THE DURATION OF PUBLIC ASSISTANCE EPISODES FOR THE ALCOHOL AND OTHER DRUG POPULATION OF NEW YORK STATE:

MODELS AND TRENDS 1993 - 1997

Nelson Toth, Ph.D., Robert J. Gallati, M.A., and Dawn A. Lambert-Wacey, M.A.

New York State
Office of Alcoholism and Substance Abuse Services

Primary Funding Source: U.S. Substance Abuse and Mental Health Administration, Center for Substance Abuse Treatment, Grant # 5 UR TI 11285

TERMS and ABBREVIATIONS

AOD: Alcohol and Other Drug (Treatment Population)

AFDC / TANF: Aid to Families with Dependent Children / Temporary Assistance to Needy Families

HR: Home Relief

MA Only: Medical Assistance Only

SSI: Supplemental Security Income

PDF: Probability Density Function

DATA

THE AOD POPULATION

Analyses were limited to individuals that were both:

(1) Eligible for Medicaid Assistance, AND
(2) Received AOD Treatment for at least one calendar month during the period of their Medicaid eligibility.

Medicaid Eligibility Data and Medicaid Claim Detail for FFYs 1993-1998 were provided by New York State Department of Health, Office of Medicaid Management by means of the SURS online data system.

FOCUS OF RESEARCH

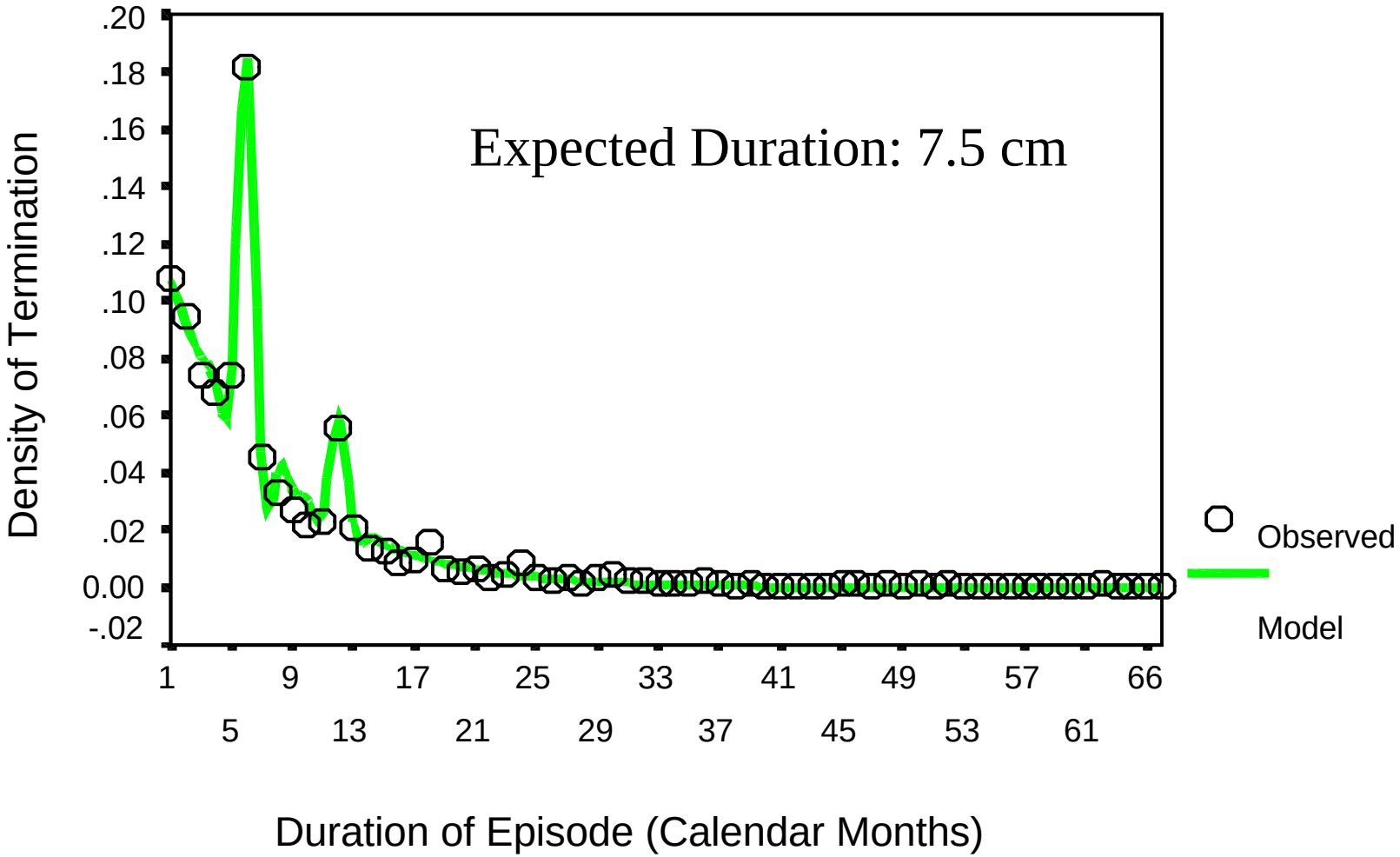
Examined here are trends in the duration of Public Assistance Episodes during the period 1993 through the 1st quarter of 1997.

The assistance categories AFDC/TANF, HR, MA Only, and SSI were evaluated separately. In addition, analysis was conducted for an ANY assistance category which subsumed all episodes of these four categories.

Probability Density Functions (PDFs) were derived for quarter-year start cohorts in each category of assistance. These PDFs were then modeled in terms of a mixture of gaussian and exponential densities and their expected values estimated.

Example of PDF for MA Only

Start Cohort: 1st Quarter of 1993



ANALYTIC PROCEDURE

1. **Empirical Survival Functions, S(t), derived from Survival Analyses of Episode Duration Data. Separate analyses performed for each quarter-year start cohort (1993 through the 1st quarter of 1997) for *AFDC/TANF, HR, MA Only* assistance categories. Analyses also performed for an aggregated *ANY* assistance category.**

2. **Underlying Cumulative Distribution Functions computed as $F(t) = 1 - S(t)$.**

3. **Corresponding Probability Density Functions computed as $f(t) = F(t) - F(t-1)$.**

4. **Nonlinear Regression of PDFs used to evaluate parameter values (i.e. ω_1, ω_2, μ_1, μ_2, σ, and λ) that yield best least squares fit to the mixture model, m(t). Note that a common σ is assumed for both Gaussian components.**

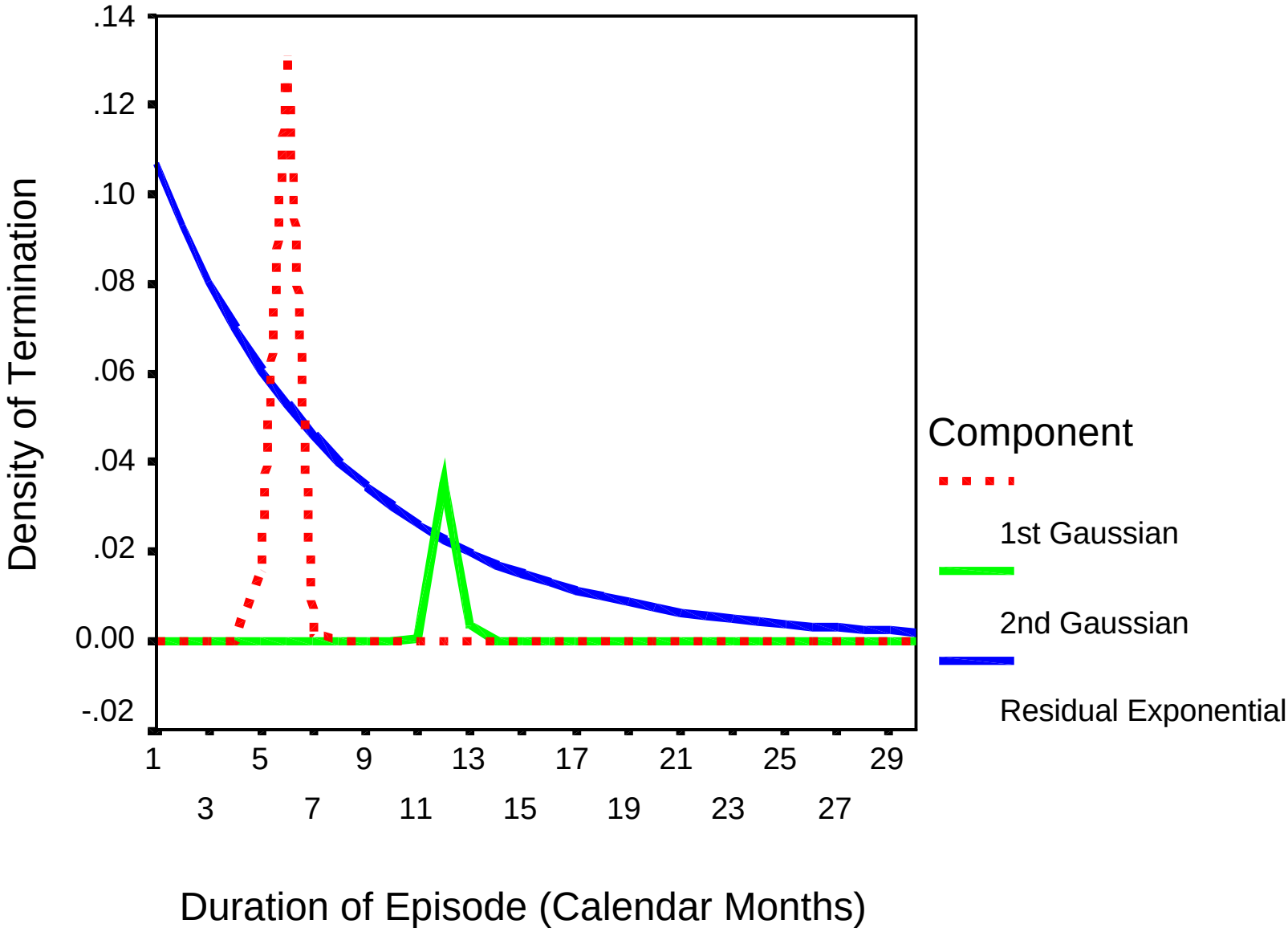
5. **Expected values for the duration of episodes for each quarter-year cohort approximated as $E[t] = \sum [(t-.5)\, m(t)]$ for t = [1 … 1000].**

