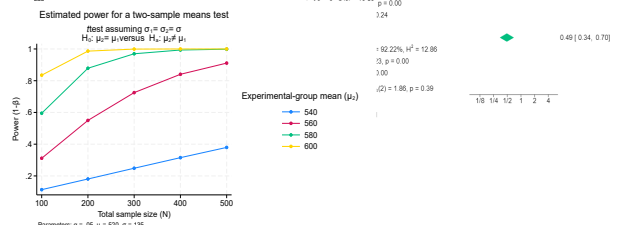
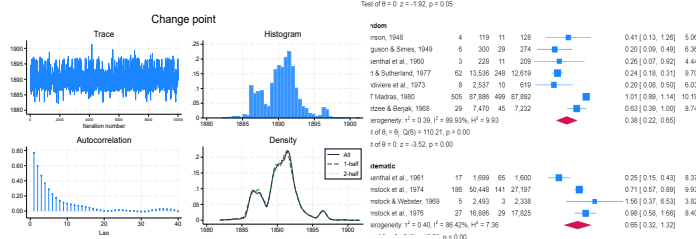
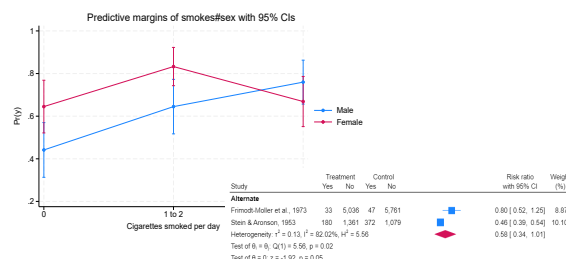


## PER L'EPIDEMIOLOGIA

Negli ultimi 30 anni, Stata è diventato uno dei principali software statistici utilizzati in ambito Sanità Pubblica. Stata offre ai ricercatori di epidemiologia una serie di comandi, funzioni e stimatori specializzati, tutti accessibili attraverso una serie di menu oppure tramite una sintassi flessibile. Stata 18 supporta un'ampia varietà di disegni di studio, offre una serie di strumenti di gestione dei dati specificamente progettati per la ricerca sanitaria nonché la possibilità di riprodurre facilmente le proprie analisi e di creare grafici di qualità editoriale, sia per le presentazioni sia per la creazione di rapporti periodici.

### CARATTERISTICHE:

- ADDITIVE MODELS OF RELATIVE RISK
- ADJUSTED PREDICTIONS, CONTRASTS, AND INTERACTIONS
- AUTOMATED REPORTING AND CUSTOMIZABLE TABLES
- BAYESIAN ANALYSIS
- CAUSAL INFERENCE
- EPIDEMIOLOGICAL TABLES
- IRT (ITEM RESPONSE THEORY)
- JUPYTER NOTEBOOK WITH STATA
- LINEAR, BINARY, AND COUNT REGRESSIONS
- MARGINAL MEANS, CONTRASTS, AND INTERACTIONS
- META-ANALYSIS
- MULTILEVEL MIXED-EFFECTS MODELS
- MULTIPLE IMPUTATION
- PANEL DATA
- POWER, PRECISION, AND SAMPLE SIZE
- STRUCTURAL EQUATION MODELING (SEM)
- SURVEY METHODS
- SURVIVAL ANALYSIS
- TIME SERIES



## ADDITIVE MODELS OF RELATIVE RISK

Determine how exposures interact to put subjects at a higher risk of experiencing an outcome of interest. For example, you might be investigating how exposure to cigarette smoke and asbestos interact to increase the risk of lung cancer. With Stata's **reri** command, you can measure two-way interactions in an additive model of relative risk, while accounting for other risk factors. Choose from various supported models, such as binomial generalized linear, Poisson, negative binomial, logistic, Cox, parametric survival, and interval-censored parametric and semiparametric survival models. Estimate the relative excess risk due to interaction (RERI), attributable proportion (AP), and synergy index (SI).

