	2	0	2	0	0	0	0
Other MH Diagnoses	9	24	23	4	1	2	2
No Diagnosis, Deferred	18	2	8	1	0	0	0
Total	166	148	180	110	90	62	61
Depressive & Other Mood Disorders	53	62	69	15	9	5	4

Deceased Public Mental Health Clients and Major Mental Illness (MMI)

Adults with DSM codes 295-298

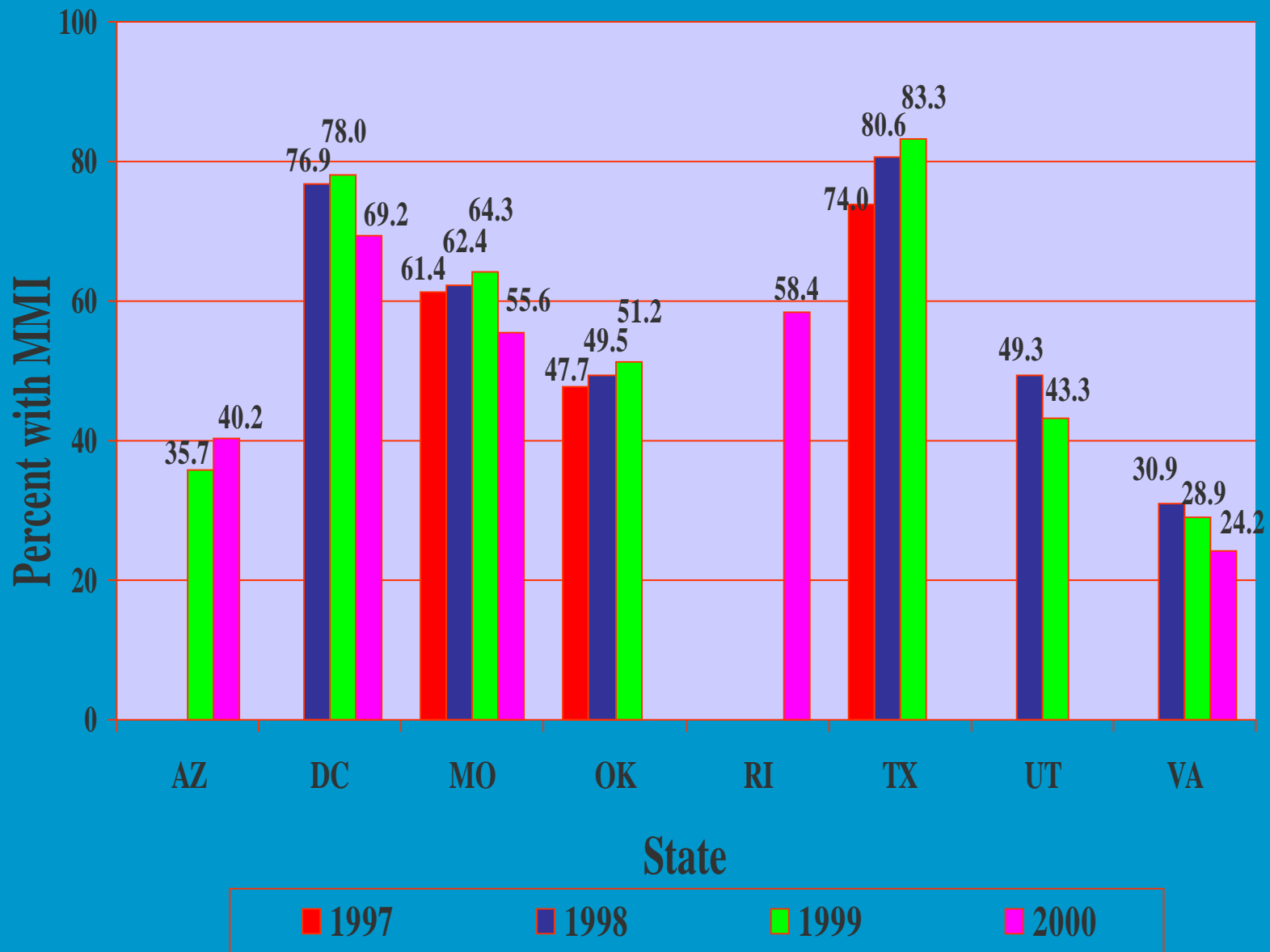
Children/Youth with DSM codes 295-298 & 314