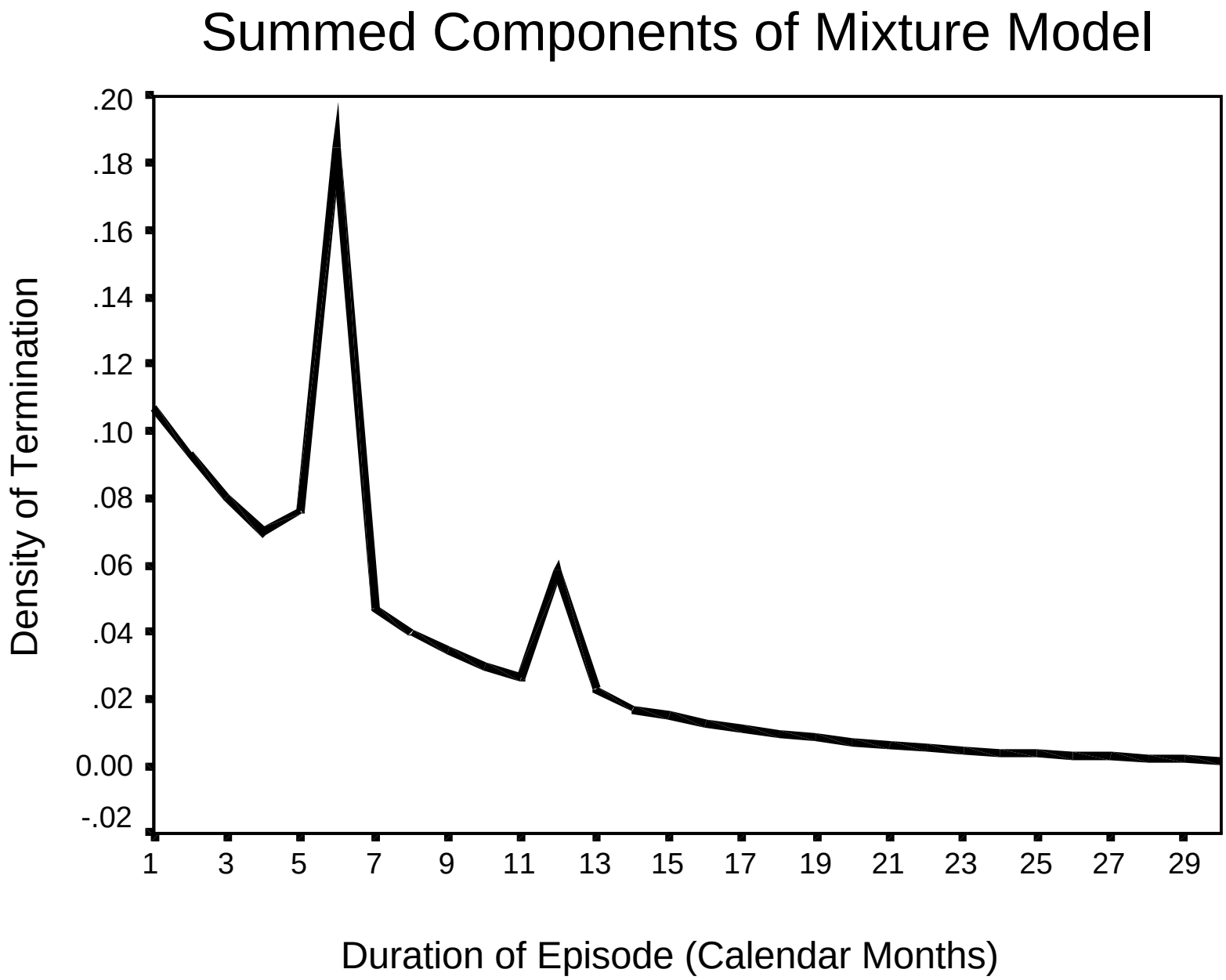
The Duration of Public Assistance Episodes: A Gaussian-Exponential Mixture Model

$$m(t) = \omega_1 \left[\frac{\frac{1}{\sigma\sqrt{2\pi}} \int_{t-1}^{t} e^{-\frac{1}{2}\left(\frac{t-\mu_1}{\sigma}\right)^2} dt}{\frac{1}{\sigma\sqrt{2\pi}} \int_{0}^{t_{\max}} e^{-\frac{1}{2}\left(\frac{t-\mu_1}{\sigma}\right)^2} dt} \right] + \omega_2 \left[\frac{\frac{1}{\sigma\sqrt{2\pi}} \int_{t-1}^{t} e^{-\frac{1}{2}\left(\frac{t-\mu_2}{\sigma}\right)^2} dt}{\frac{1}{\sigma\sqrt{2\pi}} \int_{0}^{t_{\max}} e^{-\frac{1}{2}\left(\frac{t-\mu_2}{\sigma}\right)^2} dt} \right] + \left(1-\omega_1-\omega_2\right) \int_{t-1}^{t} \left(1-e^{-\lambda t}\right) dt$$

1st Weighted Gaussian Density (Truncated) + 2nd Weighted Gaussian Density (Truncated) + Residual Exponential Density

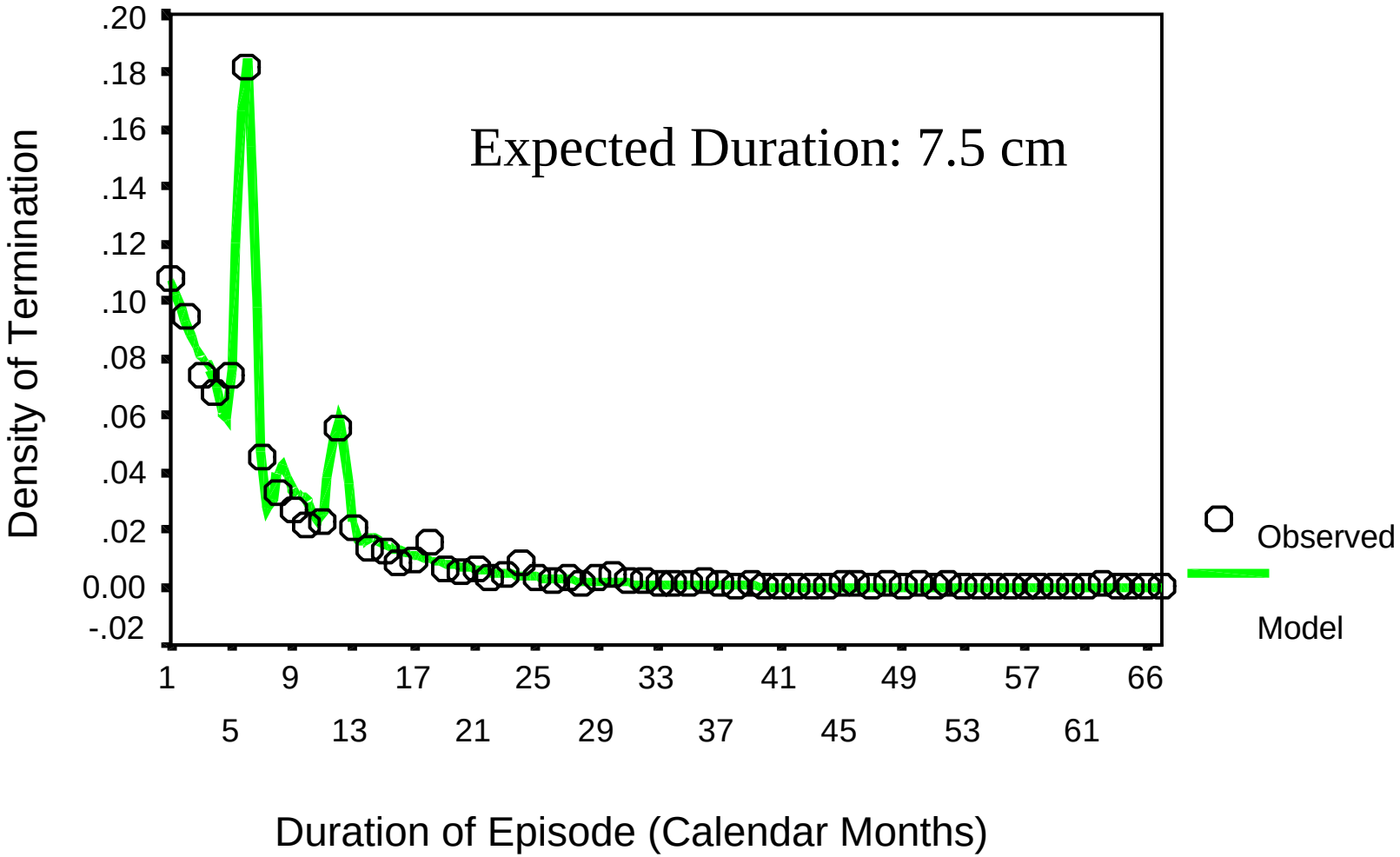
Components of the Mixture Model




Summed Components of Mixture Model
Density of Termination
.20
.18
.16
.14
.12
.10
.08
.06
.04
.02
0.00
-.02
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
Duration of Episode (Calendar Months)