## ADJUSTED PREDICTIONS, CONTRASTS, AND INTERACTIONS

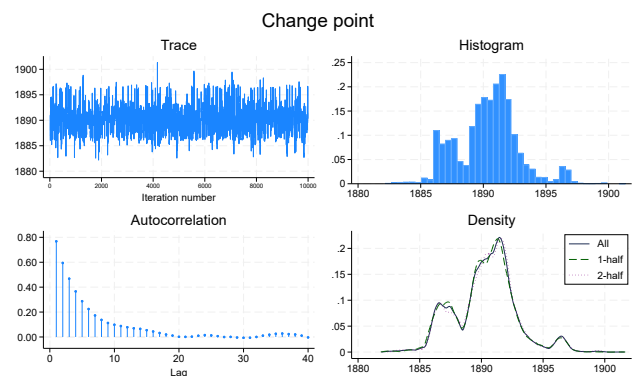
Adjusted predictions and contrasts let you analyse the relationships between your outcome variable and your covariates, even when that outcome is binary, count, ordinal, or categorical. Compute adjusted predictions with covariates set to interesting or representative values or compute marginal means for each level of a categorical covariate. Make comparisons of the adjusted predictions or marginal means using contrasts. If you have multilevel or panel data and random effects, these effects are automatically integrated out to provide marginal (that is, population-averaged) estimates. After fitting almost any model in Stata, analyse the effect of covariate interactions, and easily create plots to visualize those interactions.

## AUTOMATED REPORTING AND CUSTOMIZABLE TABLES

Stata is designed for reproducible research, including the ability to create dynamic documents incorporating your analysis results. Create Word or PDF files, populate Excel worksheets with results and format them to your liking, and mix Markdown, HTML, Stata results, and Stata graphs, all from within Stata. Create tables that compare **regression results** or **summary statistics**, use default styles or apply your own, and export your tables to Word, PDF, HTML, LaTeX, Excel, or Markdown and include them in your reports.

## BAYESIAN ANALYSIS

Fit Bayesian regression models using one of the Markov chain Monte Carlo (MCMC) methods. You can choose from various supported models or even program your own. Extensive tools are available to check convergence, including multiple chains. Compute posterior mean estimates and credible intervals for model parameters and functions of model parameters. You can perform both interval- and model-based hypothesis testing. Compare models using Bayes factors. Compute model fit using posterior predictive values and generate predictions. If you want to account for model uncertainty in your regression model, use **Bayesian model averaging**.



## CAUSAL INFERENCE

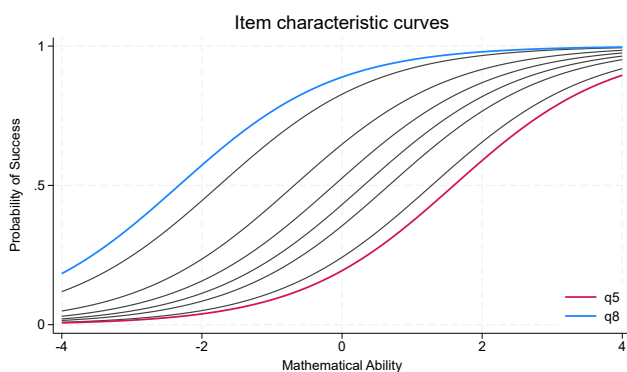
Estimate experimental-style causal effects from observational data. With Stata's treatment-effects estimators, you can use a potential-outcomes (counterfactuals) framework to estimate, for instance, the effect of family structure on child development or the effect of unemployment on anxiety. Fit models for continuous, binary, count, fractional, and survival outcomes with binary or multivalued treatments using inverse-probability weighting (IPW), propensity-score matching, nearest-neighbor matching, regression adjustment, or doubly robust estimators. If the assignment to a treatment is not independent of the outcome, you can use an endogenous treatment-effects estimator. In the presence of group and time effects, you can use difference-in-differences (DID) and triple-differences (DDD) estimators. In the presence of high-dimensional covariates, you can use lasso. If causal effects are mediated through another variable, use causal mediation with **mediate** to disentangle direct and indirect effects.

## EPIDEMIOLOGICAL TABLES

Do you need to analyse data from a prospective (cohort study, case-control study, or matched case-control study)? Stata's tables for epidemiologists make it easy to summarize your data and compute statistics such as incidence-rate ratios, incidence-rate differences, risk ratios, risk differences, odds ratios, and attributable fractions. You can analyse stratified data too—compute Mantel-Haenszel combined estimates, perform tests of homogeneity, and standardize estimates. If you have an ordinal rather than binary exposure, you can perform a test for a trend.

