

SESSION 13: DATA REPRESENTATION 1

Key Concepts

In this session we will focus on summarising what you need to know about:

- Introduction to data representation
- Organising the data
- Displaying data

X-planation

1. INTRODUCTION

Data handling refers to the process of collecting, organising, displaying and analysing data. Data refers to the numerical information gathered via various methods. Once the data has been analysed, conclusions need to be drawn and the initial questions need to be answered.

2. ORGANISING THE DATA

Once all the data has been collected it is very important to be able to organise it in a way that allows for easy analysis. A frequency table is a good way of organising data so that one can see how many of each data points there are. It helps you count (tally) the data and answer questions related to the number of data points. Highest and lowest frequencies are also easy to interpret.

3. DISPLAYING DATA

There are many different ways that the organised data can be displayed graphically. The way that data is displayed depends on the type of data that was collected.

For discrete data (data you can count, e.g. number of taxis on the road) the following can be used to display your data:

- Single bar graph
- Compound bar graph
- Pie chart

For continuous data (data you can measure, e.g. age, mass or height) the following can be used to display your data:

- Line graph
- Broken line graph
- Histogram

X-ample Questions

Question 1

Thando conducted a survey amongst learners at Kings High School using a survey questionnaire:

- a) By completing the survey slip below, show how Patience would complete the survey form. She is a 16 year old girl who was very ill, absent for more than a week, and hospitalised for H1N1 (swine) 'flu symptoms'. (3)

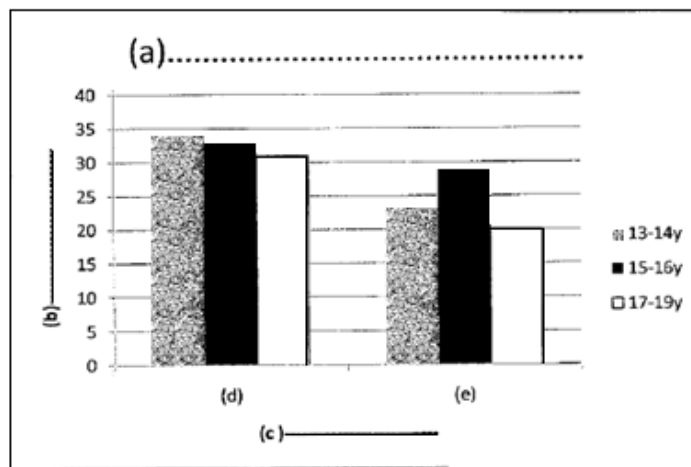
Influenza survey 2009			
Gender:	M	F	
Age:	<input type="checkbox"/> 13-14y	<input type="checkbox"/> 15-16y	<input type="checkbox"/> 17-19y
Did you get influenza during the winter term (Apr – Sept 2009)			
	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Was this confirmed as H1N1 (swine 'flu) or seasonal 'flu			
	<input type="checkbox"/> H1N1	<input type="checkbox"/> Seasonal 'Flu	
How sick were you?			
	<input type="checkbox"/> mildly ill	<input type="checkbox"/> very ill	<input type="checkbox"/> hospitalized
How many days were you absent from school?			
	<input type="checkbox"/> 1-2 days	<input type="checkbox"/> 3-4 days	<input type="checkbox"/> 5-7days <input type="checkbox"/> > 7days

- b) Thando has summarised her data from all the completed questionnaires in the table below. Use this summary and answer the questions which follow:

Results of Survey Questionnaire

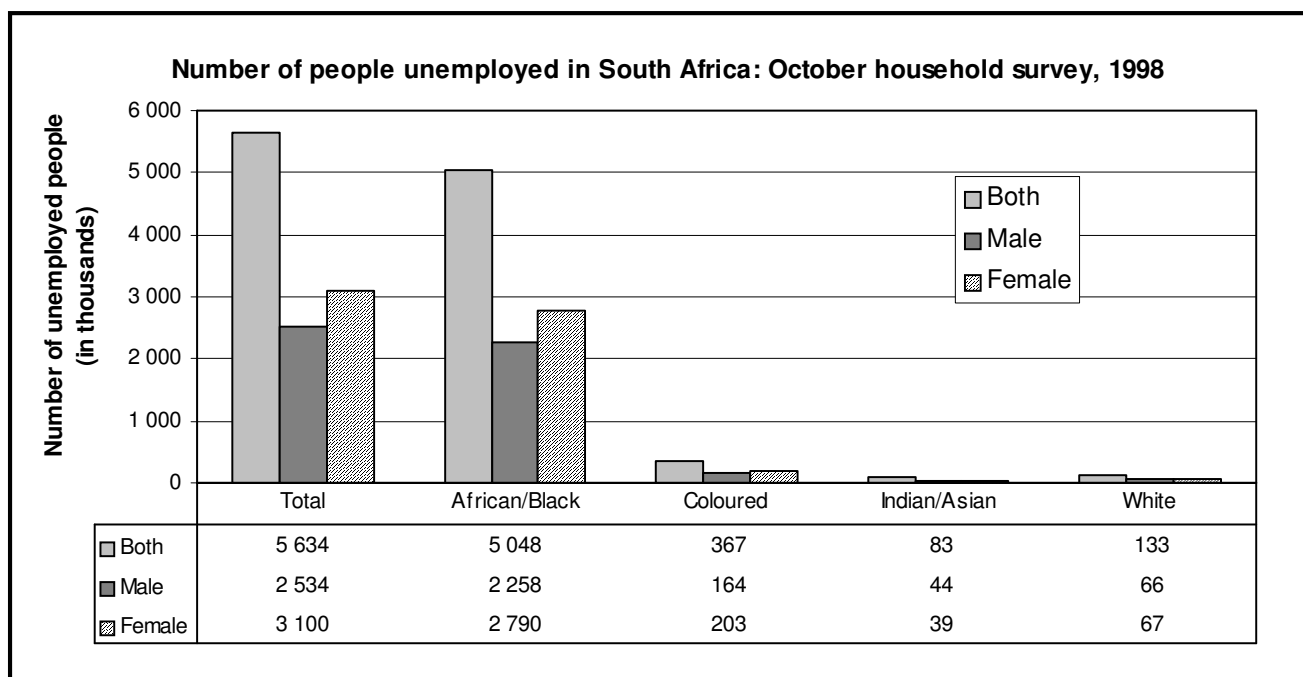
		Males			Females		
		13-14 y	15-16y	17-19y	13-14y	15-16y	17-19y
No flu		4	9	-	4	5	5
H1N1 flu	Absent 1-2d	2	1	2	3	1	1
	Absent 3-4d	1	3	2	1	2	3
	Absent 5-7d	1	4	3	6	7	5
	Absent >7 days	2	1	3	5	3	5
Seasonal flu	Absent 1-2d	6	7	6	8	7	6
	Absent 3-4d	4	2	1	4	3	3
	Absent 5-7d	2	1	2	3	3	1
	Absent >7 days	1	1	1	-	2	2
		23	29	20	34	33	31

- i) How many males and females of all ages participated in the survey? (2)
 - ii) What percentage of boys of all ages who got influenza, suffered from seasonal influenza? (2)
 - iii) Thando wrote in her report: “two-thirds of teenagers affected by H1N1 were absent for a period of more than 4 days”. Show how she came to this conclusion. (4)
 - iv) Were girls and boys equally affected by influenza H1N1? Using information from the table, explain your answer. (4)
- c) Thando illustrated her participants in the following graph: Complete her graph by giving the labels for (a) – (e). (5)



Question 2

Below are charts and tables of data from Statistics South Africa. They give the numbers of unemployed people in 1998 and the total population in South Africa for the years 1991 to 1999. In these tables, people are classified according to the previous racial classification.