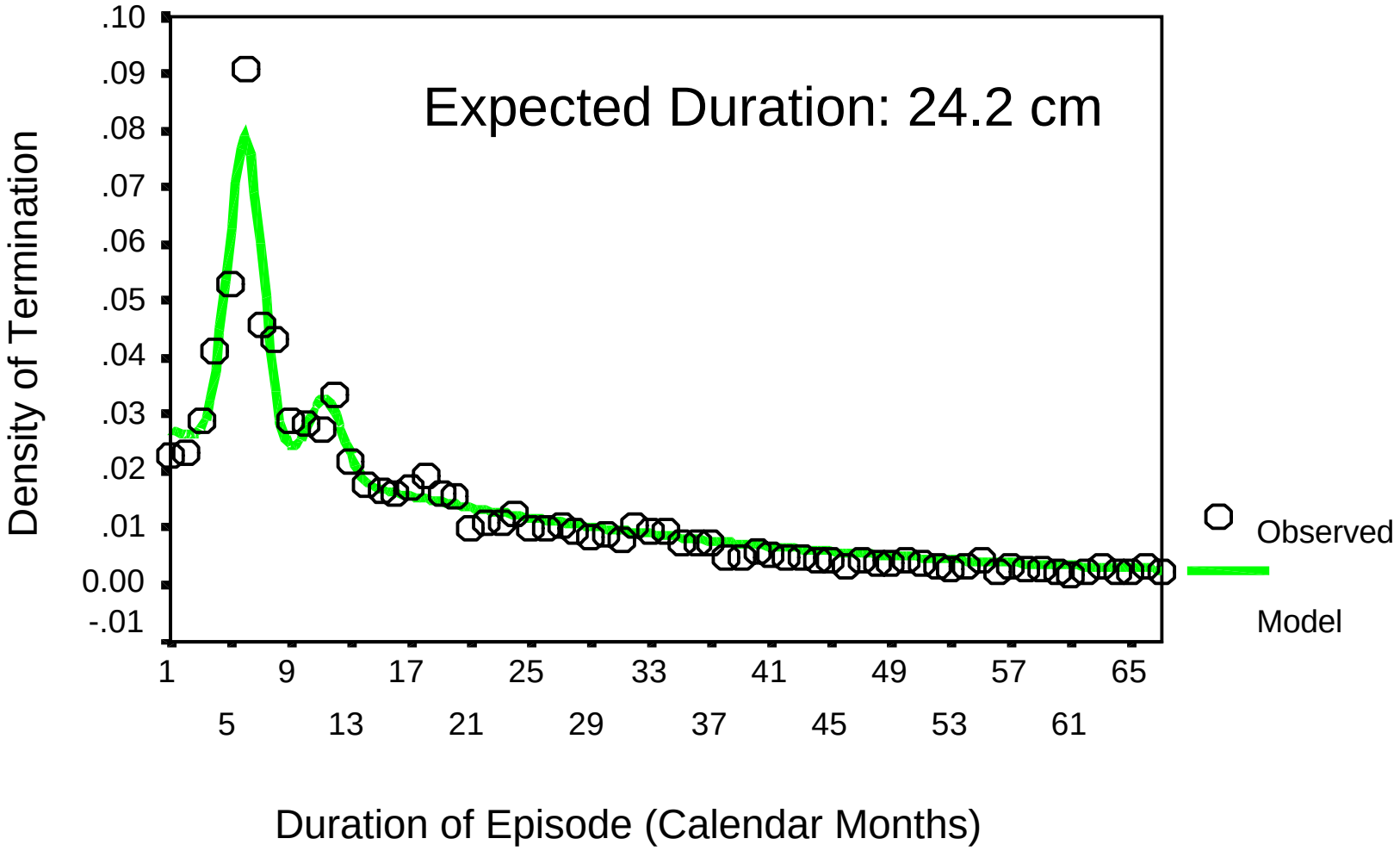
Example of PDF for MA Only

Start Cohort: 1st Quarter of 1993



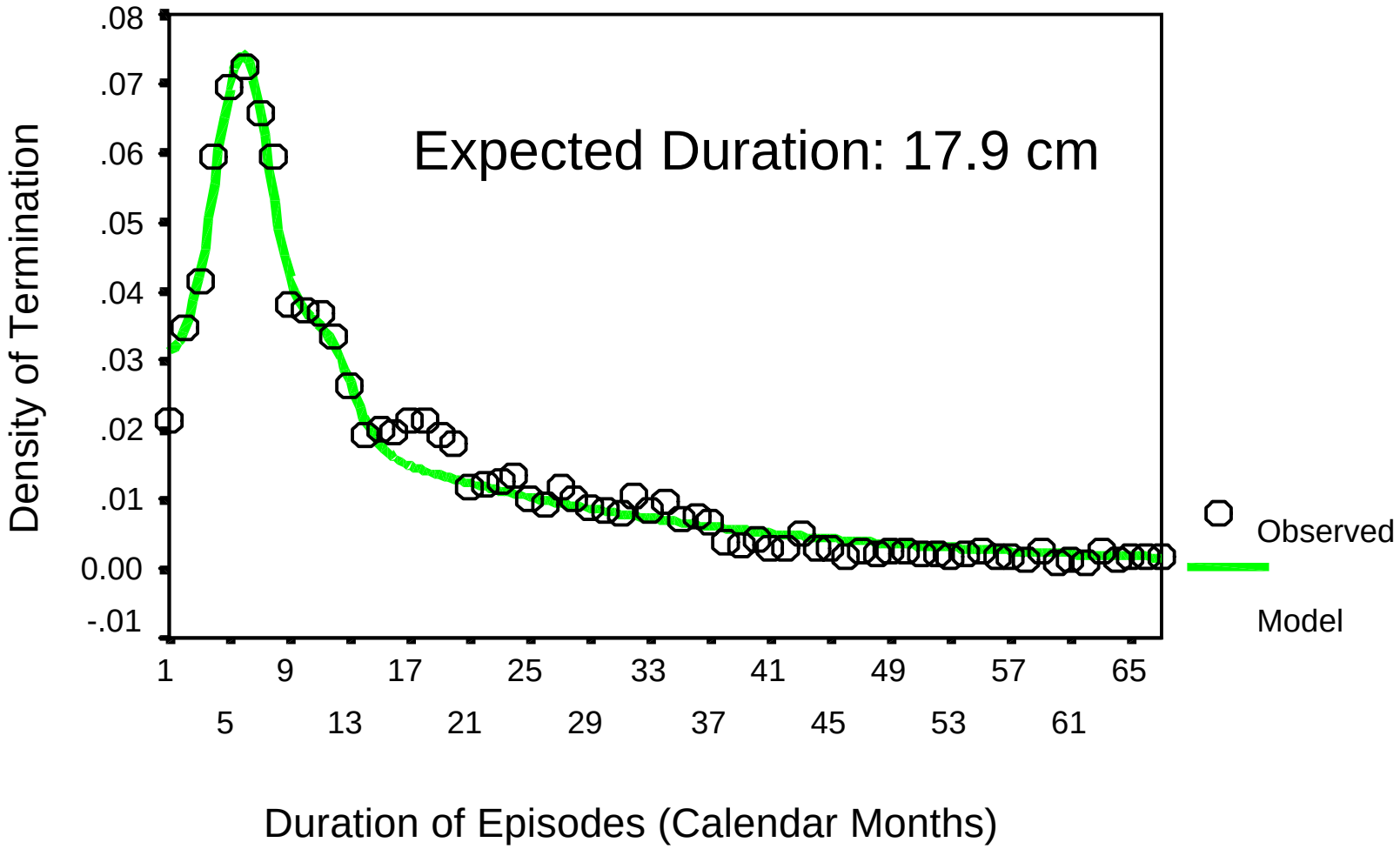
Example of PDF for ANY Assistance

Start Cohort: 1st Quarter of 1993



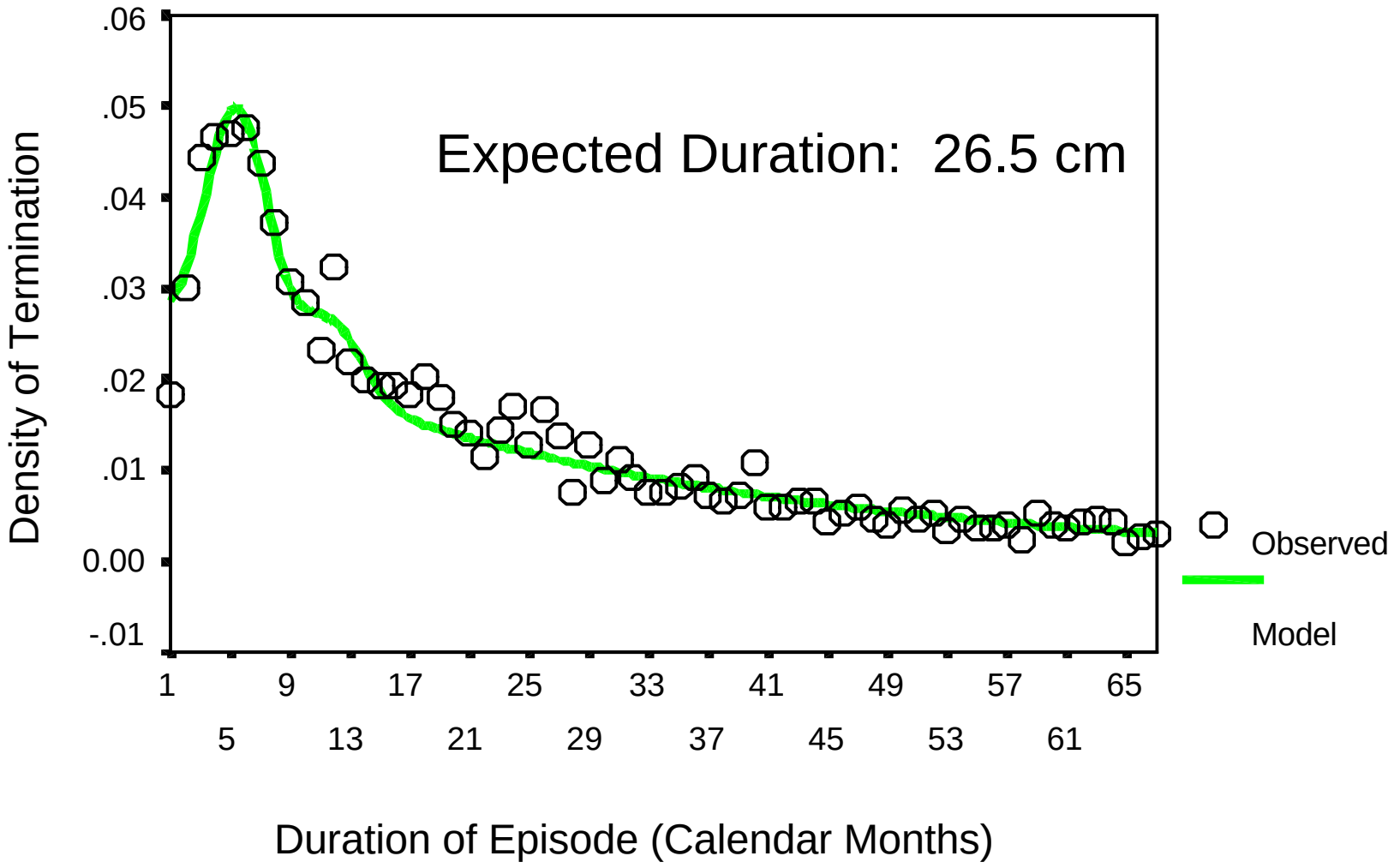
Example of PDF for HR

Start Cohort: 1st Quarter of 1993



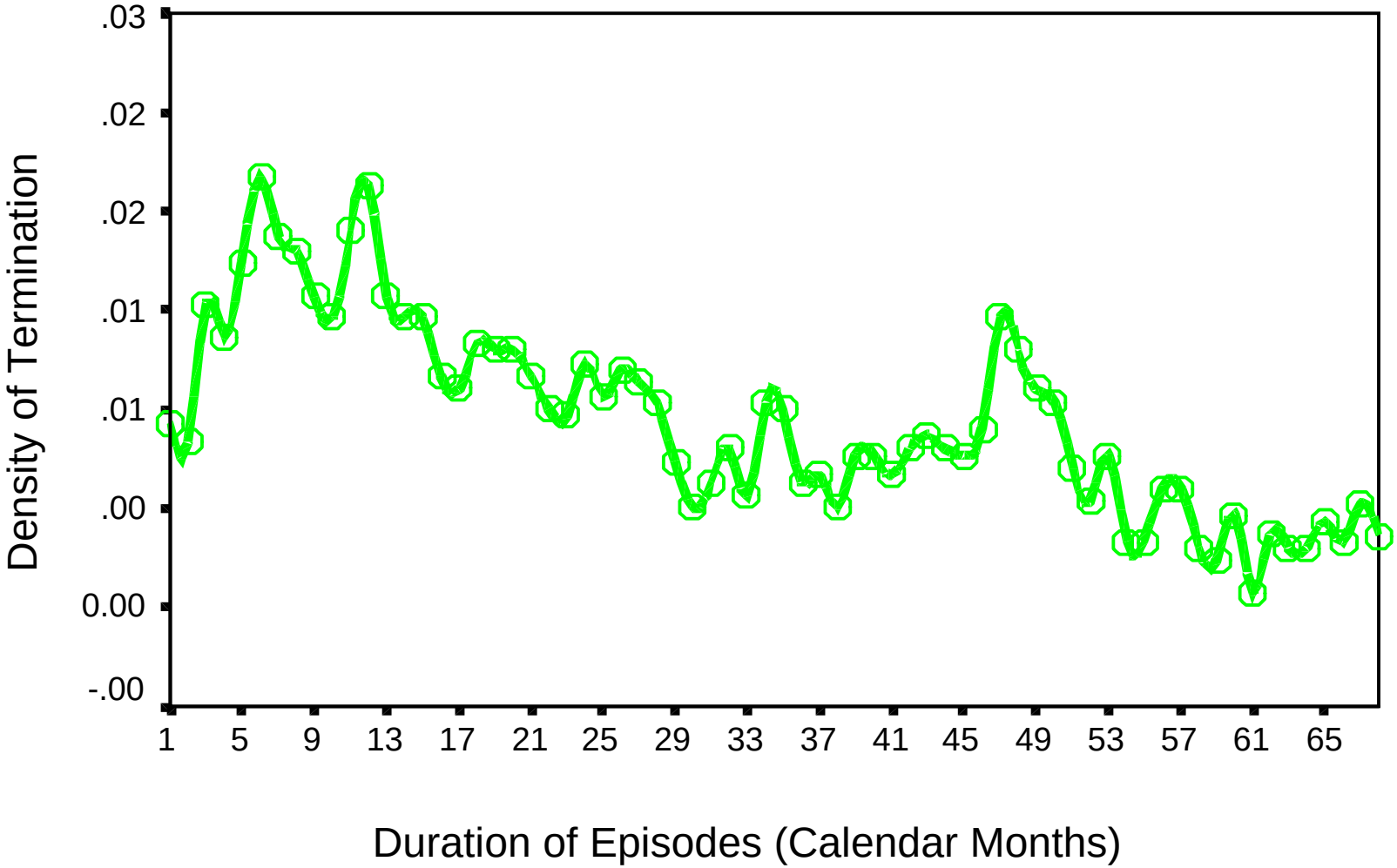
Example of PDF for AFDC/TANF

Start Cohort: 1st Quarter of 1993



Example of PDF for SSI

Start Cohort: 1st Quarter of 1993



Summary of Findings

1. ***ANY* assistance: The expected duration for any public assistance declined from approximately 24 to 17 calendar months during the period 1st quarter of 1993 through the 2nd quarter of 1997.**