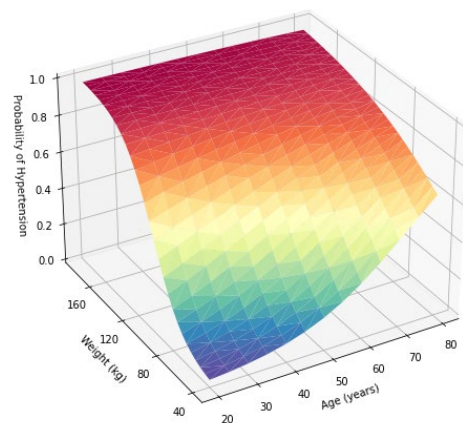
## IRT (ITEM RESPONSE THEORY)

Explore the relationship between unobserved latent characteristics such as hospital satisfaction and the probability of responding positively to questionnaire items related to satisfaction or explore the relationship between unobserved health and self-reported responses to questions about mobility, independence, and other health-affected activities. IRT can be used to create measures of such unobserved traits or place individuals on a scale measuring the trait. It can also be used to select the best items for measuring a latent trait. IRT models are available for binary, graded, rated, partial-credit, and nominal response items. Visualize the relationships using item characteristic curves, and measure overall test performance using test information functions.



## JUPYTER NOTEBOOK WITH STATA

Jupyter Notebook is widely used by researchers and scientists to share their ideas and results for collaboration and innovation. It is an easy-to-use web application that allows you to combine code, visualizations, mathematical formulas, narrative text, and other rich media in a single document (a "notebook") for interactive computing and developing. You can invoke Stata and Mata from Jupyter Notebook with the IPython (interactive Python) kernel. This means you can combine the capabilities of both Python and Stata in a single environment to make your work easily reproducible and shareable with others.

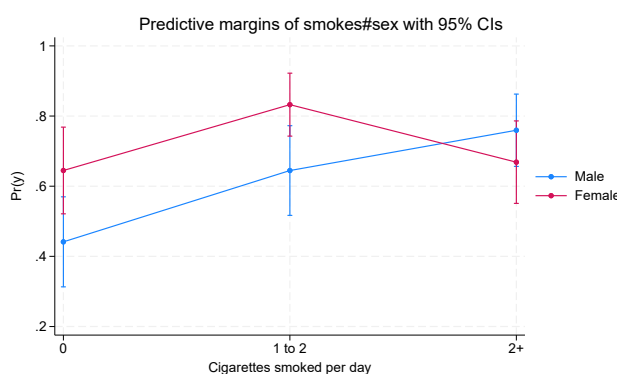


## LINEAR, BINARY, AND COUNT REGRESSIONS

Fit classical ANOVA and linear regression models of the relationship between a continuous outcome, such as weight, and the determinants of weight, such as height, diet, and level of exercise. If your response is binary, ordinal, categorical, or count, Stata has estimators for these types of outcomes too. Use logistic regression to adjust odds ratios for confounding variables. Estimate incidence rates using a Poisson model. Analyse matched case-control data with conditional logistic regression. A vast array of tools is available after fitting such models. Predict outcomes and their confidence intervals. Test equality of parameters. Compute linear and nonlinear combinations of parameters.

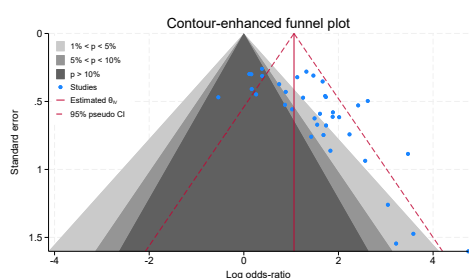
## MARGINAL MEANS, CONTRASTS, AND INTERACTIONS

Marginal means and contrasts let you analyse the relationships between your outcome variable and your predictors, even when your outcome is binary, count, ordinal, or categorical. For instance, after you fit a logistic regression of a disease on an exposure variable and other covariates, your marginal means may be population-averaged risks. You can also set the covariates to interesting values to compute adjusted risks and then use contrasts to get adjusted risk differences. After fitting almost any model in Stata, you can analyse the effect of covariate interactions and easily create plots to visualize those interactions.