**Table 6. Major Mental Ill (MMI) of Deceased Clients
Who Were Served During the Year in Which They Died**

	AZ 1999	AZ 2000	DC 1998	DC 1999	DC 2000	MO 1997	MO 1998	MO 1999	MO 2000	OK 1997	OK 1998
ADULTS											
With Major mental Illness	187	213	60	71	63	330	310	345	329	238	214
Other Adults	335	318	17	18	26	201	183	188	244	255	214
Missing									17		2
CHILD/YOUTH											
With Major Mental Illness	3	4	0	0	0	3	2	1	3	2	0
Other child/youth	7	5	1	0	2	8	5	4	4	8	2
TOTAL	532	540	78	91	91	542	500	538	597	503	432

	OK 1999	RI 2000	TX 1997	TX 1998	TX 1999 Jan- Aug	UT 1998	UT 1999	VA 1998	VA 1999	VA 2000	VA 2001
ADULTS											
With Major mental Illness	169	97	809	902	550	71	77	34	26	15	14
Other Adults	157	67	270	201	100	73	96	75	64	47	46
Missing	2							1			1
CHILD/YOUTH											
With Major Mental Illness	3	0	5	9	3	2	1	0	0	0	0
Other child/youth	5	2	16	18	11	2	6	0	0	0	0
TOTAL	336	166	1100	1130	664	148	180	110	90	62	61

Figure 17. Percent of Deceased Public Mental Health Clients with Major Mental Illness (MMI)



Mortality of Public Mental Health Clients with Major Mental Illness (MMI)

Adults with DSM codes 295-298

Children/Youth with DSM codes 295-298 & 314

Figure 18. Average Age at Time of Death for MMI and Non MMI Public Mental Health Clients