2. ***AFDC/TANF:* The expected duration of *AFDC/TANF* assistance declined from approximately 27 to 17 calendar months during the period 1st quarter of 1993 through the 1st quarter of 1997.**

3. ***HR:* The expected duration of *HR* assistance declined from approximately 18 to 13 calendar months during the period 1st quarter of 1993 through the 1st quarter of 1997.**

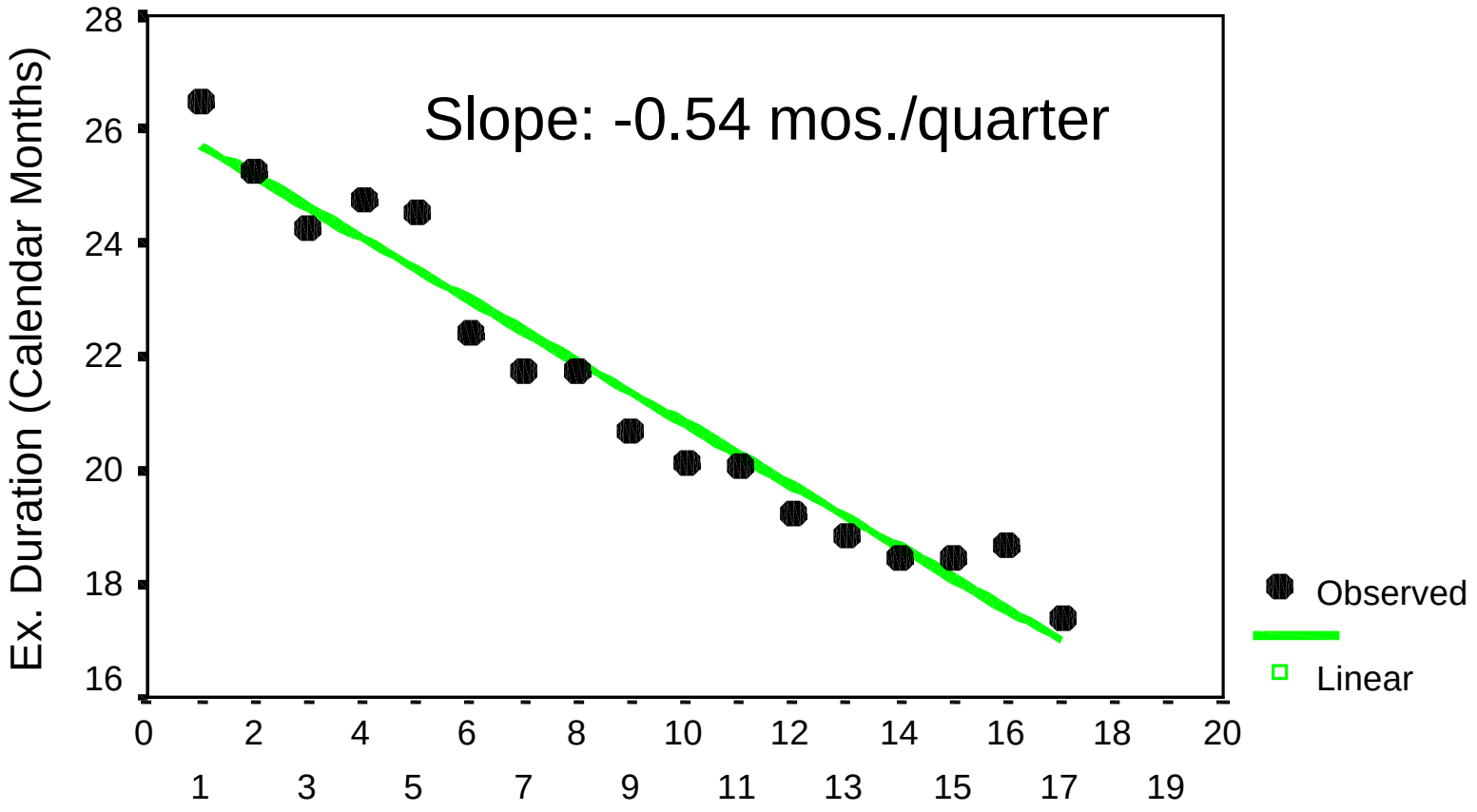
4. ***MA Only:* The expected duration of *MA Only* assistance remained essentially unchanged at 7.5 calendar months during the period 1st quarter of 1993 through the 2nd quarter of 1997.**