## META-ANALYSIS

Combine results of multiple studies to estimate an overall effect. Use forest plots to visualize results. Use subgroup analysis and meta-regression to explore study heterogeneity. Use funnel plots and formal tests to explore publication bias and small-study effects. Use trim-and-fill analysis to assess the impact of publication bias on results. Perform cumulative and leave-one-out meta-analysis. Perform univariate, multilevel, and multivariate meta-analysis. Use the **meta** suite, or let the Control Panel interface guide you through your entire meta-analysis.

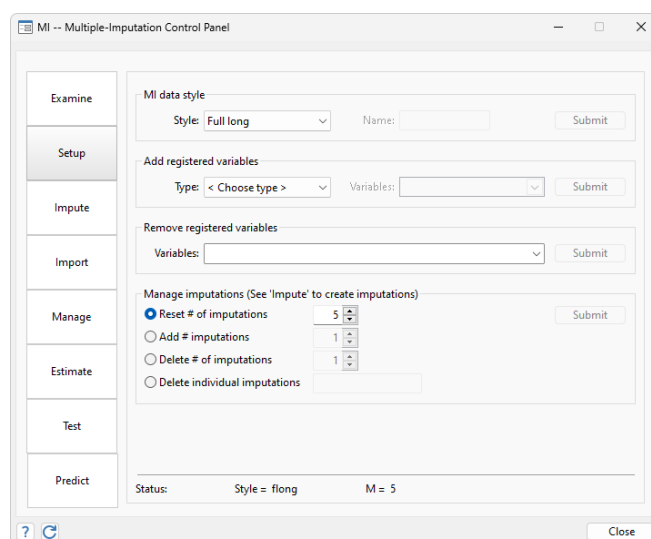


## MULTILEVEL MIXED-EFFECTS MODELS

Whether the groupings in your data arise in a nested fashion (patients nested in clinics and clinics nested in regions) or in a nonnested fashion (regions crossed with occupations), you can fit a multilevel model to account for the lack of independence within these groups. Fit models for continuous, binary, count, ordinal, and survival outcomes. Estimate variances of random intercepts and random coefficients. Compute intraclass correlations. Predict random effects. Estimate relationships that are population averaged over the random effects.

## MULTIPLE IMPUTATION

Account for missing data in your sample using multiple imputation. Choose from univariate and multivariate methods to impute missing values in continuous, censored, truncated, binary, ordinal, categorical, and count variables. Then, in a single step, estimate parameters using the imputed datasets, and combine results. Fit a linear model, logit model, Poisson model, hierarchical model, survival model, or one of the many other supported models. Use the **mi** command, or let the Control Panel interface guide you through your entire MI analysis.

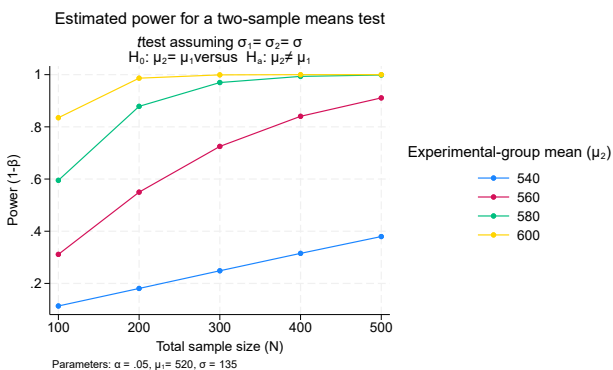


## PANEL DATA

Take full advantage of the extra information that panel data provide while simultaneously handling the peculiarities of panel data. Study the time-invariant features within each panel, the relationships across panels, and how outcomes of interest change over time. Fit linear models or nonlinear models for binary, count, ordinal, censored, or survival outcomes with fixed-effects, random-effects, or population-averaged estimators. Fit dynamic models or models with endogeneity. Fit **Bayesian panel-data models**.

