SAMPLING

Sampling:
Design and Procedures

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Chapter Outline

1) Umum
2) Sample or Census
3) The Sampling Design Process
   i. Populasi Sasaran
   ii. Kerangka Sampling
   iii. Memilih teknik Sampel
   iv. Menentukan besaran sampel
   v. Proses pemilihan sample

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Chapter Outline

4) Jenis Sampling
   i. Teknik Nonprobabiliti
      a. Convenience Sampling
      b. Judgmental Sampling
      c. Quota Sampling
      d. Snowball Sampling
   ii. Teknik Probabiliti
      a. Simple Random Sampling
      b. Systematic Sampling
      c. Stratified Sampling
      d. Cluster Sampling
      e. Other Probability Sampling Techniques

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Chapter Outline

5. Memilih Probabiliti atau Nonprobabiliti
6. Menggunakan probabiliti vs nonprobabiliti
7. Ringkasan
8. Konsep

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Sample vs. Census

Table 11.1

Type of Study	Conditions Favoring the Use of Sample	Census
1. Budget	Small	Large
2. Time available	Short	Long
3. Population size	Large	Small
4. Variance in the characteristic	Small	Large
5. Cost of sampling errors	Low	High
6. Cost of nonsampling errors	High	Low
7. Nature of measurement	Destructive	Nondestructive
8. Attention to individual cases	Yes	No

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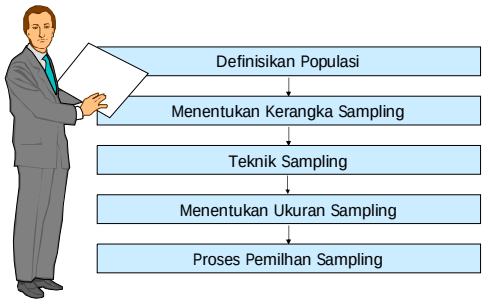
Proses Sampling

Fig. 11.1



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Mendefinisikan Populasi Sasaran

Populasi kumpulan objek yg memiliki informasi yang dibutuhkan oleh peneliti dimana peneliti akan menyimpulkan. Dalam kaitan ini ada berbagai terminologi terkait elements, sampling units, extent, and time.

- **Element:** adalah objek tentang dan daripadanya dipeoleh informasi, misalnya: responden.
- A **sampling unit** adalah element, or a unit yang bersiikan elemen, yang tersedia untuk dipilih melalui proses.
- **Extent:** menunjukkan batasan geografis
- **Time** adalah waktu yang harus dipertimbangkan dalam memilih

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Mendefinisikan Populasi Sasaran

Faktor **kualitatif** yang harus dipertimbangkan

1. Pentingnya keputusan
2. Sifat penelitian
3. Jumlah variabel
4. Sifat analisis
5. Besaran sampel pada penelitian yg sama
6. Tingkat kesalahan
7. Tingkat persiapan
8. Kendala sumberdaya

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Sample Sizes Used in Marketing Research Studies

Table 11.2

Type of Study	Minimum Size	Typical Range
Problem identification research (e.g. market potential)	500	1,000-2,500
Problem-solving research (e.g. pricing)	200	300-500
Product tests	200	300-500
Test marketing studies	200	300-500
TV, radio, or print advertising (per commercial or ad tested)	150	200-300
Test-market audits	10 stores	10-20 stores
Focus groups	2 groups	4-12 groups

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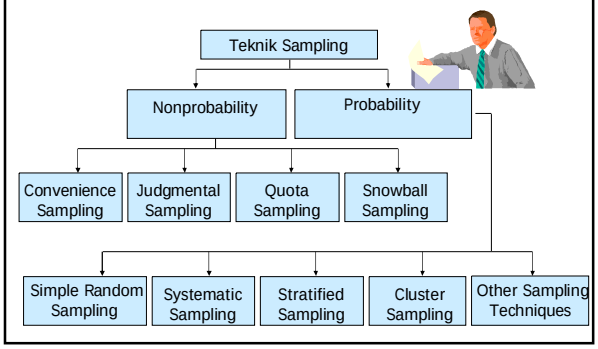
Classification of Sampling Techniques

Fig. 11.2



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Convenience Sampling

Convenience sampling. Dipilih peneliti karena didapat pada tempat dan waktu yg tepat

- Siswa dan angota organisasi
- Wawancara di mall
- Departemen store
- Wawancara terhadap “orang yg ditemukan di jalan”

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Judgmental Sampling

Judgmental sampling bentuk lain dari konvinien akan tetapi peneliti menggukankan pertimbangan ataupun kualifikasi lain.

