Probability Sampling Formula Sheet

Notes for SHS • Topic 81 • All data are fictional • November 2026

Sampling fraction and SRS inclusion

f=n/N=60/240=.25; under SRS without replacement pi_i=n/N.

Proportionate strata

n_h=n*N_h/N; A30,B18,C12; W_h=N_h/N.

Stratified estimated mean

Sum(W_h*xbar_h); actual generated estimate 71.466667.

Design weights

w_i=1/pi_i; equal proportional design weights 4,4,4; disproportionate 20/20/20 weights 6,3.6,2.4.

Systematic

k=N/n=4; random start 1..4; stipulated start3 selects 3,7,...,239.

SRS standard error

Estimated SE=sqrt((1-n/N)*s²/n); with separate illustrative s=12, SE=1.341641.

Finite population correction

sqrt(1-n/N)=sqrt(.75)=.866025 under corresponding approximation.

Sample-size planning

Initial proportion formula n0=z² p(1-p)/e² under a stated approximation; refine for finite population, design and nonresponse.

Design effect

Var(actual design estimator)/Var(reference SRS estimator); may be greater or less than one.