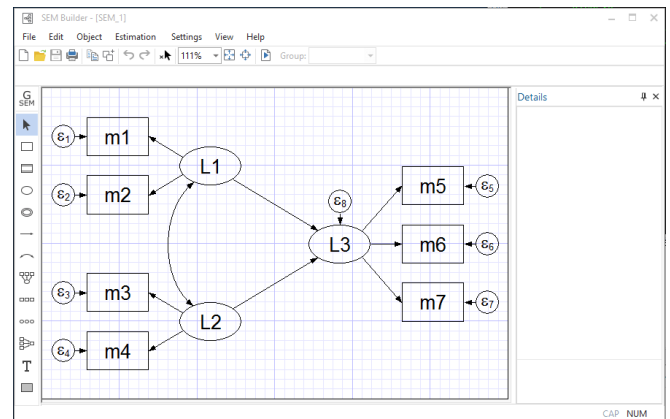
## POWER, PRECISION, AND SAMPLE SIZE

Before you conduct your experiment, determine the sample size needed to detect meaningful effects without wasting resources. Do you intend to compute CIs for means or variances or perform tests for proportions or correlations? Do you plan to fit a Cox proportional hazards model or compare survivor functions using a log-rank test? Do you want to use a Cochran–Mantel–Haenszel test of association or a Cochran–Armitage trend test? Use Stata's **power** command to compute power and sample size, create customized tables, and automatically graph the relationships between power, sample size, and effect size for your planned study. Or use the **ciwidth** command to do the same but for CIs instead of hypothesis tests by computing the required sample size for the desired CI precision. Or use **gsdesign** to compute stopping boundaries and the required sample sizes for group sequential designs. Instead of commands, use the interactive Control Panel to perform your analysis.



## STRUCTURAL EQUATION MODELING (SEM)

Estimate mediation effects, analyze the relationship between an unobserved latent concept such as depression and the observed variables that measure depression, model a system with many endogenous variables and correlated errors, or fit a model with complex relationships among both latent and observed variables. Fit models with continuous, binary, count, ordinal, fractional, and survival outcomes. Stata even allow you to fit multilevel models with groups of correlated observations such as children within the same schools. Evaluate model fit. Compute indirect and total effects. Fit models by drawing a path diagram or using the straightforward command syntax.



## SURVEY METHODS

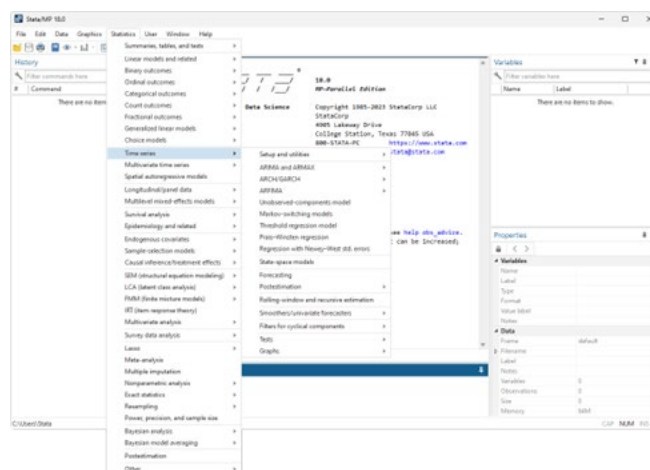
Whether your data require a simple weighted adjustment because of differential sampling rates or you have data from a complex multistage survey, Stata's survey features can provide you with correct standard errors and confidence intervals for your inferences. Simply specify the relevant characteristics of your sampling design, such as sampling weights (including weights at multiple stages), clustering (at one, two, or more stages), stratification, and poststratification. After that, most of Stata's estimation commands can adjust their estimates to correct for your sampling design.

## SURVIVAL ANALYSIS

Analyse duration outcomes—outcomes measuring the time to an event such as failure or death—using Stata's specialized tools for survival analysis. Account for the complications inherent in survival data, such as sometimes not observing the event (right-, left-, and interval-censoring), individuals entering the study at differing times (delayed entry), and individuals who are not continuously observed throughout the study (gaps). You can estimate and plot the probability of survival over time or model survival as a function of covariates using Cox, Weibull, lognormal, and other regression models. Predict hazard ratios, mean survival time, and survival probabilities. Do you have groups of individuals in your study? Adjust for within-group correlation with a random-effects or shared-frailty model. If you have many potential covariates, use **lasso cox** and **elasticnet cox** for model selection and prediction.

## TIME SERIES

Handle the statistical challenges inherent to time-series data—autocorrelations, common factors, autoregressive conditional heteroskedasticity, unit roots, cointegration, and much more. Analyze univariate time series using ARIMA, ARFIMA, Markov-switching models, ARCH and GARCH models, and unobserved-components models. Analyze multivariate time series using VAR, structural VAR, VEC, multivariate GARCH, dynamic-factor models, and state-space models. Compute and graph impulse responses. Test for unit roots. Perform **Bayesian time-series analysis**.



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