put resources into trying to get complete information from a random sample than to get poor data from the whole population of interest.⁵ Random sampling is feasible only when there is a list of all members of the relevant population. A sample survey can be made more representative of the population by stratified sampling—for example, to preserve the age-sex distribution.

Likewise, in case-control and cohort studies it may not be feasible to investigate all of the people of interest—again, random samples should be taken. Randomisation also has a place in laboratory experiments—for example, when locating samples on a 6×6 plate in an automatic analyser. Comparative experiments on animals should also use random selection of animals rather than using those most easily caught.⁶

In all types of study the use of randomisation means that no systematic bias is introduced and the samples selected should be representative of the populations of interest. Once the principles are understood, random selection or allocation is straightforward, using tables of random numbers or a random number generator on a computer.¹ The use of randomisation

does not obviate the need for care in other aspects of the design and analysis of research. For example, though randomised controlled trials are widely agreed to yield the most reliable scientific information, careless or inappropriate analysis may lead to misleading conclusions. The standard of statistics in published reports of clinical trials can be greatly improved.^{7,8}

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Juniors' new deal on hours

A 72 hour week by the end of a 5½ year plan

The pace has quickened on the long, slow march towards more humane working conditions for junior doctors. Last week their employers should have begun taking action to ensure that "as soon as practicable" no doctor in training should have to work longer than 83 hours a week. That maximum should fall to 72 hours by the end of 1994 for doctors in hard pressed posts and for all doctors by the end of 1996 (p 1483).¹ These reductions should go some way towards improving a situation that has shamed all those who have condoned it.

For many the pace of change is still too slow: the juniors originally wanted an immediate reduction to an 83 hour week with the 72 hour maximum achieved by next year. What has been offered instead, according to the Secretary of State for Health, is an achievable timetable. Its great virtue is that all sides—the government, colleges, consultants, and juniors—have signed up to it and can be held to it. Backed by the ministerial group on junior doctors' hours, regional task forces will be keeping health authorities and trusts to the timetable, providing advice as well as cracking the whip. The ministerial group, which was responsible for the agreement, will continue to monitor progress.

No one should underestimate the problems that lie ahead. On the basis of a recent BMA survey,² an estimated one in four juniors are now working longer than 83 hours a week; these on call commitments are supposed to fall "as soon as practicable." Nearly half of all doctors work in hard pressed posts; their working week is not meant to exceed 72 hours by the end of 1994. The mechanisms suggested for achieving these reductions—introducing shifts, replacing firms with teams, and allocating work done inappropriately by doctors to clerical, technical, and nursing staff—will all cause upheaval. Consultants' support will evaporate if the work is simply shifted on to them. Juniors will quickly lose their enthusiasm for the changes if their salaries decrease in proportion to their

hours. The pay review body will need convincing that although the hours of work may fall the intensity of the work will increase.

The royal colleges must throw their weight around a little more on behalf of the juniors. They could follow the lead given by the University of London and withdraw educational approval from posts that require doctors to perform duties that are the responsibilities of others.³ They could serve notice now that training posts remaining more onerous than one in three in 12 months' time will automatically forfeit their approval. And they might reconsider endorsing the statement that "for educational purposes there is normally no requirement for doctors in general professional training to be on duty for more than 72 hours per week." What "abnormal" demands of training could ever justify doctors being on duty this long? A glance across the English Channel shows that most European countries manage to train their specialists without requiring them to work longer than 60 hours a week.

This begs the question of what should be the destination of the juniors' long march. The juniors have said a 60 hour week—resources and training needs permitting. From the recent summit of 90 hours that must have seemed unattainable enough to adopt as a goal. Now it seems possible—even if the rest of the population will probably be working 35 hours a week by the time they have achieved it. Sooner or later doctors will have to address this disparity. Are their needs for a life beyond work really so different from everyone else's?

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