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**gestim3\_interv.ado -- Source Code (version 1.5.0)**

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----- START OF PROGRAM -----

```
program gestim3_interv
version 12.0
clear ado
set more off
```

```
**// Grid search for psi1 and psi2
local mintest=10^10
local inc=0.01
qui {
forvalues psi1=-2(`inc')2 {
    forvalues psi2=-2(`inc')2 {
        gen U=s0+s1*exp(`psi1')+s2*exp(`psi2')+s12*exp(`psi1'+`psi2')
        egen alpha=min(U/T)
        gen C=censor
        replace C=alpha*censor if alpha<1
        gen X=min(C, U)
        gen delta=1 if U<C
        replace delta=0 if delta==.
        gen start=0
        gen end=X
        stset end, id(i) failure(delta)
        sts test R
        if r(chi2)<`mintest' {
            local m01=`psi1'
            local m02=`psi2'
            local mintest=r(chi2)
        }
        drop U alpha C X delta start end _*
    }
}
}
```

```
**// Approximate confidence interval for psi1
local m11=10^10
local m12=-(10^10)
local marker=0
di as result "psi1" _col (20) "chi2"
forvalues psi1=-2(`inc')2 {
    qui {
        gen U=s0+s1*exp(`psi1')+s2*exp(`m02')+s12*exp(`psi1'+`m02')
        egen alpha=min(U/T)
        gen C=censor
        replace C=alpha*censor if alpha<1
        gen X=min(C, U)
        gen delta=1 if U<C
        replace delta=0 if delta==.
        gen start=0
        gen end=X
        stset end, id(i) failure(delta)
        sts test R
    }
}
```

```

    if r(chi2)<(1.96^2) & `m11'>=(1.96^2) & `marker'==0 {
        local psillo=`psi1'
        local marker=1
    }
    if r(chi2)>(1.96^2) & `m12'<=(1.96^2) {
        local psilhi=`psi1'-'inc'
    }
    local m11=r(chi2)
    local m12=r(chi2)
    drop U alpha C X delta start end _*
}
di as result "`psi1'" _col(20) "`m11'"
}

**// Approximate confidence interval for psi2
local m21=10^10
local m22=-(10^10)
local marker=0
di as result "psi2" _col (20) "chi2"
forvalues psi2=-2(`inc')2 {
    qui {
        gen U=s0+s1*exp(`m01')+s2*exp(`psi2')+s12*exp(`m01'+`psi2')
        egen alpha=min(U/T)
        gen C=censor
        replace C=alpha*censor if alpha<1
        gen X=min(C, U)
        gen delta=1 if U<C
        replace delta=0 if delta==.
        gen start=0
        gen end=X
        stset end, id(i) failure(delta)
        sts test R
        if r(chi2)<(1.96^2) & `m21'>=(1.96^2) & `marker'==0 {
            local psi2lo=`psi2'
            local marker=1
        }
        if r(chi2)>(1.96^2) & `m22'<=(1.96^2) {
            local psi2hi=`psi2'-'inc'
        }
        local m21=r(chi2)
        local m22=r(chi2)
        drop U alpha C X delta start end _*
    }
    di as result "`psi2'" _col(20) "`m21'"
}

**// Fit Weibull distribution to transformed data (U)
qui {
    gen U=s0+s1*exp(`m01')+s2*exp(`m02')+s12*exp(`m01'+`m02')
    gen C=censor
    egen alpha=min(U/T)
    replace C=censor*alpha if alpha<0
    gen X=min(C, U)
    gen delta=1 if U<C
    recode delta .=0
    stset X, id(i) failure(delta)
    streg, dist(weibull) nolog nohr
    scalar theta=exp([ln_p]_b[_cons])
    drop U C X delta _*
}

```

```
}
```

```
**// Hazard ratio conversions
local hr1=int(100*exp(theta*`m01')+0.5)/100
local hr1lo=int(100*exp(theta*`psillo')+0.5)/100
local hr1hi=int(100*exp(theta*`psilhi')+0.5)/100
local m01=int(1000*`m01'+0.5)/1000
local psillo=int(1000*`psillo'+0.5)/1000
local psilhi=int(1000*`psilhi'+0.5)/1000
local hr2=int(100*exp(theta*`m02')+0.5)/100
local hr2lo=int(100*exp(theta*`psi2lo')+0.5)/100
local hr2hi=int(100*exp(theta*`psi2hi')+0.5)/100
local m02=int(1000*`m02'+0.5)/1000
local psi2lo=int(1000*`psi2lo'+0.5)/1000
local psi2hi=int(1000*`psi2hi'+0.5)/1000
```

```
**// Display results
di as result "Estimate of Psi1 = `m01' (`psillo', `psilhi')"
di as result "HR1 = `hr1' (`hr1lo', `hr1hi')"
di as result "Estimate of Psi2 = `m02' (`psi2lo', `psi2hi')"
di as result "HR2 = `hr2' (`hr2lo', `hr2hi')"
```

```
end
```

```
----- END OF PROGRAM -----
```