- Uji pasar
- Pemebalian mesin dari industri maupun manufaktur
- Sampel pada pemberian suara
- Ekspert di Pengadilan

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Sampling Kuota

Quota sampling may be viewed as two-stage restricted judgmental sampling.

- Tahap pertama menentukan kategori pengendali dari unsur yg ada: Jenis kelamin misalnya.
- Tahap ke dua, sampel ditentukan atas dasar kategori tadi.

Control Characteristic	Population composition	Sample composition	
	Percentage	Percentage	Number
Sex			
Male	48	48	480
Female	52	52	520
	100	100	1000

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Snowball Sampling

In **snowball sampling**, sampel awal ditentukan secara random.

- Seelsai di interviu, sampel ini memberi tahu siapa lagi yg termasuk kepada populasi sasaran
- Responden berikut ditentukan atas dasar informasi dari responden terpilih sebelumnya.

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Simple Random Sampling

- **Seluruh populasi diketahui**, setiap anggota memiliki kesempatan untuk terpilih.
- Setiap anggota sampel (n) mempunyai **kesempatan yang sama** untuk terpilih.
- Ini menunjukkan bahwa setiap anggota dipilih secara **independen** dari keseluruhan sampel.

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Systematic Sampling

- Setiap sampel dipilih pada awalnya dg acak, kemudian sampel dipilih dari unsur
- Rentang sampling, i, ditentukan dg membagi N dg ukuransampel (n) dg pembulatan ke bilangan terdekat.
- Bila urusan unsur berkaitan dg karakteristik, maka sistimatik lebih mendekati keterwakilan sample.
- Bila urutan mengikuti siklus, maka sistimatik akammengurangi keterwakilan.

For example, there are 100,000 elements in the population and a sample of 1,000 is desired. In this case the sampling interval, i, is 100. A random number between 1 and 100 is selected. If, for example, this number is 23, the sample consists of elements 23, 123, 223, 323, 423, 523, and so on.

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Stratified Sampling

- Dua langkah pertama, sample dibagi menjadi dua sub (partisi) atau strata.
- Strata harus **mutually exclusive and collectively exhaustive** sehingga satu populasi hanya dimungkinkan dikelompokkan sekali ke dalam satu strata.
- Berikutnya, unsur dipilih dari masing-masing stratum dg cara SRS.
- Tujuan Utama SS adalah meningkatkan presisi tanpa menambah biaya.

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Stratified Sampling (Catatan)

- Unsur harus homogen, sementara strata yang dibuat harus hetrogen.
- Strateifikasi juga harus ada tujuannya, kebutuhan apa yg akan diperoleh dari stratifikasi.
- Variabel harus mengurangi biaya sampling.
- Proporsi strata, sampel yg terpilih harus proporsional.
- Bila strata tidak proporsional, maka sampel harus proporsional terhadap masing-masing strata.

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Cluster Sampling

- Sampel dibagi ke dalambentuk cluster memenuhi syarat mutually exclusive and collectively exhaustive subpopulations, or clusters.
- SRS diterapkan dari cluster.
- Sample mungkin dipilih secara one stage atau two stage.
- Unsur di kluster harus hetrogen, sementara unsur pada kluster harus homogen.
- Pada sampel yg proporsional, kluster proporisonal, akan tetapi pada pemilihan yang two stage, sampling berbeda dg

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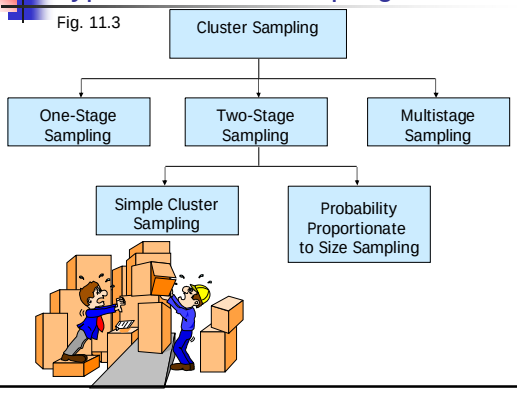
Types of Cluster Sampling

