New in Stata 16

NEW IN BAYESIAN ANALYSIS:
Multiple chains, predictions, & more

- Multiple chains
- Gelman–Rubin convergence diagnostics
- Bayesian predictions
- Posterior summaries of simulated values
- MCMC replicates
- Posterior predictive p-values

Multiple chains

Use new option nchains() with bayes: or bayesmh to simulate multiple chains.

Fit regression of $y$ on covariates $x_1$ through $x_{10}$ and generate 3 chains

Check Gelman–Rubin convergence diagnostics

Explore convergence visually for coefficient of $x_6$
Bayesian predictions

- Predict new values
- Check model fit using posterior predictive checks
- Compute functions of predicted values
- Specify your own prediction functions
- Obtain posterior summaries of predicted values
- Generate MCMC replicates
- Compute posterior predictive $p$-values

Bayesian predictions are outcome values simulated from the posterior predictive distribution. They are useful for predicting new outcome values and for checking model fit. Let’s use `bayesmh` to fit a general Bayesian model:

```
. bayesmh y ..., likelihood(...) prior(...)  
```

### Posterior summaries of predictions

Compute posterior mean and credible intervals for all observations, and store them in variables `pmean`, `cril`, and `criu`.

```
. bayespredict pmean, mean
. bayespredict cril criu, cri
```

### MCMC replicates

Compute 6 MCMC replicates, and store them in variables `yrep1`, `yrep2`, and so on.

```
. bayesreps yrep*, nreps(6)
```

### Posterior predictive $p$-values

Simulate predictions for outcome $y$, and save them in `y_pred.dta`.

```
. bayespredict {_ysim}, saving(y_pred)
```

### Perform analyses using GUI

Simulate predictions for outcome $y$, and save them in `y_pred.dta`.

```
. bayespredict {_ysim}, saving(y_pred)
```

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