

# TESTING TREATMENTS

## Chapter 6, 6.1.4 TESTING TREATMENTS

how treatments work, and so indicate possibilities for developing better and safer treatments.

Research about the effects of treatments is relevant everywhere, but especially in communities that endeavour to share healthcare resources fairly among all patients – for example, in the British National Health Service, or the US Veterans Health Administration. In these circumstances, decisions always have to be taken about which treatments represent good value for the inevitably limited resources available for healthcare. If some patients are given treatments that have not been shown to be useful, this may mean depriving other patients of treatments that have been shown to be beneficial.

None of this should suggest that patients' and clinicians' impressions and ideas about the effects of treatments are unimportant. Indeed they are often the starting point for formal investigation of apparently promising new treatments. Following up such impressions with formal research can sometimes lead to the identification of both harmful and useful effects of treatments. For example, it was a woman who had been treated with the drug diethylstilboestrol (DES) during pregnancy two decades earlier who first suggested that this might have caused her daughter's rare vaginal cancer (see Chapter 2, p15-16). And when a patient mentioned unexpected side-effects of a new treatment prescribed for his raised blood pressure, neither he nor his doctor could have imagined that his comment would lead to the identification of an all-time best-selling drug – sildenafil (Viagra).

So, individuals' impressions about the effects of treatments should not be ignored, but they are seldom a reliable basis for drawing sound conclusions about the effects of treatments, let alone for recommending treatments to others.

### **So what are fair tests?**

Most of us know that it can be a mistake to take a media report of some new medical advance at face value. But the sad truth is that one must also be cautious about reports of treatments even in apparently reputable journals. Misleading and overblown claims about treatments are common, and it is important to be able to assess their reliability.

We run two risks in taking reports of the effects of treatments at face value. We could wrongly conclude that a helpful treatment is actually useless or even dangerous. Or we could wrongly conclude that a useless or even dangerous treatment is actually helpful. Fair tests of treatments are designed to obtain reliable information about the effects of treatments by (i) comparing like with like, to reduce distorting influences (biases); (ii) taking account of the play of chance; and (iii) assessing all the relevant, reliable evidence. This chapter and the next two chapters deal with these three principal features of fair tests.

### COMPARING LIKE WITH LIKE

#### Comparisons are key

Comparisons are key to all fair tests of treatments. Clinicians and patients sometimes compare in their minds the relative merits of two treatments. For example, they may form an impression that they or others are responding differently to a treatment compared with responses to previous treatments. Sometimes the comparisons are made more formally. As early as the ninth-century, the Persian physician al-Razi compared the outcome of patients with meningitis treated with blood-letting with the outcome of those treated without it to see if blood-letting could help.

Treatments are usually tested by comparing groups of patients who have received different treatments. If treatment comparisons are to be fair, the comparisons must ensure that like will be compared with like: that the only systematic difference between the groups of patients is the treatments they have received. This insight is not new. For example, before beginning his comparison of six treatments for scurvy on board HMS *Salisbury* in 1747, James Lind (i) took care to select patients who were at a similar stage of this often lethal disease; (ii) ensured that the patients had the same basic diet; and (iii) arranged for them to be accommodated in similar conditions (see Chapter 1, p1-3). Lind recognized that factors other than the treatments themselves might influence his patients' chances of recovery.

One way to make a test *unfair* would have been to give one of the treatments recommended for scurvy – say, sulphuric acid,