5. ***SSI:* It was not possible to obtain estimates of the expected duration of *SSI* assistance due to the complexity of the episode duration data.**

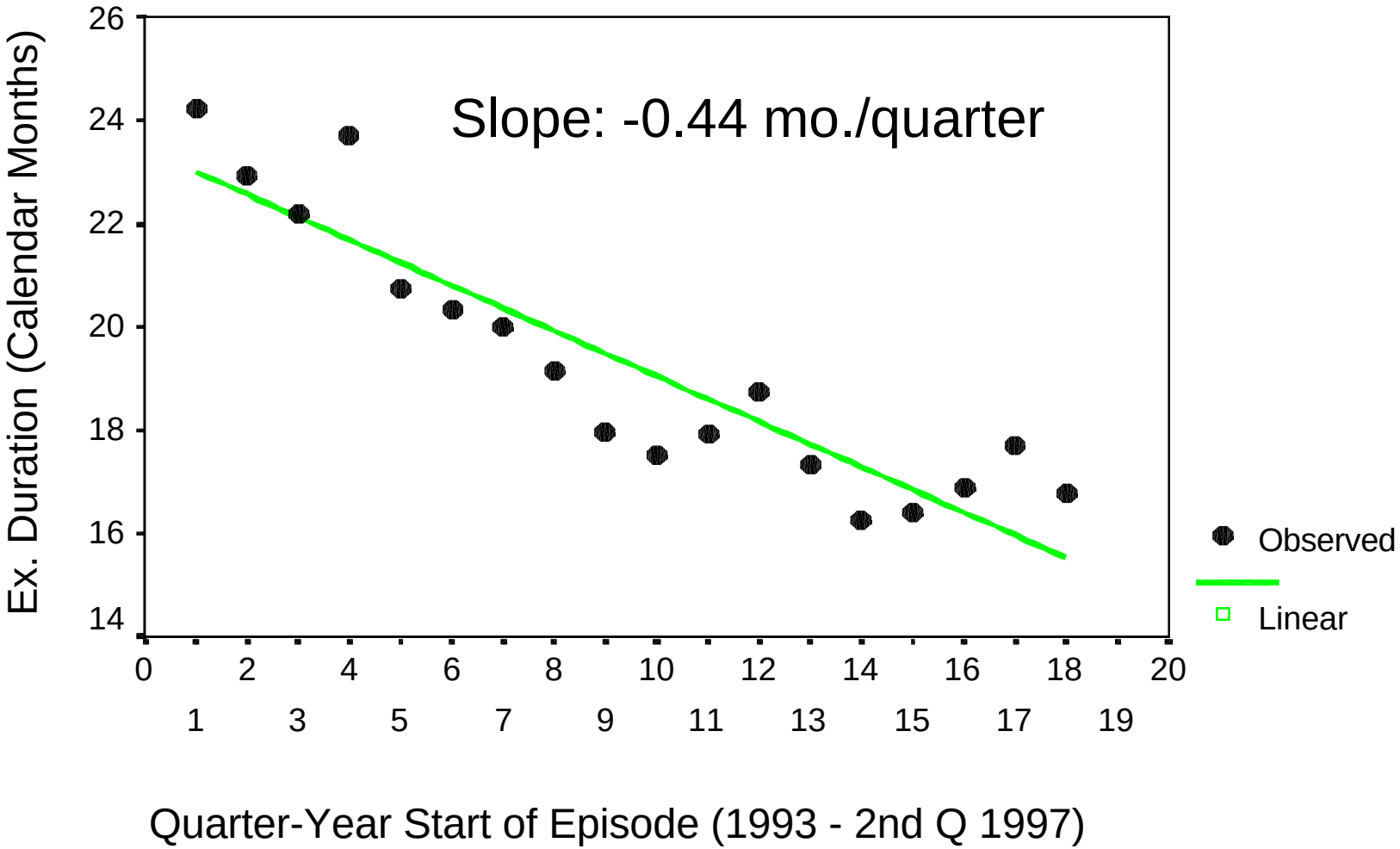
R^2 VALUES FOR MIXTURE MODELS

COHORT	ANY PUBLIC ASSISTANCE	HR	MA ONLY	AFDC / TANF
1st Quarter 1993	.95	.98	.99	.96
2nd Quarter 1993	.97	.98	.99	.96
3rd Quarter 1993	.94	.97	.99	.97
4th Quarter 1993	.92	.96	.99	.96
1st Quarter 1994	.95	.97	.99	.95
2nd Quarter 1994	.93	.97	.99	.96
3rd Quarter 1994	.95	.98	.99	.95
4th Quarter 1994	.93	.97	.98	.94
1st Quarter 1995	.97	.98	.98	.96
2nd Quarter 1995	.95	.99	.98	.96
3rd Quarter 1995	.96	.97	.98	.94
4th Quarter 1995	.92	.97	.98	.96
1st Quarter 1996	.93	.96	.97	.96
2nd Quarter 1996	.94	.94	.97	.97
3rd Quarter 1996	.93	.95	.96	.96
4th Quarter 1996	.81	.97	.96	.93
1st Quarter 1997	.88	.94	.92	.92
2nd Quarter 1997		.96		.90

