

Planned syllabus

The chapter references are to Lohr's book. For some topics there will be additional references. It is quite possible that we will end up going more slowly than this syllabus indicates and some later topics may have to be omitted. If I can get a large enough room, the poster presentations may all be on one day.

1. Overview. Examples. Random sampling. Population vs superpopulation inference. *Ch 1*
2. Introduction to computing (R, Stata). Simple random sampling: mean, variance, total, effect of population size. Sampling with replacement. *Ch 2*
3. Stratified random sampling. *Ch 4.1–3, 4.5, 4.8*
4. Unequal probability sampling (with replacement): the Horvitz–Thompson estimator, Basu's paradox. *Ch 6.1, 6.2.2, 6.2.3, 6.5*
5. Ratio estimation, Domain estimation, quantiles. *Ch 3, 7.3, 9.5*
6. Design: design effect, optimal design. *7.5, 4.4, 4.5,*
7. [MLKjr day]
8. Graphics *Ch 7.4*
9. Resampling: jackknife, bootstrap, BRR *Ch 9.3*
10. Cluster sampling: effect on precision and cost, estimating standard errors, as example of incom- plete sample frame. *Ch 5.1–5.5*
11. Post-stratification: gains in precision, estimated weights paradox. *Ch 4.7*
12. Raking (and relationship to ratio estimation) , reweighting for non-response *Ch 8.5*
13. Multistage sampling: with and without replacement. *Ch 7*
14. Linear regression models for survey data. *Ch 11.1–11.2*
15. Important national surveys: aims, design, data sources
16. Logistic regression *Ch 11.5*
17. Review
18. [Presidents' day]
19. Midterm exam

20. Use of weights in regression: pro and con. Case-control design. *11.3*
21. Calibration by least squares, generalized raking, comparison to estimating weights by logistic regression *Ch 11.6*
22. PPS sampling, variance of Horvitz–Thompson estimator in general case. *Ch 6*
23. Two-phase sampling: general form, two-phase designs in epidemiology *Ch 12.1*
24. Calibration to phase 1 in two-phase designs. Two-phase designs as a paradigm for missing data
25. Missing data. *Ch 8*
26. Sampling from imaginary populations: IPTW sampling for causal inference
27. Calibration to imaginary populations
28. Student poster presentations
29. Student poster presentations
30. Network sampling.