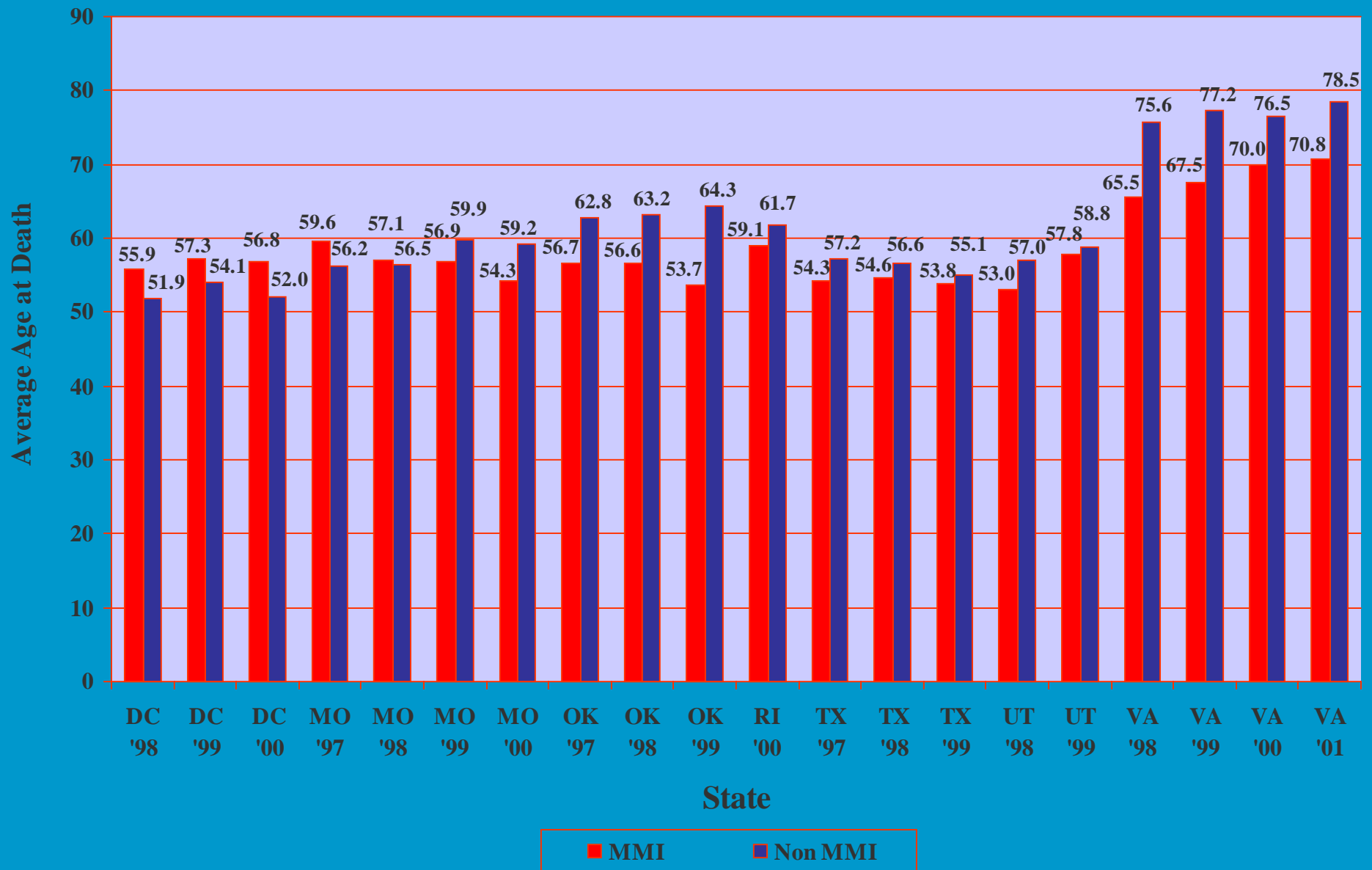
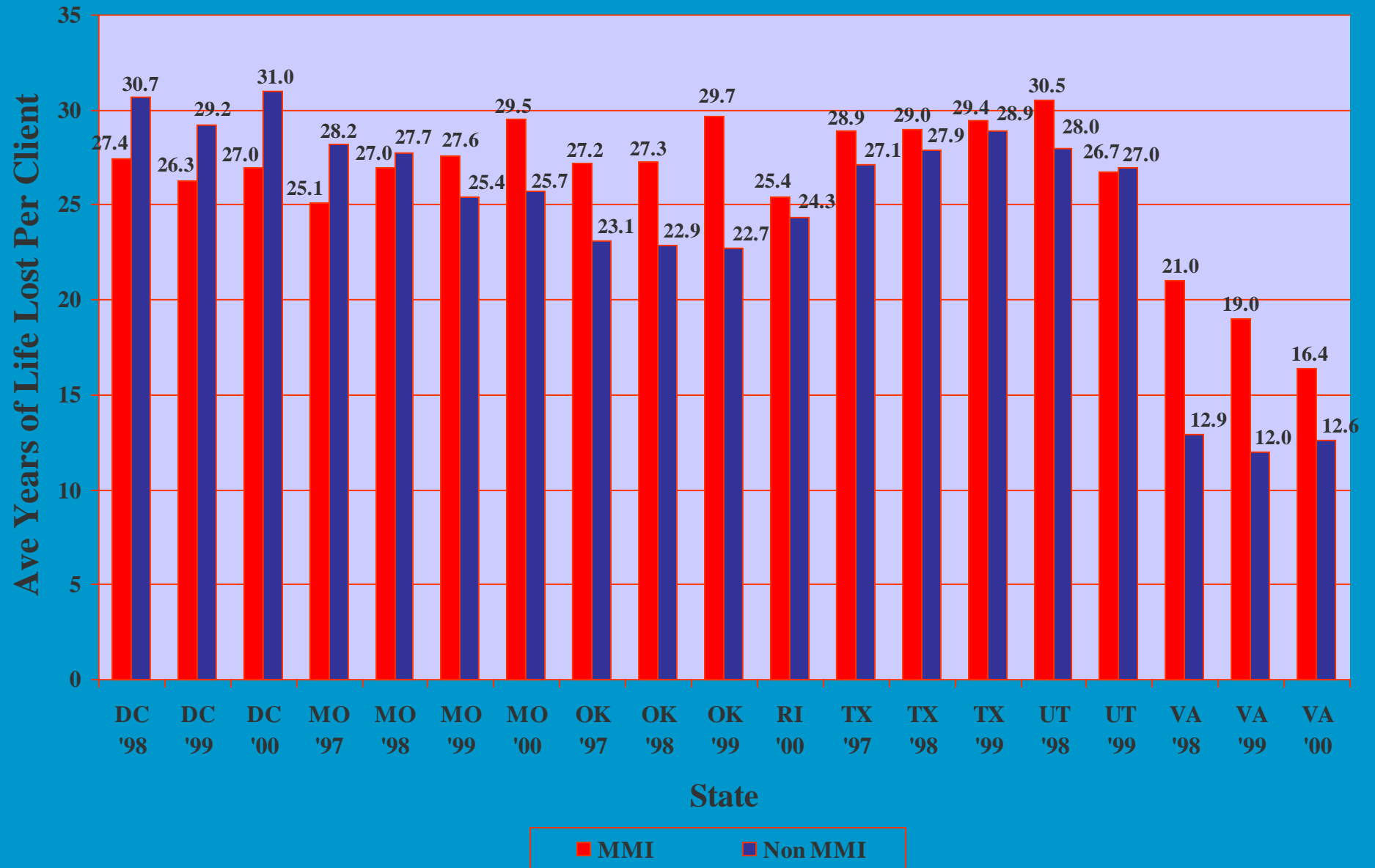