Expected Duration of AFDC/TANF Episodes for the AOD Population of NY State

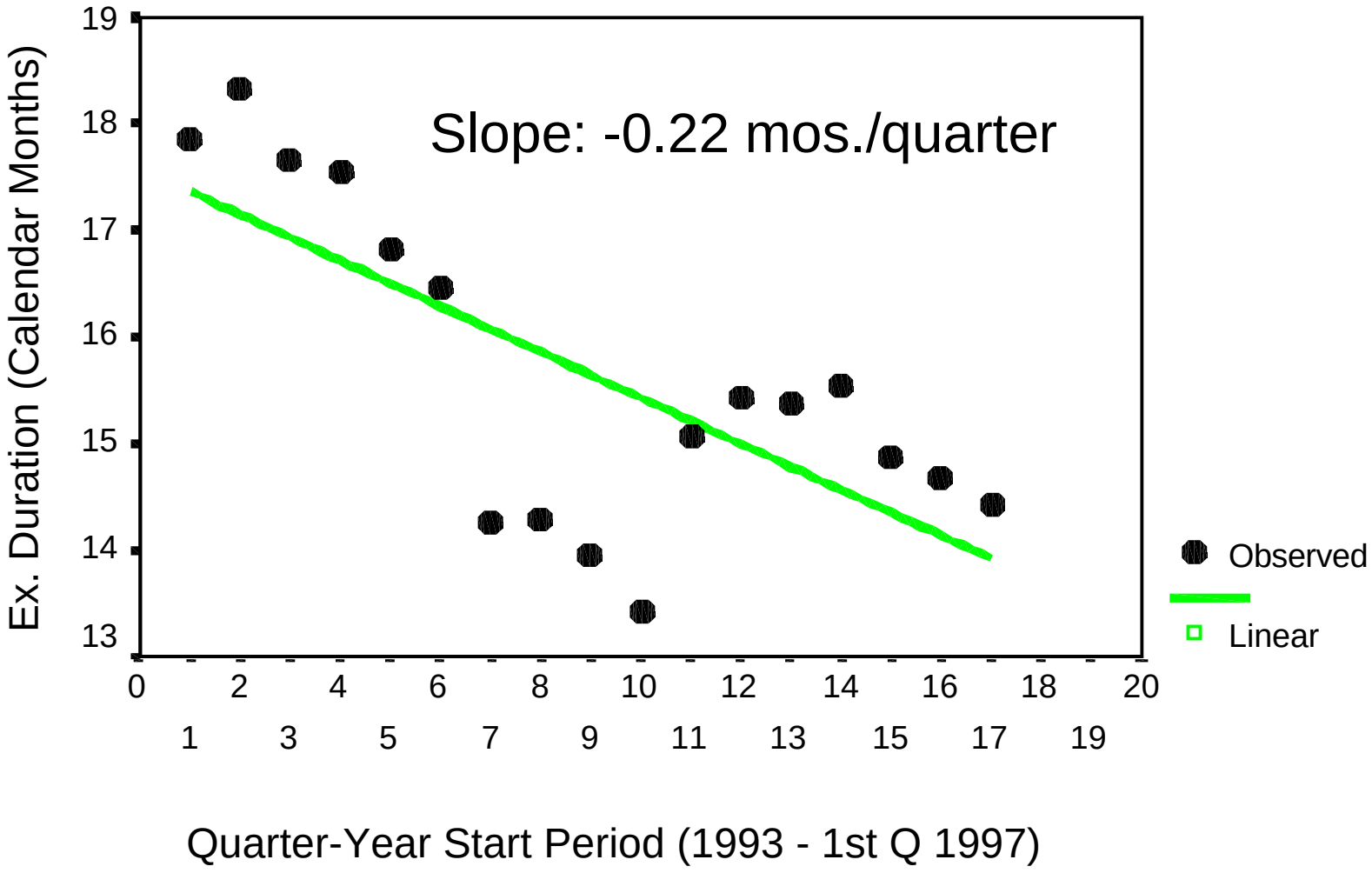


Expected Duration of Public Assistance for the AOD Population of NY State

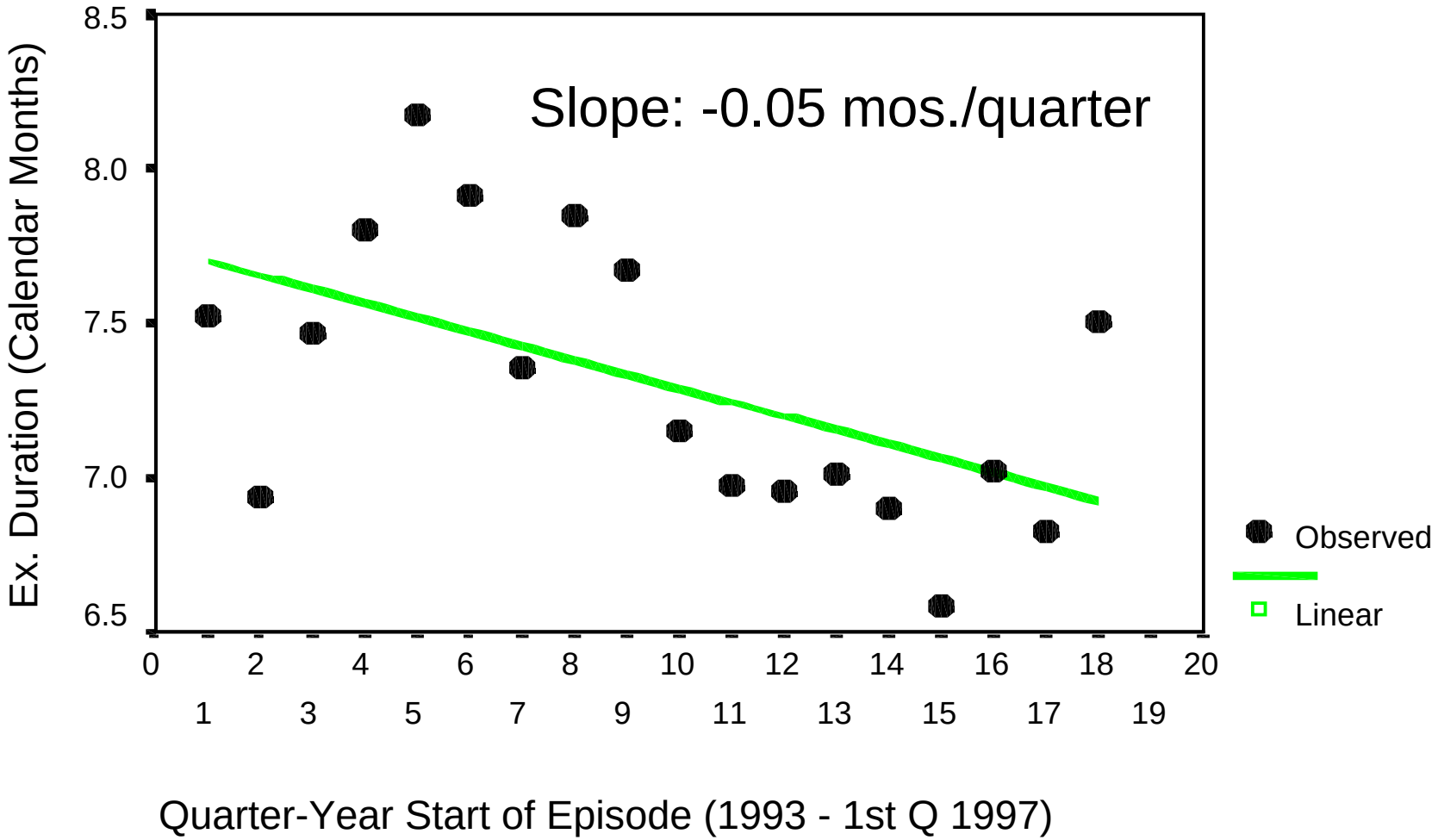


Expected Duration of HR Episodes

for the AOD Population of NY State



Expected Duration of MA Only Episodes for the AOD Population of NY State



Downward Trends in Expected Duration Not an Artifact of Censoring

1. **1st Quarter of 1993 ANY Public Assistance data modeled under four conditions of censoring: 68 , 34, 17 & 15 observations. These conditions correspond to the start cohorts of the 1st Quarter of 1993, the 4th Quarter of 1995, 1st Quarter of 1997, and 2nd Quarter of 1997.**

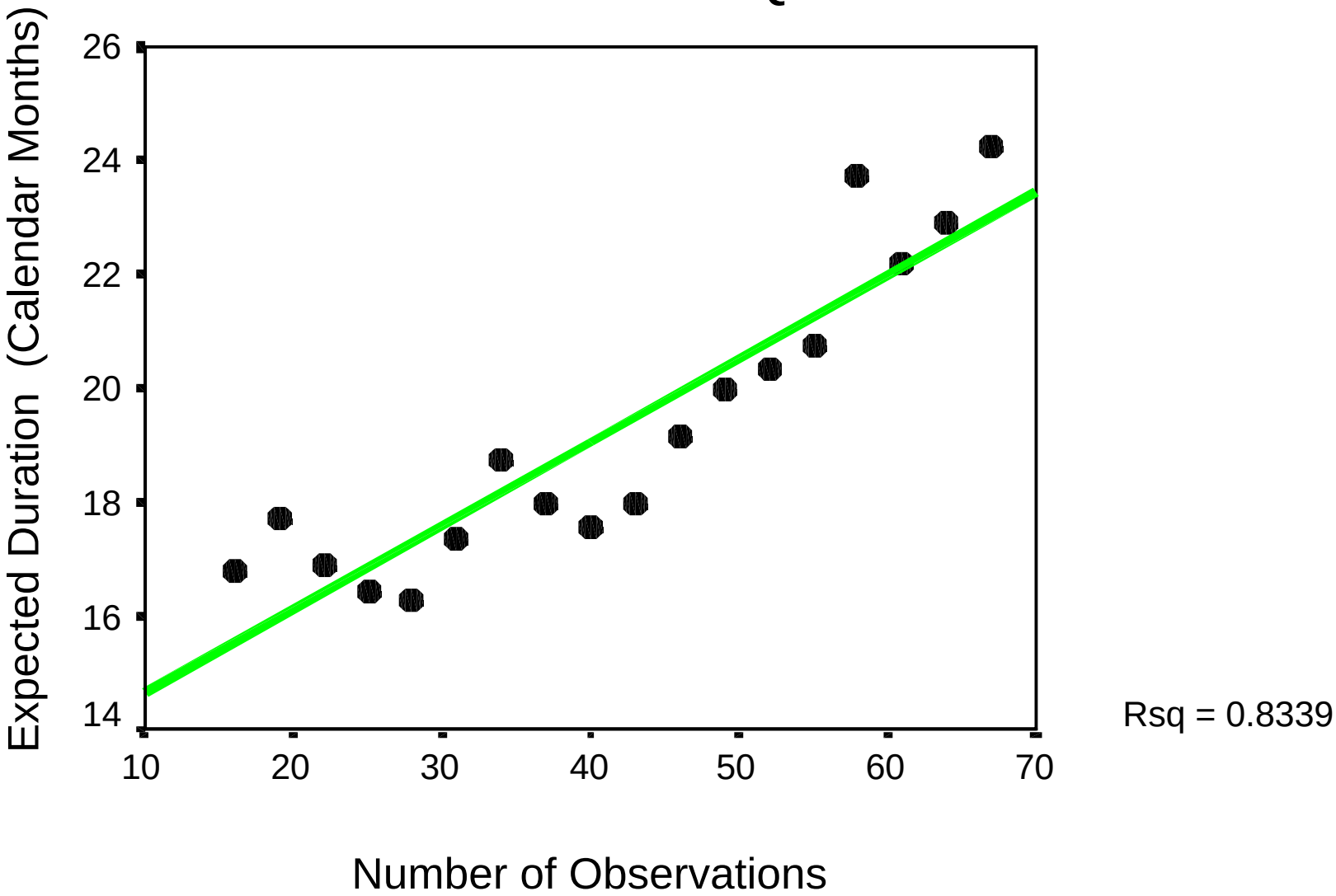
2. **Identical PDFs were derived from Survival Analyses over their corresponding ranges of observations.**

3. **Parameter values demonstrated stability in all conditions of censoring.**

4. **Expected durations evaluated to within one calendar month in all conditions of censoring.**

