population: the entire group of individuals
Sample: the part of population that we actually collect information.
sampling design: how to choose a sample from the population

planning a sample servey:
1. what population we want to describe.
2. what we want to measure => give exact definitions of variables.

census: a servey that test the entire population.
advantage of Sample servey:
1. census is not feasible if the measurement destroy the unit being tested.
2. faster to collect a sample.
3 get the most accurate information.

Random Sampling: Random Sampling: use of chance to get a sample.
隨机數表
Simple Random Sample (SRS): picking numbes from table of random digit
inference: the process of drawing conclusion about a population on the basis of sample data

Benefit of random sampling:
1. eliminate bias
2. get trustworthy inference

Stratified Random Sampling: divide population into groups, simple random sample on each group.
Cluster Sampling: divide population into clusters and take a SRS of clusters and measure only the units of selected clusters.
Systematic Sampling: divide population list into consecutive segments, randomly choose a starting point in the first sagement, then sample at the same point in each sagement.
Multistage Sampling: Sampling plan that uses a combination of sampling methods in various stages.

Errors of sampling:
Under-coverage: some samples are left-out
Nonresponse: the individual chosen for the sample can't be contacted.
Response bias: in correct response.
Wording effect: have influence on the answer given to a sample survey.

Bad Sample:

convenience sample: taking the member of the population that are easise to reach

bias: ....

volunteer response: people can choose themselves by responding to general appeal