Figure 19. Average Number of Years of Life Lost (YLL) by Public Mental Health Clients with Major Mental Illness (MMI) and Those without MMI Who Died During a Year in Which a Service Was Received



Summary - Mortality of MH Clients with Major Mental Illness (MMI)

- In 15 out of 20 comparisons, MMI clients had shorter average lives than non MMI clients.
- In 5 states, MMI clients had shorter average lives during all years compared.
- In Missouri during 2 out of 4 years, MMI clients had shorter average lives.
- Only in Washington, D.C. did non MMI have shorter lives during all years submitted.
- In 13 out of 19 comparisons, MMI clients had higher average YLL than non MMI clients.

Causes of Death among Public Mental Health Clients

Examples

TEXAS

79 individuals who died while
waiting for mental health service
during a 32 month period,
Jan 1, 1997 - Aug 31, 1999

Texas Comparison of Deaths

Major Causes of Death

Statewide and MH Clients

Cause of Death	Texas CY 1998		MH	
Heart Disease	56,007	39.3%	25	31.6%
Liver-related	1,958	1.4%	1	1.3%
Kidney-related	1,096	0.8%	2	2.5%
Accidents	7,385	5.2%	14	17.7%
Suicides	2,131	1.5%	5	7.6%
Homicides	1,447	1.0%	0	0.0%
Other	72,365	50.8%	31	39.2%
Total Deaths	142,389	100.0%	79	100.0%

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Mental Health

**Mortality Report
1998-1999**



Marylou Sudders, Commissioner
May 2001

TABLE 3**Leading Causes of Death as Percentage of all Deaths:****1998****MASS**

- 1) Cardiac Disease
29%
- 2) Cancer
25%
- 3) Stroke
6%
- 4) Pulmonary Disease
5%
- 5) Pneumonia/Influenza
5%
- 6) Injuries
4%

