

Breaking bones

The data on which this exercise is based are genuine hospital records. In the original records, however, there were a lot of technical terms relating to medical conditions. We have changed the wording of these.

Table 1 shows a very small part of a computer printout of patients attending a hospital clinic. This clinic deals with problems associated with bones and joints. The data relate to the first time that the patient concerned was seen by a doctor at the clinic.

Table 1 Extract from data relating to patients attending a hospital clinic

| Condition | Age on admittance | Sex | Number of cases |
|----------------------------|-------------------|-----|-----------------|
| Deformed toes | 78 | F | 1 |
| Fracture of upper leg bone | 78 | F | 3 |
| Osteoarthritis | 78 | F | 7 |
| Unspecified joint problem | 78 | F | 1 |
| Unspecified back problem | 78 | F | 1 |
| Other conditions | 78 | F | 1 |

The complete printout was much longer than this. It consisted of 26 pages and involved 2692 patients! The data that we collect from a survey like this, or from a laboratory investigation, are called raw data. One of the problems with raw data is that there is often so much information that it is difficult to identify trends and patterns. Before this information can be really useful, we need to process it. One of the first steps that we can take is to summarise the data in a suitable table. This usually involves grouping items of information. Table 2 is a summary of all the information provided in the printout.

Table 2 Summary of all information relating to patients attending the clinic

| Condition | Male | | | | Female | | | |
|----------------------------|-----------|-------|-------|-------|-----------|-------|-------|-------|
| | Age/years | | | | Age/years | | | |
| | 0–19 | 20–39 | 40–59 | 60–79 | 0–19 | 20–39 | 40–59 | 60–79 |
| Deformity present at birth | 4 | 0 | 1 | 0 | 14 | 0 | 0 | 0 |
| Fracture of arm bone | 49 | 12 | 5 | 2 | 13 | 3 | 1 | 7 |
| Fracture of upper leg bone | 3 | 3 | 1 | 10 | 2 | 2 | 1 | 32 |
| Fracture of lower leg bone | 7 | 9 | 4 | 0 | 9 | 2 | 5 | 4 |
| Fracture of ankle | 7 | 8 | 6 | 2 | 1 | 7 | 5 | 6 |
| Deformed toes | 0 | 2 | 6 | 5 | 4 | 17 | 39 | 25 |
| Arthritis | 0 | 11 | 46 | 83 | 0 | 4 | 49 | 167 |
| Unspecified joint problems | 13 | 52 | 52 | 33 | 6 | 45 | 72 | 71 |
| Unspecified back problems | 3 | 56 | 74 | 48 | 5 | 65 | 141 | 64 |
| Other conditions | 54 | 117 | 184 | 97 | 62 | 107 | 148 | 147 |
| Total | 140 | 270 | 379 | 280 | 116 | 252 | 461 | 523 |

1.(a) The incidence of arthritis changes with age in men. Use the data in the table to describe how

(b) Look up osteoarthritis on the internet. Use the information you find to explain your answer to part (a).

2 Oestrogen is produced by women. Once a woman reaches menopause she no longer produces this hormone. Low concentrations of oestrogen are thought to increase the risk of osteoporosis in women. Do the data in Table 2 support this? Explain the evidence for your answer. (you may need to do a bit of research to find out when women usually reach menopause).

Making comparisons

We have to be careful when we make comparisons. The data in Table 2 show you why. Look at the figures for unspecified back problems in women aged from 20 to 39 and from 60 to 79. At first sight we might think that there is no difference in the incidence of unspecified back problems in these two groups.

3 Calculate the number of women with back problems as a percentage of the total number of women in the age group who reported to the clinic for

(a) the 20–39 age group

(b) the 60–79 age group.

4 Explain why it would be useful to give the figures for osteoarthritis for males and females in the 60–79 age group as percentages.

5 (a) Describe **three** features about the fractures of arm bones shown in Table 2.

(b) Suggest explanations for your answers to part (a).