Appropriate Technology

Essential medicines in the Third World

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For many Third World countries health care is only one problem on a priority scale that is dominated by poverty, starvation, refugees, a growing population, political unrest, and corruption. Furthermore, the type of health care problems in Third World countries is quite different from that in industrialised countries (fig 1), and infectious diseases remain a problem. Despite this high incidence of infectious diseases such countries have only a small share in the total world use of medicines (fig 2).¹ In the least developed countries spending on drugs per person per year comes to less than US\$1, whereas in the industrialised countries the corresponding figure is \$70 or more.² In many countries this is because imported drugs are too expensive and there are no facilities for the local manufacture of drugs.

If health care is to be given a priority in developing countries, treatment and medication must be available to the sick patient at the time of need. It is a stark fact, however, that throughout most of the Third World almost three quarters of the population has no access to basic health services. Hospitals and clinics are grouped in the major urban areas while most people live in the rural areas and are more or less neglected. Therefore most patients present at hospitals and clinics late, when their disease is advanced. Lack of transport, poor communications, long distances, and a lack of local medical care may transform simple and curable diseases into chronic, crippling, or life threatening conditions. Drawing up a more equitable health care system, based on the development of primary health care, calls for a firm policy on essential drugs to satisfy the real needs of most of the community. Such a policy is lacking in many countries, and even if patients reach their district hospital the drugs required for their treatment may not be available.

Availability of medicines

In this article I propose to question why "not available" is the most common answer to a request for even simple medicines, and why so many patients in the Third World are deprived of the benefits of effective treatment. The answer to the question, why not available? is difficult because usually various factors have to be considered and these may include inefficiency and corruption. In my experience common explanations why particular drugs or formulations were not available include:

- (1) Because they are too expensive and insufficient funds are available to maintain a constant supply.
- (2) Because they are in the central store but transport is not available to distribute them to clinics and hospitals.
- (3) Because the government has a foreign exchange problem and the annual drug tender has been delayed.
- (4) Because they are held up at the railway station, docks, airport, etc.
- (5) Because they have been lost (pilfered) in transit.

Typical Third World country

Typical developed (industrialised) country

FIG 1—Deaths by cause in the rich and poor countries (modified from Taylor¹).

- (6) Because the papers (import documents, customs clearance certificates, etc) have been lost.
- (7) Because they have deteriorated in the central drug store (heat, damp, etc).
- (8) Because the replacement supply was not ordered in time. The list continues ad infinitum.

FIG 2—World pharmaceutical consumption; total US\$76 000m in 1980—manufacturers' prices (modified from Taylor¹).

Essential drugs

What, therefore, is the solution? First and foremost, the ministry of health in the developing country needs to integrate a programme of importation of drugs (or their local manufacture if possible) within a coherent policy on primary health care. This requires political stability because such programmes must be long term; it also assumes that health care budgets are given adequate priority. Importation of drugs should be through a regular drug tender, and substantial saving may be achieved by purchasing generic preparations rather than branded or proprietary products. The move among some major pharmaceutical companies to manufacture generic products is particularly welcome, because it increases their availability and allays anxiety about their quality.

Selection of drugs should be based on the model list of essential drugs of the World Health Organisation (WHO),³ which may be modified or augmented according to the specific needs of the country. Whenever possible, priority should be given in the drug tender to locally based pharmaceutical industries, which should be encouraged to manufacture formulations based on the list of essential drugs. The responsibility for quality control should rest with a government laboratory which can ensure that preparations manufactured locally and imported products or raw materials are of a satisfactory standard. Setting up a quality control laboratory may, however, be difficult in small countries which lack the necessary financial, physical, and trained resources, and with these countries in mind the WHO drug certification scheme has been introduced to ensure that imported drugs conform to international standards. Use of this scheme might be combined with more efficient use of the quality control laboratories that are already established, some of which have been set up on a cooperative regional or subregional basis.