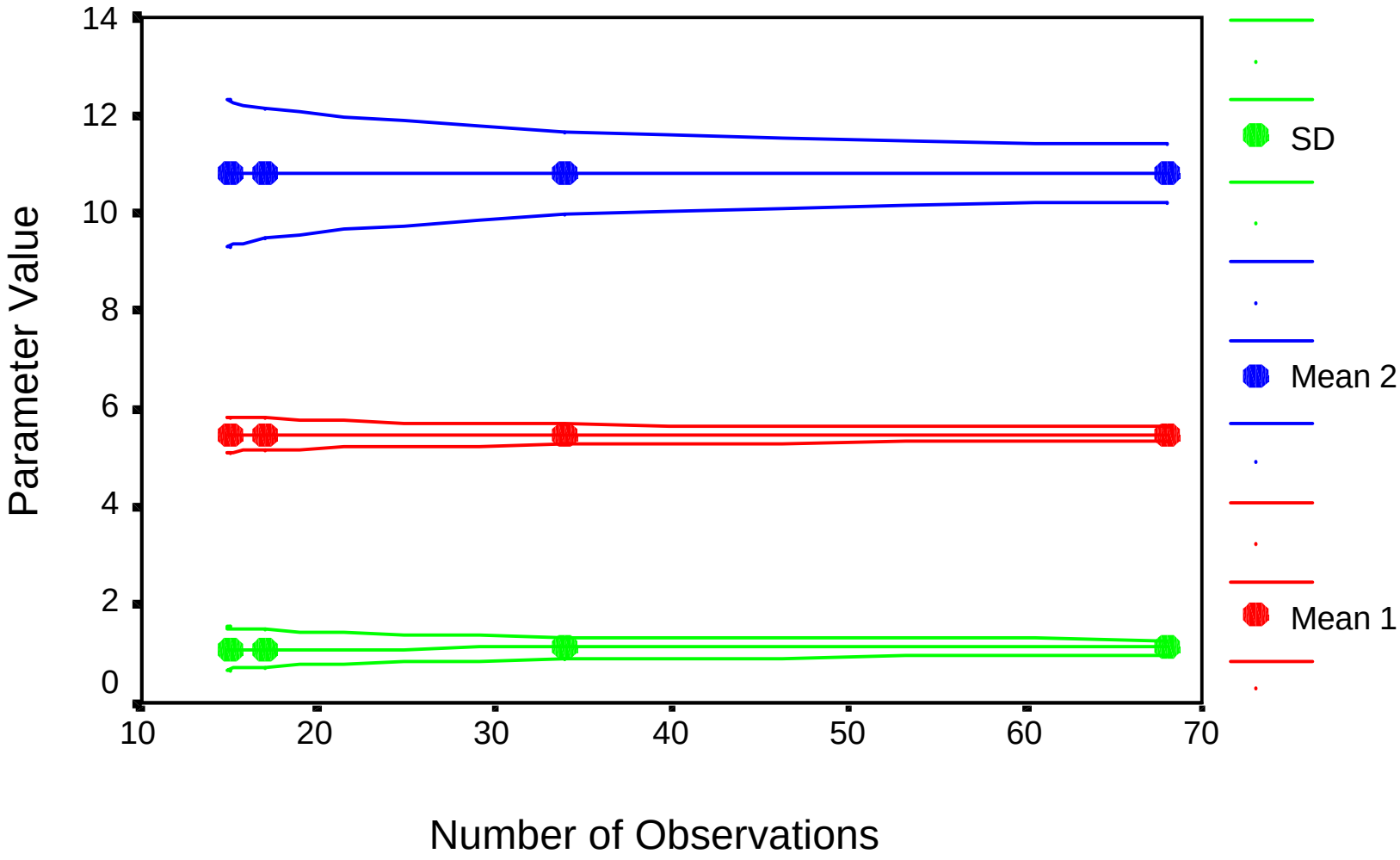
Exp. Duration v. Number of Observations

ANY Public Assistance: 1st Quarter of 1993



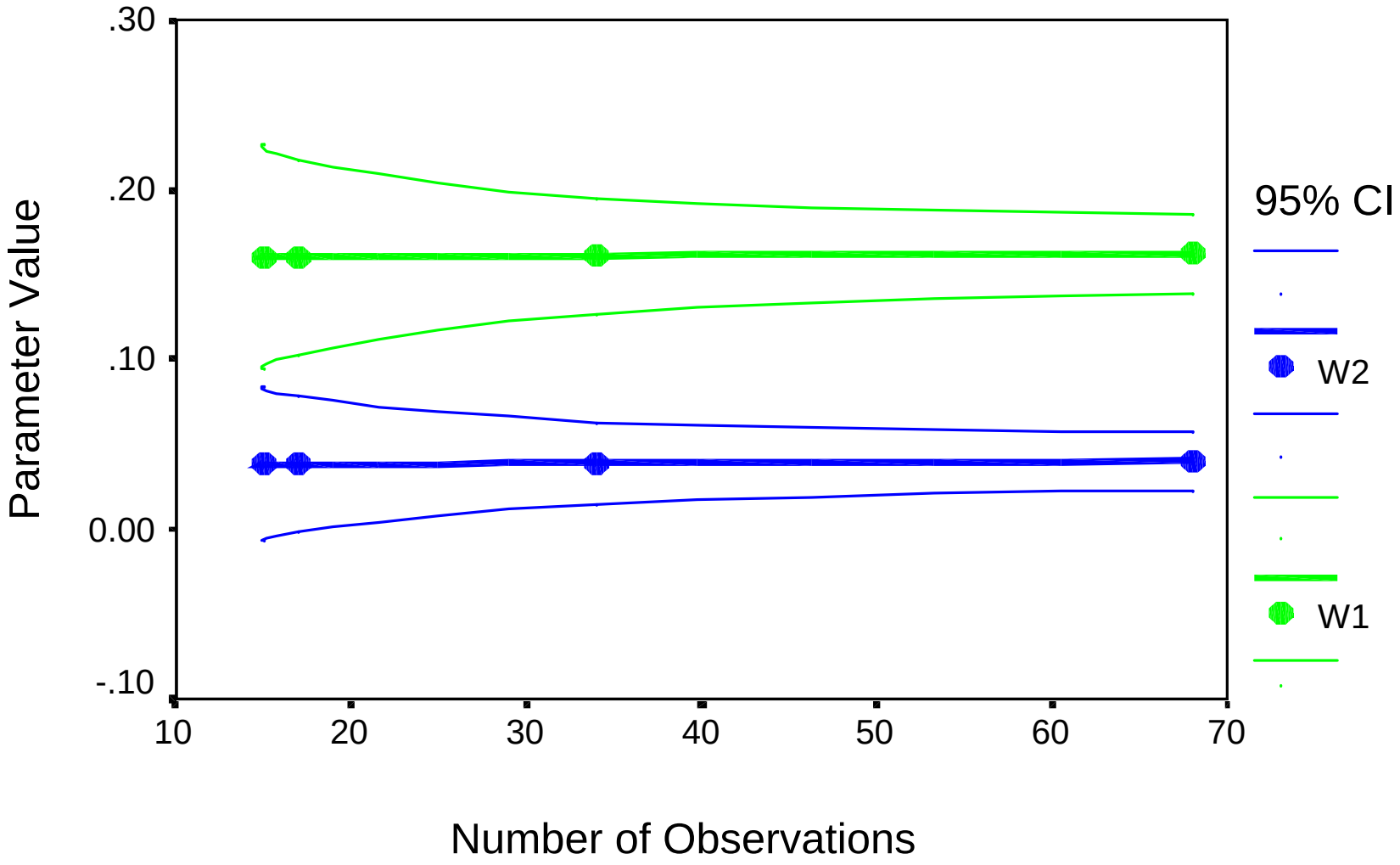
Stability of Gaussian Params. Under Censoring

ANY Public Assistance: 1st Quarter pf 1993



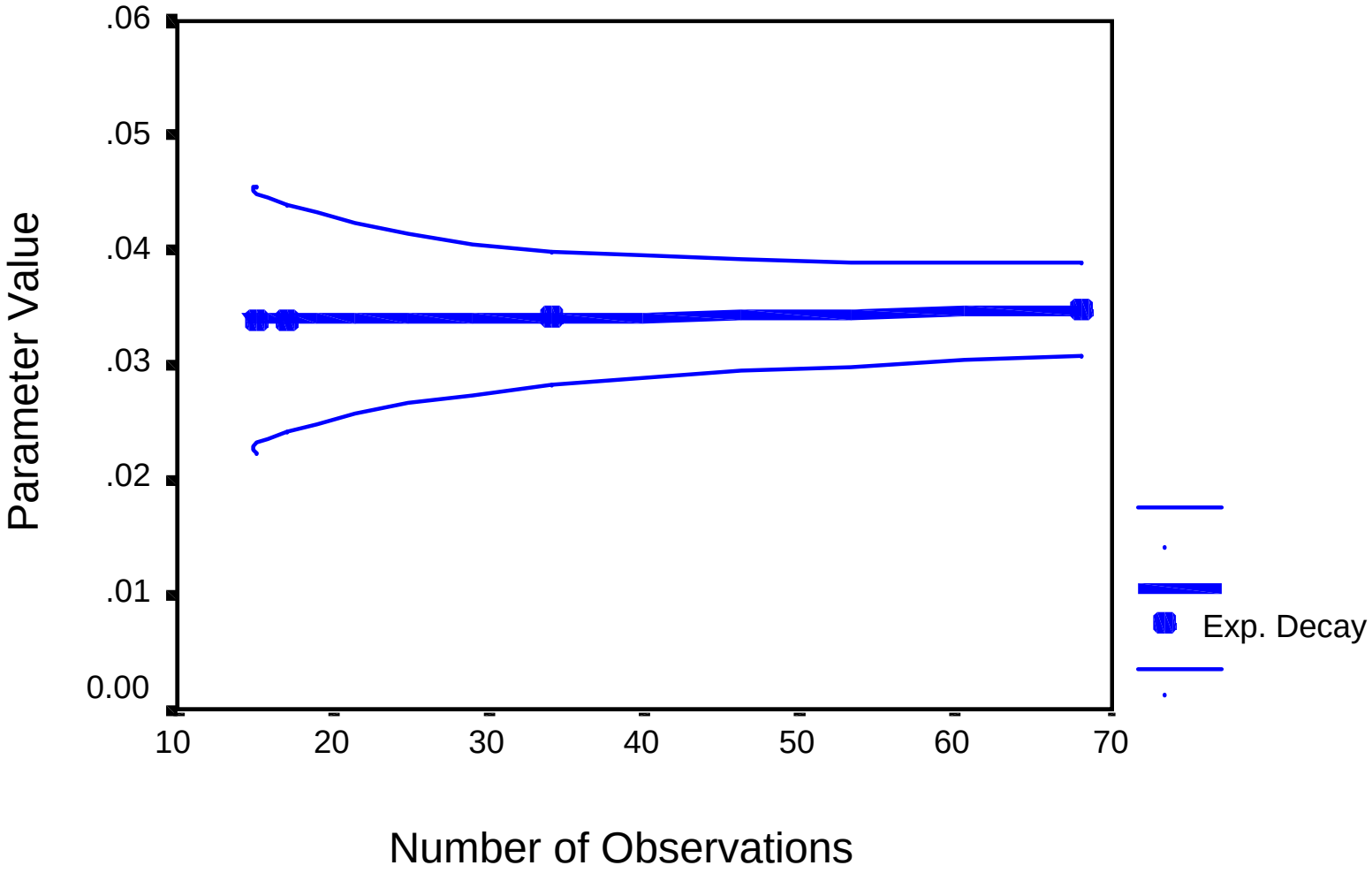
Stability of Gaussian Weights Under Censoring