Fig. 11.3



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Strengths and Weaknesses of Basic Sampling Techniques

Table 11.3

Technique	Strengths	Weaknesses
Nonprobability Sampling		
Convenience sampling	Least expensive, least time-consuming, most convenient	Selection bias, sample not representative, not recommended for descriptive or causal research
Judgmental sampling	Low cost, convenient, not time-consuming	Does not allow generalization, subjective
Quota sampling	Sample can be controlled for certain characteristics	Selection bias, no assurance of representativeness
Snowball sampling	Can estimate rare characteristics	Time-consuming
Probability sampling		
Simple random sampling (SRS)	Easily understood, results projectable	Difficult to construct sampling frame, expensive, lower precision, no assurance of representativeness.
Systematic sampling	Can increase representativeness, easier to implement than SRS, sampling frame not necessary	Can decrease representativeness
Stratified sampling	Include all important subpopulations, precision	Difficult to select relevant stratification variables, not feasible to stratify on many variables, expensive
Cluster sampling	Easy to implement, cost effective	Imprecise, difficult to compute and interpret results

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Procedures for Drawing Probability Samples

Fig. 11.4

1. Pilih kerangka yang sesuai
2. Masing masing diberi nomor 1- N.
3. Pilin n (jumlah sampel) dari daftar 1-N.
4. Nomor yang terpilih (denote) harus dari kerangka sampel yang ada.

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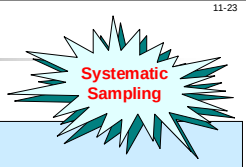
Procedures for Drawing Probability Samples

Fig. 11.4 cont.



1. Pilih Kerangka Sampling
2. Masing-masing sampel ditunjukkan 1- N
3. Tentukan interval sampling i:i=N/n. Bila i adalah pecahan, maka genapkan ke bilangan yang paling dekat.
4. Pilih bilangan acak, r, antara 1 dan i,
5. Lakukan pemilihan dg cara : r, r+i,r+2i,r+3i,r+4i,...,r+(n-1)i

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Procedures for Drawing Probability Samples

Fig. 11.4 cont.

1. Select a suitable frame
2. Select the stratification variable(s) and the number of strata, H
3. Divide the entire population into H strata. Based on the classification variable, each element of the population is assigned to one of the H strata
4. In each stratum, number the elements from 1 to N_h (the pop. size of stratum h)
5. Determine the sample size of each stratum, n_h, based on proportionate or disproportionate stratified sampling, where

$$\sum_{h=1}^{H} n_h = n$$

6. In each stratum, select a simple random sample of size n_h

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Procedures for Drawing Probability Samples

Fig. 11.4 cont.

Cluster Sampling

1. Assign a number from 1 to N to each element in the population
2. Divide the population into C clusters of which c will be included in the sample
3. Calculate the sampling interval i, i=N/c (round to nearest integer)
4. Select a random number r between 1 and i, as explained in simple random sampling
5. Identify elements with the following numbers: r,r+i,r+2i,... r+(c-1)i
6. Select the clusters that contain the identified elements
7. Select sampling units within each selected cluster based on SRS or systematic sampling
8. Remove clusters exceeding sampling interval i. Calculate new population size N*, number of clusters to be selected C*= C-1, and new sampling interval i*.

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Procedures for Drawing Probability Samples

Fig. 11.4 cont.

Cluster Sampling

Repeat the process until each of the remaining clusters has a population less than the sampling interval. If b clusters have been selected with certainty, select the remaining c-b clusters according to steps 1 through 7. The fraction of units to be sampled with certainty is the overall sampling fraction = n/N. Thus, for clusters selected with certainty, we would select $n_s=(n/N)(N_1+N_2+...+N_b)$ units. The units selected from clusters selected under PPS sampling will therefore be $n^*=n- n_s$.

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Choosing Nonprobability vs. Probability Sampling

Table 11.4 cont.

Factors	Kondisi yang mempengaruhi Nonprobability sampling	Probability sampling
Sifat Riset	Exploratory	Conclusive
Besaran Sampling error yg diharapkan.	Nonsampling errors are larger	Sampling errors are larger
Variasi Populasi	Homogeneous (low)	Heterogeneous (high)
Pertimbangan Statistik	Unfavorable	Favorable
Pertimbangan Operasional	Favorable	Unfavorable