16.5: Equipment and supplies

The major items of equipment and reagents required must be specified in the study protocol. The choice of what technical equipment to buy should be influenced by what the investigators or others in the field have used and whether it has been found to produce valid results and is reliable in the specific field contexts required (and this will include servicing arrangements). The power requirements of electronic equipment should be considered prior to purchase. Some equipment and supplies may need to be pre-ordered from abroad, as they may not be available locally, so considerable pre-planning may be required. This is likely to be particularly relevant for the clinical and laboratory equipment and supplies (see Chapter 17). It may be important to order a basic supply of spare parts at the same time as ordering equipment, if local availability is in doubt. Purchasing of equipment and supplies locally can be open to many kinds of fraud (see Chapter 18), and steps should be taken to ensure not only that a fair price is obtained, but also that the goods are genuine and of high quality.

The field manual should include lists of all the equipment required for each of the trial procedures (for example, record cards, questionnaires, needles and syringes, laboratory supplies) and for the support of those procedures (for example, vehicles, filing cabinets and files, benches, screens, tents). Providing ‘packing lists’ to individual team members and checking that they have all the items on their list prior to departure from headquarters each day can reduce the number of requests from the field for additional supplies. Systems need to be put in place to ensure that maintenance and quality control of equipment is carried out, according to a standard schedule. Some laboratory equipment will need standardization, validation, servicing, and revalidation (see Chapter 17).

Provision for transport is essential in most LMICs. One of the most expensive items of equipment are trial vehicles, so the decision as to whether to purchase or hire them, and, if purchasing, whether to buy new or second-hand, requires careful consideration and price comparisons. Key issues are not only the capacity, purchase price, or daily hire price, but also fuel consumption, type of fuel and its local availability and price, and vehicle maintenance and reliability. It is a false economy to purchase a cheaper vehicle if it is more liable to break down, losing days of work, while it is repaired or
dug out of the mud. It is also important to check whether the funding agency imposes restrictions on which vehicles can be purchased or how vehicles should be disposed of at the end of the trial.

Transporting people and equipment will require careful planning. Extra time should be allowed for possible mishaps. If possible, backup transport should be available in case of emergencies. Maintenance of vehicles and close supervision of their use are essential. Control and discipline of vehicle use are key factors in the conduct of almost all field trials. Particular problems may arise if field staff are issued with vehicles (for example, motorcycles) that they keep at home, rather than return to a central parking place on a daily basis. When staying overnight in the field, all vehicles should be parked overnight in a secure site, such as the guesthouse or hotel where the team are staying where there is a security guard. If necessary, a guard should be hired for this purpose.

Great care should also be taken in hiring drivers, and a practical driving test that includes a section that mimics difficult field conditions should be included. It is important to remember that having a good, safe driver could not only save considerable time wasted through breakdowns or getting stuck in mud, but may also save the lives of field team members. Linked to this, strict rules as to who may and who may not drive the trial vehicles and for what purposes should be specified and enforced.

Maintenance, fuel supply, and the use of vehicles for purposes other than those for which they were intended can pose substantial problems. Careful monitoring of vehicle fuel consumption is essential, as it is not uncommon for drivers to supplement their income through fuel fraud. Common tricks include having an agreement with the fuel supplier that the receipt will show a larger volume of fuel than is actually given, siphoning off fuel, or unauthorized use of the vehicle (for example, as a taxi). Although each such theft only costs the project a relatively small amount, fuel often accounts for a substantial proportion of the non-staff recurrent costs of a field trial, and the losses can quickly add up to a sizeable amount. As well as each vehicle having a logbook with each journey requiring signed authorization by a senior member of staff, other useful techniques for minimizing fuel fraud is to allocate each vehicle to a single driver, with checks on prior fuel consumption carried out whenever the vehicle passes from one driver to another, and regular checks of fuel consumption, with the record being from full tank to full tank.

Illicit exchange of vehicle parts by vehicle mechanics is also not uncommon, either with or without the driver’s knowledge. Again, this can be minimized by selecting a reputable garage and, if necessary, marking key vehicle parts. Vehicle theft can jeopardize a field trial, so, where possible, it is very important to fit vehicles with a satellite tracking device, an immobilizer, and a gear-locking device.

Of all vehicles, motor bicycles are the most dangerous. They are often driven by fieldworkers who are young men who enjoy the status that the motorbicycle gives them and may be prone to showing off. Very strict monitoring of their use is essential. All the rules given above should apply to motorbicycle, as well as other trial vehicles, plus all motorbicycle users (drivers and their passengers) should always wear a full-face helmet. Motorbicycles are less stable, particularly in muddy or sandy conditions, when carrying two (or more!) people, rather than one, so this should be avoided, whenever possible.

Loss of other stores and supplies can also be a major problem, particularly due to theft. A staff member at the trial base should be appointed to be solely responsible for all the stores, maintaining inventories and issuing items. Each item issued should be signed for by an individual team member who should also be expected to sign the store inventory book upon return of the item. Transferring equipment between team members in the field should be discouraged and, if
necessary, should be accompanied by documentation signed by both team members. Staff should be provided with an SOP for equipment, which includes instructions on the correct use, storage, maintenance, and charging of the equipment. Staff need to know what to do when equipment is lost or stolen or stops working properly. It is advisable to provide field teams with extra backup equipment. If this is not possible, such as for large or expensive laboratory equipment, plans should be in place to deal swiftly with breakdowns.