Offers of help

Information and guidance on the procedures concerned in obtaining drugs are given by the International Federation of Pharmaceutical Manufacturers Associations (IFPMA). This organisation covers both the developed and the developing world, and its member associations include not only the 100 or so international, research based pharmaceutical companies but also many thousands of small national manufacturing companies producing standard products.^{4,5}

The International Federation has taken an active interest in the WHO action programme on essential drugs and, through its international code of pharmaceutical marketing practices,⁶ it has done much to counteract the claim by some Third World countries that they are the dumping ground for unwanted, obsolete, and poor quality drugs.^{7,8} IFPMA also provides, advises, and runs training courses on topics such as the distribution and procurement of drugs. In addition, courses in quality control of drugs are arranged for trainees from government laboratories and inspection services in the Third World.

Many Third World countries claim that they are not supplied with information about indications, contraindications, and side effects of individual drugs. In response to this, the International Federation has offered to supply (free of charge to government health departments) standard compendia listing this sort of information—for example, the *Physician's Desk Reference* (USA), the Association of the British Pharmaceutical Industry's *Data Sheet Compendium* (UK), the *Rote List* (Federal Republic of Germany), and the *Dictionnaire Vidal* (France). The problem remains, however, that owing to bureaucratic inertia or inefficiency the information contained in these compendia is not always passed on by the health ministry to the practitioners who need it.

Local drug manufacture

The United Nations Industrial Development Organisation (UNIDO) is concerned with helping developing countries to industrialise, and the manufacture of pharmaceuticals is one of the industries that they have singled out for special attention. The United Nations Conference on Trade and Development (UNCTAD) has been negotiating an international code of conduct on the transfer of technology, and an agreement by which local manufacturers may gain technical know how from the larger international companies. The WHO, and the World Bank—or in some cases regional development banks—are already collaborating in several industrial projects. Clearly if a group of countries got together and agreed to have a single commercial production unit for essential drugs this would count as technical cooperation between developing countries and would attract grants and funding, which is one of the priorities within the United Nations system.⁹

Unfortunately, the development of a locally based pharmaceutical industry does not have priority in some Third World countries, simply because the government is more interested in providing employment in more labour intensive industries, with a predominance of unskilled or semi-skilled jobs. The pharmaceutical industry is not labour intensive and depends largely on a small core of local or expatriate skilled staff. Nevertheless, a local pharmaceutical industry is an important contribution to the overall provision of health care and must be recognised as such, although it does not necessarily produce cheap drugs, nor does the manufacture of essential drug preparations tend to attract large profits. Thus the local industry needs to be protected by concessions to facilitate the import of raw materials, containers, and packaging materials. It is reasonable to expect such concessions provided that the companies are manufacturing essential drugs with a view to improving health care and not producing non-essential proprietary preparations or cosmetics.

Storage and distribution

Even if an adequate supply is ensured there may still be problems of storage and distribution, especially if supplies are centralised in a government drug store. Road and rail systems in developing countries are often poor, so that the distribution of consumable items from urban to rural areas suffers. Medicines should, however, be given priority and not regarded as ordinary items of commerce.

Whereas the role of the medical practitioner is traditionally appreciated and understood in all Third World countries (particularly in the governmental administrative service), that of his pharmaceutical counterpart is less well understood. Many countries

fail to understand that expert pharmaceutical advice is essential not only for drug procurement but also for effective storage, distribution, and legislative control. Many countries rely on inadequately trained dispensers to staff hospital pharmacies, on store keepers to control distribution of drugs from central stores, and on doctors or administrators to control their drug tenders. This is wasteful, and it fails to take account of the skill of the pharmacist and the benefits that can accrue from having expert pharmaceutical advice about the ordering, quality testing, storage, distribution, and supply of medicines.