DMH

- 1) Cardiac Disease
33.1%
- 2) Injuries (including accidents,
suicide, homicide)
16.5%
- 3) Cancer
15.0%
- 4) Pulmonary Disease
8.3%
- 5) Pneumonia
4.5%

1999**MASS**

- 1) Cardiac Disease
27.9%
- 2) Cancer
24.8%
- 3) Stroke
6.4%
- 4) Pulmonary Disease
5.1%
- 5) Injuries
4.2%
- 6) Pneumonia/Influenza
3.9%

DMH

- 1) Cardiac Disease
32.9%
- 2) Injuries (including accidents,
suicide, homicide)
14.6%
- 3) Pulmonary Disease
12.2%
- 4) Cancer
10.4%
- 5) Pneumonia
4.3%

Massachusetts - Causes of Death

- Natural causes accounted for 72.7% of DMH clients.
- Cardiac disease was the leading cause of death for DMH clients and statewide in both 1998 and 1999.
- Statewide, Cancer was #2 in both 1998 and 1999. For DMH, Cancer was #3 in 1998 and #4 in 1999.
- For DMH clients, Injuries, including accidents, suicide, homicide, were #2 in both 1998 and 1999.
- DMH clients had higher proportions of deaths from heart and pulmonary diseases than the general population of the state, but DMH clients had lower proportions of deaths from cancer.

Massachusetts Additional Findings

- Not only do DMH clients have higher proportions of deaths from heart and pulmonary diseases than the general population of the state, but:
- Cardiac events in the 25 - 54 age group are as much as six to seven times higher among DMH clients than for similar age individuals in the general population.
- Pulmonary disease is two to six times more problematic among DMH clients in the 25 - 64 age group than for similar age individuals in the general population.

Summary of Mortality Findings

- In 13 out of 22 comparisons, statewide **Crude Mortality Rates** were higher than MH client CMRs. CMRs are not standardized/adjusted.
- In 20 out of 22 comparisons, public mental health clients have higher **age adjusted mortality rates** than the general population of the state.
- Eight states have higher **age adjusted mortality rates** for mental health clients during every year submitted.

Summary of Mortality Findings

- In eight states across all years, the **Standardized Mortality Ratios** were greater than 1.0. Thus, the relative risk of death for mental health clients is higher than for the general population in each state.
- **Average death ages** for all MH clients ranged from 49 to 60, except in Virginia.
- On the average, **male MH clients** almost always **die at a younger age** than female MH clients.
- **25 to 32 years of life were lost** per client in every state, except Virginia (13 to 15 YLL per patient).

Mortality of MH Clients with MMI

- In 15 out of 20 comparisons, MMI clients had shorter average lives than non MMI clients.
- In 5 states, MMI clients had shorter average lives during all years compared.
- In 13 out of 19 comparisons, MMI clients had higher average YLL than non MMI clients.

Causes of Death among Public Mental Health Clients

- Leading causes of death for MH clients have similarities to those of individuals in state general populations.
- Age specific death rates are higher for MH clients at younger ages than for general state populations.
- Younger MH clients are dying of causes normally seen in the older population.

GENERAL CONCLUSION

- Public mental health clients are at higher risk for DEATH at an earlier age than the general population.

THE FUTURE

- Continue research to track mortality and primary care among mental health clients. (After all, THIS IS A MH RESEARCH CONFERENCE.)
- Develop/continue research about diagnosis specific risk and evidence based interventions. Example - Schizophrenia and diabetes
- Develop awareness among clients and service providers of mental health services and primary care.
- Develop best practices for the prevention of medical illness for people with mental illness.

A FINAL THOUGHT:

Integration of mental health care and primary medical care is highly recommended.

- from the World Health Organization (WHO) in NASW News, National Association of Social Workers, May 2002