Calculation of Net (Pohar-Perme) Survival in SEER*Stat

Variables	"Kaplan-Meier" (Stata-stns) life table approximation of for interval grouped data	Actuarial 1 (Stata –strs-)
Death indicator,	$d_{ij}=1,\ j$ died in interval i $d_{ij}=0,\ j$ did not die at interval i	$d_{ij}=1,\ j$ died in interval i $d_{ij}=0$, j did not die at interval i
y_{ij} at risk at start of interval	$y_{ij}=1,\ j$ at risk the start of the interval i $y_{ij}=0,\ j$ not at risk the start of the interval i	$y_{ij}=1,\ j$ at risk start of interval i $y_{ij}=0,\ j$ not at risk start of interval i
c_{ij} is censoring indicator	$c_{ij}=0,\ j$ was not censored in interval i $c_{ij}=1$, j was censored in interval i	$c_{ij}=0,\ j$ was not censored in inter. i $c_{ij}=1$, j was censored in interval i
Expected Cond. prob. of surviving interval i for patient j	$p*_{ij}$	$p*_{ij}$
Expected Hazard dying interval i for patient j	$\lambda^*_{ij}=-\log(p*_{ij})$	$\lambda^*_{ij}=-\log(p*_{ij})$
Cum. prob. of surviving up to interval i	$S*_{ij}=p*_{1j}\ p*_{2j}\ldots p*_{i-1,j}\ p*_{ij}$	$S*_{ij}=p*_{1j}\ p*_{2j}\ldots p*_{i-1,j}\left(p*_{ij}\right)^{1/2}$ $=\exp\left\{\sum_{k=1}^{i-1}-\log\left(p*_{kj}\right)\right\}\sqrt{p*_{ij}}$ At the mid-point of the interval i
Pohar Perme weight	$w_{ij}=\dfrac{1}{S*_{ij}}$	$w_{ij}=\dfrac{1}{S*_{ij}}$

Variables	**"Kaplan-Meier" (Stata-stns) life table approximation of for interval grouped data**	**Actuarial 1 (Stata –strs-)**
1.Alive at start	$y_i = \sum_{j=1}^{N} y_{ij}$	$y_i = \sum_{j=1}^{N} y_{ij}$
2.Lost	$\sum_{j=1}^{N} c_{ij}$	$\sum_{j=1}^{N} c_{ij}$
3.Interval number of deaths (Died)	$d_i = \sum_{j=1}^{N} d_{ij}$	$d_i = \sum_{j=1}^{n} d_{ij}$
5.Interval W Observed Hazard of Death	$\Lambda_i^w = \frac{\sum_{j=1}^{N} d_{ij}\, w_{ij}}{\sum_{j=1}^{N} w_{ij}\,(y_{ij} - \frac{c_{ij}}{2})}$	
Interval W Observed probability of Death		$q_i^w = \frac{\sum_{j=1}^{N} d_{ij} w_{ij}}{\sum_{j=1}^{N} w_{ij}(y_{ij} - \frac{c_{ij}}{2})}$
6. Interval W Expected Hazard of Death	$\Lambda_i^{*w} = \frac{\sum_{j=1}^{N} \lambda_{ij}^{*}\, w_{ij}\,(y_{ij} - \frac{c_{ij}}{2})}{\sum_{j=1}^{N} w_{ij}\,(y_{ij} - \frac{c_{ij}}{2})}$	$\Lambda_i^{*wA} = \frac{\sum_{j=1}^{N} \lambda_{ij}^{*}\, w_{ij}(y_{ij} - \frac{c_{ij}}{2} - \frac{d_{ij}}{2})}{\sum_{j=1}^{N} w_{ij}\,(y_{ij} - \frac{c_{ij}}{2} - \frac{d_{ij}}{2})}$
Interval Net Hazard of Cancer Death	$d\Lambda_i^{Net} = \Lambda_i^w - \Lambda_i^{*w}$	
Interval Net Survival	$NS_i^w = 1 - d\Lambda_i^{Net}$	$NS_i^{wA} = \frac{1 - q_i^w}{\exp(-\Lambda_i^{*wA})}$
Interval W Observed Surv	$OS_i^w = 1 - \Lambda_i^w$	$OS_i^w = 1 - q_i^w$
Interval W Expected Surv	$ES_i^w = 1 - \Lambda_i^{*w}$	$ES_i^w = \exp\left\{-\Lambda_i^{*wA}\right\}$
Cumulative W Observed Surv	$OS^w(t) = \prod_{i=1}^{t} OS_i^w$	$OS^w(t) = \prod_{i=1}^{t} OS_i^w$

Variables	"Kaplan-Meier" (Stata-stns) life table approximation of for interval grouped data	Actuarial 1 (Stata –strs-)
Cumulative <u>W Expected Surv</u>	$ES^w(t) = \prod_{i=1}^{t} ES_i^w$	$ES^w(t) = \prod_{i=1}^{t} ES_i^w$
Cumulative <u>Net Survival</u>	$NS(t) = \prod_{i=1}^{t} NS_i^w$	$NS(t) = \prod_{i=1}^{t} NS_i^{wA}$
Variance Interval W <u>Obs prob</u> of Death		$Var(q_i^w) = \dfrac{\sum_{j=1}^{N} d_{ij}\ w_{ij}^{\ 2}}{\left\{\sum_{j=1}^{N} w_{ij}\ (y_{ij} - \frac{c_{ij}}{2} - \frac{d_{ij}}{2})\right\}^2}$
Variance Interval W Observed Hazard of Death	$Var(\Lambda_i^w) = \dfrac{\sum_{j=1}^{N} d_{i\,j}\ (w_{i\,j})^2}{\left(\sum_{j=1}^{N} w_{i\,j}\ (y_{i\,j} - \frac{c_{i\,j}}{2})\right)^2}$	
Variance Int. W Observed Survival		
Variance Cumulative W Observed Survival		
Variance Int. Net Survival	$Var(NS_i^w) = \left[NS_i^w\right]^2 Var(\Lambda_i^w)$	$Var(NS_i^w) = \left[NS_i^w\right]^2 Var(q_i^w)$
Variance Cum. Net Survival	$Var(NS(t)) = \left[NS(t)\right]^2 \sum_{i=1}^{t} Var(\Lambda_i^w)$	$Var(NS(t)) = \left[NS(t)\right]^2 \sum_{i=1}^{t} Var(q_i^w)$