

Random Samples

2) June 04

Number the sample e.g A0 B1 C2 D3 E4 F5 G6 H7 I8 J9

Pick one figure at a time

Sample from 0 7 9 8 3 is Ali, Hall, Jenks, Ip and Dost

2) Jan 05

(i) For example: Only those buying the newspaper get the opportunity to participate. Only those taking the effort to complete and return the questionnaire have their opinions considered. Those with strong feelings are the ones likely to respond.

(ii) Obtain a list of the adults in the area. Number them. Select people from the list using random numbers and contact them to seek their opinions.

3) Jan 02

(i) Only those people walking past will be asked to take part so not representative of all adults. It rules out e.g. those working on Saturday morning, those from the town who have chosen not to come into town on that morning etc.

(ii) Obtain the electoral register for the town, number the list of names, choose twenty numbers and random and contact those people to complete the questionnaire.

3) Jan 04

(i) Obtain a list of all pupils in the school. Number them from 001 to 200. Use numbers from the random number tables in groups of 3 (**ignoring those over 200**) to select corresponding pupils.

(ii) $X \sim B(8, \frac{120}{200}) = B(8, 0.6)$

$$P(X \geq 6) = 1 - P(X \leq 5) = 1 - 0.6846 = 0.315 \text{ (3 sf)}$$

$$\text{or } P(X \geq 6) = {}^8C_6 \left(\frac{3}{5}\right)^6 \left(\frac{2}{5}\right)^2 + {}^8C_7 \left(\frac{3}{5}\right)^7 \left(\frac{2}{5}\right) + \left(\frac{3}{5}\right)^8 = 0.315 \text{ (3 sf)}$$

1) Jan 03

(i) Obtain electoral register. Number those on the register. Choose 20 using random numbers.

(ii) (a) $X \sim \text{Bin}(20, 0.3)$

$$P(X \geq 9) = 1 - P(X \leq 8) = 1 - 0.8867 = 0.1133 = 0.113 \text{ (3 sf)}$$

(b) The sampling method was unbiased even though the sample has turned out to be biased as you would expect to get 6 people in social classes A and B.

3) June 02

(i) Houses with large gardens are more likely to be selected therefore all houses don't have an equal chance of being selected therefore a random sample will not be produced.

(ii) List houses, number the houses and use random numbers to select houses.

2) June 01

Obtain list of pupils; number pupils; select 60 using random numbers.