**Population of South Africa: Total population, people classified as African/Black or Coloured
(Numbers of people in thousands)**

Mid-year	Total population			African/Black			Coloured		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
1991	36 199	17 241	18 958	27 400	12 986	14 414	3 254	1 567	1 687
1992	36 992	17 652	19 340	28 072	13 332	14 740	3 317	1 599	1 718
1993	37 802	18 072	19 730	28 760	13 688	15 072	3 381	1 632	1 749
1994	38 631	18 503	20 128	29 463	14 052	15 411	3 447	1 666	1 781
1995	39 478	18 944	20 534	30 184	14 426	15 758	3 514	1 700	1 814
1996	40 342	19 395	20 947	30 922	14 810	16 112	3 581	1 735	1 846
1997	41 227	19 857	21 370	31 677	15 203	16 474	3 651	1 771	1 880
1998	42 130	20 330	21 800	32 449	15 606	16 843	3 721	1 807	1 914
1999	43 054	20 814	22 240	33 240	16 019	17 221	3 792	1 844	1 948

Population of South Africa (continued): Total population, people classified as Indian/Asian, White or Unspecified/Other (Numbers of people in thousands)									
Mid-year	Indian/Asian			White			Unspecified/Other		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
1991	961	469	492	4 238	2 051	2 187	347	169	178
1992	976	477	499	4 275	2 072	2 203	352	172	180
1993	992	485	507	4 312	2 093	2 219	358	175	183
1994	1 008	493	515	4 349	2 114	2 235	363	178	185
1995	1 024	501	523	4 386	2 135	2 251	369	181	188
1996	1 041	510	531	4 425	2 157	2 268	374	184	190
1997	1 058	519	539	4 462	2 178	2 284	380	187	193
1998	1 075	527	548	4 500	2 200	2 300	385	190	195
1999	1 092	536	556	4 539	2 222	2 317	391	193	198

The table below shows estimates for the percentage of people who are unemployed for the different groups. The estimates are classified according to the previous racial classification and by gender.

Racial classification	% unemployed in 1998
Total population	13,37
Total: males	12,46
Total: females	14,22
African/Black – total	15,56
Male African/Black	14,47
Female African/Black	16,56
Coloured – total	9,86
Male Coloured	9,07
Female Coloured	10,61
Indian/Asian – total	7,72
Male Indian/Asian	8,35
Female Indian/Asian	7,12
White – total	2,95
Male White	3,00
Female White	2,91

- Draw a multiple bar chart that represents the data in the percentage table above. Let the vertical axis range from 0% to 20%. (9)
- Which section of the population had the highest unemployment rate in 1998? (2)
- Was the unemployment rate in general higher amongst males or females? Briefly explain your answer. (2)

- d) Were there more unemployed Indian/Asian people than unemployed White people in 1998? Explain your answer. (2)
- e) If the ratio of employed to unemployed people remained the same as it was in 1998, estimate how many unemployed people there were in South Africa in 2001 when the total population was 44,8 million. (2)

X-exercises

A school counsellor conducted a survey amongst a group of high school students using the following survey slip:

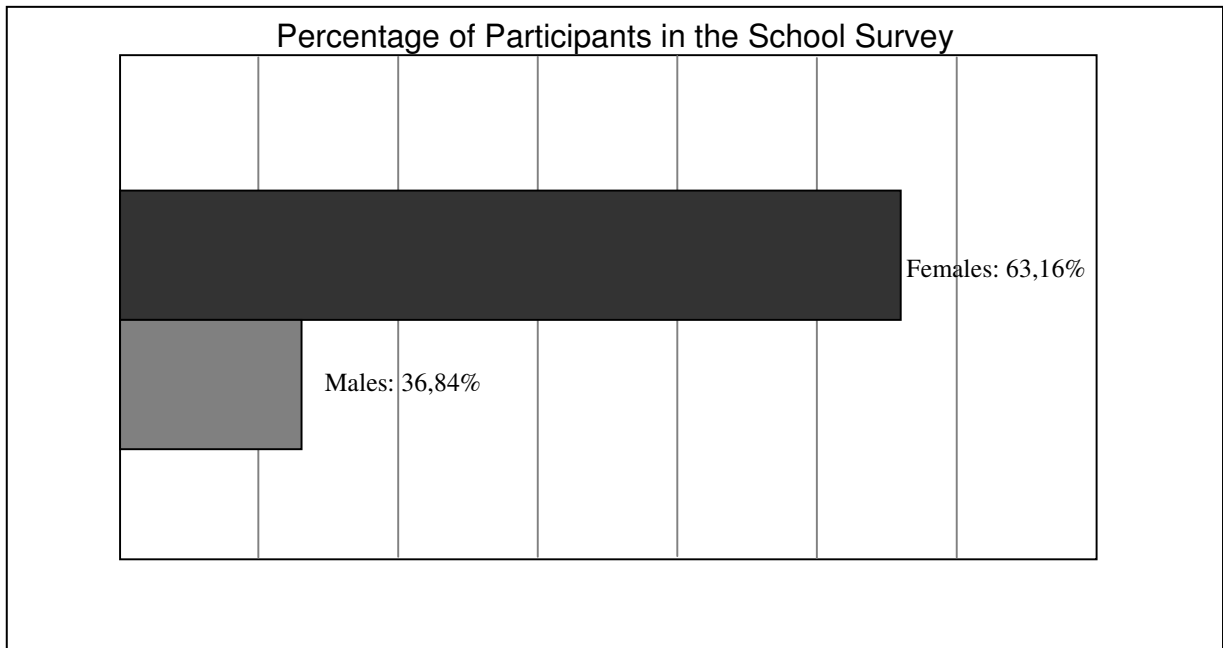
School Survey			
Answer by ticking the correct boxes.			
Sex: <input type="checkbox"/> Male		<input type="checkbox"/> Female	
Age: <input type="checkbox"/> 13 – 14	<input type="checkbox"/> 15 – 16	<input type="checkbox"/> 17 – 18	
Under how much pressure are you to achieve at school?			
<input type="checkbox"/> None	<input type="checkbox"/> A little	<input type="checkbox"/> Significant	<input type="checkbox"/> An unbearable amount

- a) Assess the survey by giving one advantage and one disadvantage. (2)
- b) The counsellor has summarised the data from all the completed survey forms in the table below. Use this summary to answer the questions that follow:

Amount of pressure experienced by students in different age groups						
	MALE			FEMALE		
	13 – 14	15 – 16	17 – 18	13 – 14	15 – 16	17 – 18
None	4	1	-	5	4	4
A little	9	4	3	7	4	6
Significant	1	3	1	3	6	8
An unbearable amount	3	4	2	2	4	7

- i) How many males and how many females participated in the survey? (2)
- ii) The counsellor wrote in his report: “*more than two out of every five teenagers feel either significant or an unbearable amount of pressure to achieve at school*”. Show how the counsellor would have come to this conclusion. (3)
- iii) Do males and females experience this pressure equally or differently? Substantiate your answer using the information in the table. (4)

c) The counsellor illustrated the following graph in his report:



- What impression does the graph create about the number of male and female participants? (2)
 - Is this impression correct? Give a reason for your answer. (2)
 - What has the counsellor done in developing the graph to create that impression? (2)
- d) The counsellor has summarised the data in a different way in the table below:

The percentage of students, in different age groups, experiencing pressure						
	MALE			FEMALE		
	13 – 14	15 – 16	17 – 18	13 – 14	15 – 16	17 – 18
None	65%	42%	x	71%	44%	40%
A little						
Significant	35%	58%	y	29%	56%	60%
An unbearable amount						

- By referring to the earlier table show that the values of x and y are both 50%. (3)
- By comparing the responses for the females according to age, describe the trend in the data by rewriting the sentence, making the best choices from the words in brackets: “(Older/younger) girls are more likely to experience significant or an unbearable amount of pressure than (older/younger) girls.” Justify your claim. (3)