ANY Public Assistance: 1st Quarter of 1993



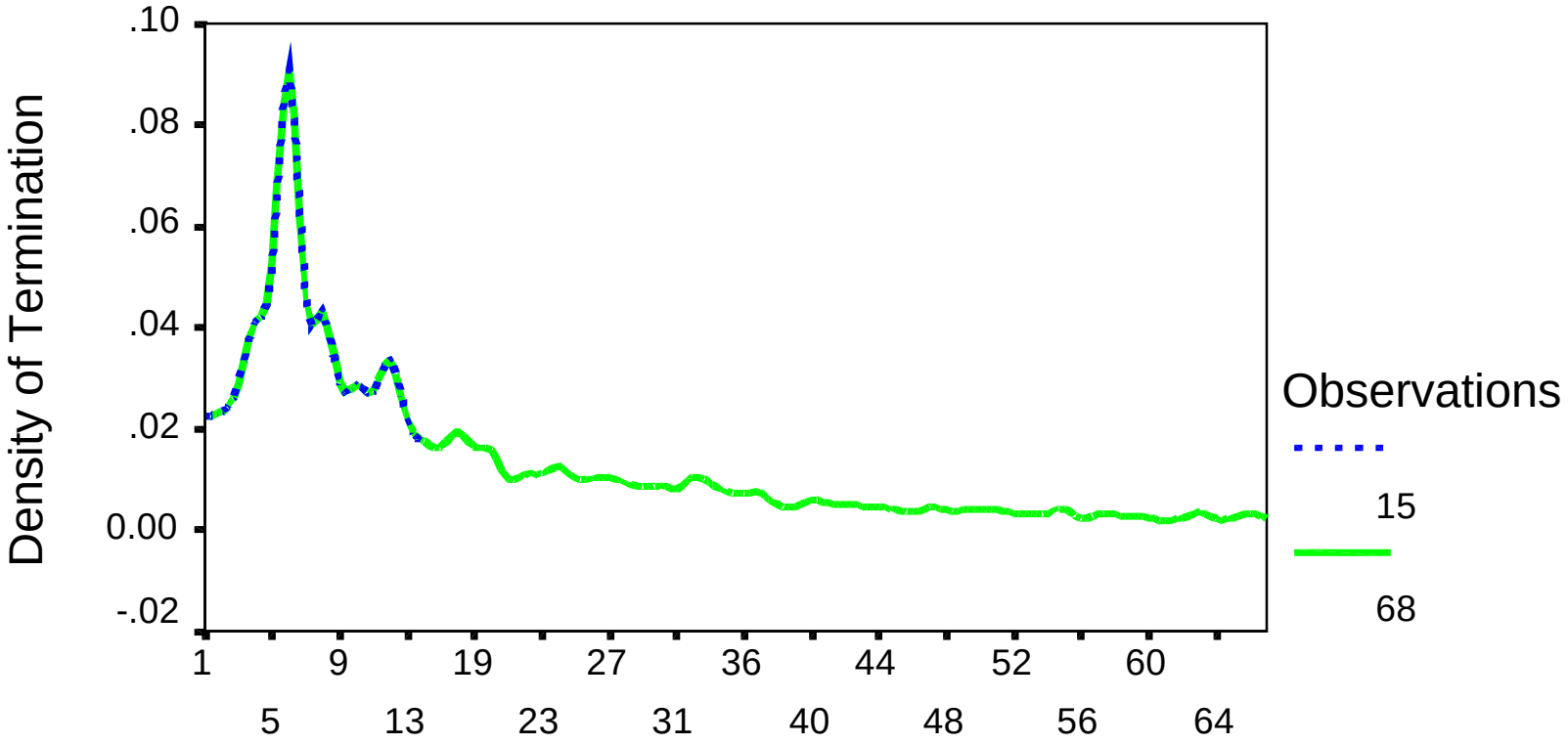
Stability Of Exp. Params. Under Censoring

ANY Public Assistance: 1st Quarter of 1993



PDF for Termination from All Public Assistance

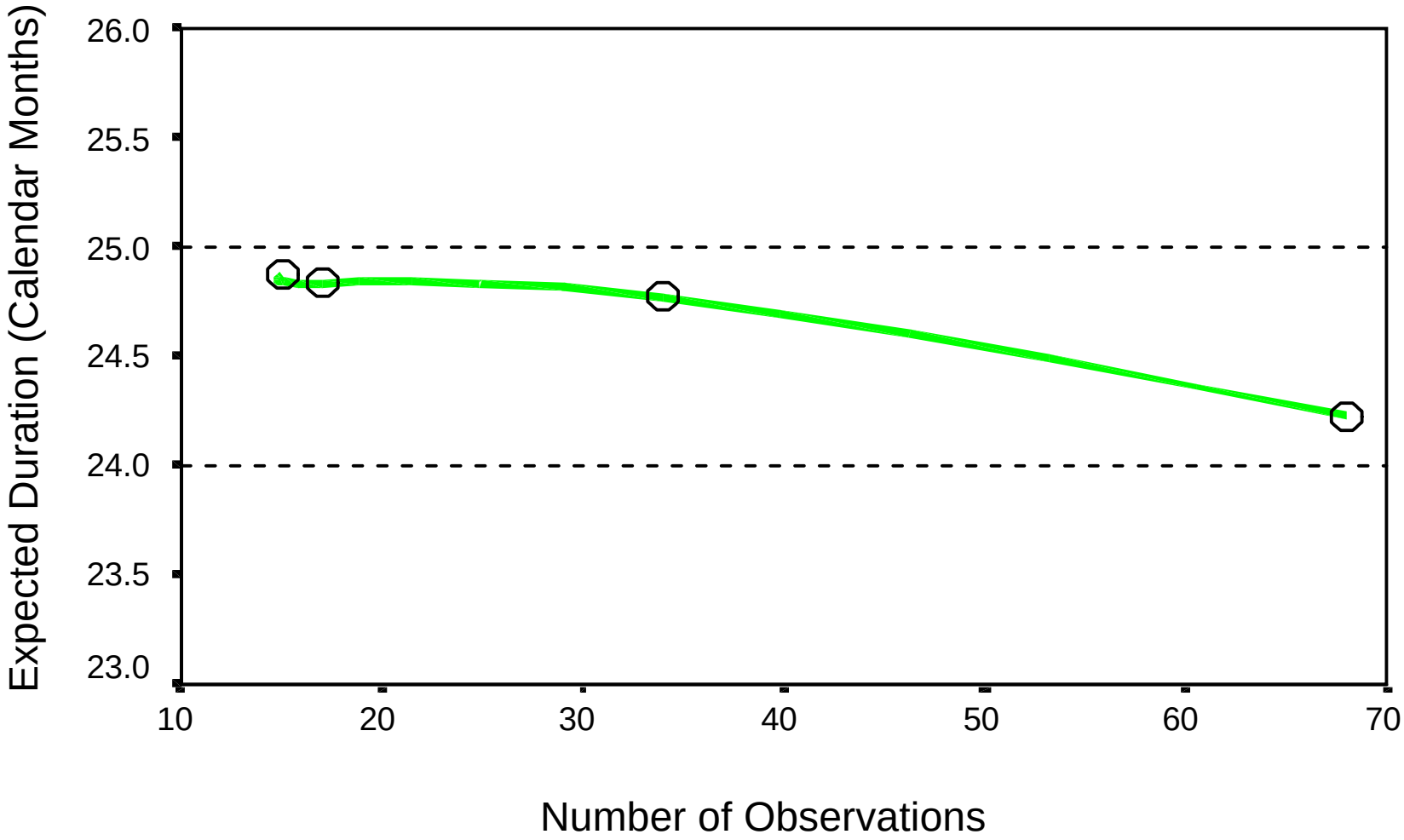
Start Cohort: 1st Quarter of 1993



PDF derived from Empirical Survival Function.

Effect of Truncation on Expected Duration

ANY Public Assistance: 1st Quarter of 1993



IMPLICATIONS FOR POLICY

Reductions in the duration of Medicaid eligibility episodes for individuals receiving AOD treatment undermines the efforts of Medicaid Managed Care Organizations to provide a continuity of medical and AOD care for this population.

The trend towards a more time-limited Medicaid eligibility may result in a loss of Medicaid reimbursement to AOD treatment providers and promote a greater reliance on deficit funding of State Alcoholism and Substance Abuse Agencies.