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PROGRAM TO CORRECT ESTIMATES FOR OVERDISPERSION AFTER USING
XTPOISSON, FE

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capture program drop xtpoisson_addOD

program def xtpoisson_addOD, eclass

dis _n(1) "Estimate and standard errors corrected for over-
dispersion"

tempvar ppred nonmissxY stratumsumY stratumsumpred pred x2

qui predict `ppred', nu0 // GIVES PRED COUNT WITHOUT STRATUM
EFFECT

local Y `e(depvar) '

local i `e(ivar) ' // STRATUM INDEX VARIABLE

local dfres=e(N)-e(df_m)-e(N_g) // DF OF THE RESIDUALS

qui gen `nonmissxY'=`Y'*(`ppred'!=.)

qui egen `stratumsumY'=sum(`nonmissxY'), by(`i')

qui egen `stratumsumpred'=sum(`ppred'), by(`i')

qui gen `pred'=`ppred'*`stratumsumY'/`stratumsumpred' // RESCALES
PRED COUNTS TO MATCH STRATUM SUMS

qui gen `x2'=(`Y'-`pred')^2/(`pred')

qui summ `x2'

local dispers=r(sum)/`dfres'

dis "df: `dfres' ; pearson x2:" %8.1f r(sum) " ; dispersion: " %8.2f
`dispers'

matrix B=get(_b)

matrix V=get(VCE)

matrix corrV=V*`dispers'

ereturn scalar dispers=`dispers'

ereturn post B corrV

ereturn display

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*STORE PREDICTED COUNTS AND PEARSON RESIDUALS
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capture drop _xtp_pred_count
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qui gen _xtp_pred_count = `pred'
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```
capture drop _xtp_pearsonres
```

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qui gen _xtp_pearsonres= (`x2'^.5)*sign(`Y'-`pred')
```

```
capture drop _xtp_devianceres
```

```
qui gen _xtp_devianceres= sqrt( 2*(`Y'*log(`Y'/`pred')-( `Y'-`pred')  
) *sign(`Y'-`pred')
```

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end
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*****PROGRAM TO RUN CRIME OUTCOME MODELS  
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gen offset=log(daysinmonth)
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xtset MSOA_code timevar
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```
foreach crimcat of varlist all4 burglary vehicle violence robbery {
```

```
xi: xtpoisson `crimcat' proppdim propwhite proppnl propSO i.timevar,  
fe iter(100) offset(offset)
```

```
xtpoisson_addOD
```

```
capture drop reslag*
```

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forvalues lag=1/3 {
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```
gen reslag`lag'=_xtp_pearsonres[_n-`lag'] if  
newid==newid[_n-`lag'] }
```

```
xi: xtpoisson `crimcat' proppdim propwhite proppnl propSO i.timevar  
reslag* , fe iter(100) offset(offset)
```

```
xtpoisson_addOD
```