Hospital manufacture

Local manufacture of pharmaceuticals is invariably thought of as a commercial enterprise, but a lot can be done in the hospital pharmacy provided that expert advice and skills together with the necessary equipment are available. The range of equipment required will depend on which preparations are manufactured, but this need not be extensive. Advice on the choice of equipment, and subsequent servicing, may be obtained from the Third World project of the *Fédération Internationale Pharmaceutique*.^{10 11}

Producing a hospital formulary of essential drugs may cut the hospital's total drug bill, and the manufacture of simple solid and liquid oral dosage forms, topical preparations, injection solutions, and sterile eye preparations may not only save money but also ensure that these preparations are readily available and that they can be freshly prepared according to demand. A formulary—for example, one based on the *British National Formulary*—will also do much to standardise treatments and prevent the prescription of unnecessary preparations.

Containers

Suitable containers for dispensed medicines do not exist in many developing countries. Tablets are dispensed in a screw of paper; liquid formulations are filled into Pepsi Cola bottles; sterile eye ointments are spread on to paper and given to the patient as a crude package; sterile eye drops or lotions are put into cans, bottles, tins,

or whatever container the patient can buy at the stall at the entrance to the hospital. Thus the Third World urgently needs an inexhaustible supply of simple plastic universal containers that may be sealed and made air and water tight. Clearly, there is little use in dispensing essential medicines if they are spoilt or allowed to deteriorate almost immediately in unsuitable containers. It would be better to allocate a part of the budget for outpatients' drugs to providing cheap and simple containers. At least one manufacturer in each country should be encouraged to produce a standard container for outpatient use. It has been done for yogurt in some Third World countries, so why not for medicines? It may then be possible to write simple instructions (or draw pictorial labels) on the containers so that the patient uses the medicine correctly. It is practically impossible to write instructions on a screw of paper—I know, I've tried.

References

- 1 Taylor D. *Medicines, health and the poor world*. London: Office of Health Economics, 1982.
- 2 Fattorusso V. Essential drugs for the Third World. *World Development* 1983;11:177-9.
- 3 World Health Organisation. The use of essential drugs. Report of a WHO expert committee. *WHO Tech Rep Ser* 1983;685:1-46.
- 4 Peretz SM. Pharmaceuticals in the Third World: the problem from the suppliers' point of view. *World Development* 1983;11:259-64.
- 5 Peretz SM. IFPMA's current activities and involvement with UN agencies. In: *Pharmaceuticals in developing countries. Cost-effectiveness of pharmaceuticals*. (11th IFPMA Assembly, Washington, June 1982.) Zurich: International Federation of Pharmaceutical Manufacturers Associations, 1982:71-80.
- 6 International Federation of Pharmaceutical Manufacturers Associations. Code of pharmaceutical marketing practices (1981). *World Development* 1983;11:313-5.
- 7 Melrose D. *Bitter pills. Medicines and the Third World poor*. Oxford: Oxfam Public Affairs Unit, 1982.
- 8 Muller M. *The health of nations. A north-south investigation*. London: Faber and Faber, 1982.
- 9 Balasubramaniam K. The main lines of cooperation among developing countries in pharmaceuticals. *World Development* 1983;11:281-7.
- 10 D'Arcy PF. Action programmes: FIP Third World project. *Pharmacy International* 1983;4:157-8.
- 11 Fédération Internationale Pharmaceutique. Training and communication: means of solving problems in the Third World. *Pharmacy International* 1983;4:306-10.

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MATERIA NON MEDICA

The dirty cupboard door

Dr Prior's article on anaesthetics (9 June, p 1750) brings back memories of when our African town hospital received its first Oxford English Vaporiser, its arrival coinciding with my arrival in total charge. Its usage explained to my African chief anaesthetic orderly, he soon became a most efficient, and rightly proud, operator of this machine. A few days later an impending inspection of the hospital by His Excellency the Governor was announced. Everyone set to with a will to clean and scour the hospital till all was neat and tidy and glowingly polished. The anaesthetist began to pray that during the inspection an emergency patient would be under anaesthesia so that HE could admire the technique and expertise.

The day before the inspection my senior Asian assistant physician returned from leave. He approved everything but, wise in experience, he queried why there was no dirty cupboard door, and explained his reasoning. I left it to him. As we escorted the Governor around, in an obscure corner we saw that the door of a cupboard—which had been startlingly clean the day before—was now grubby. His Excellency's unerring eye gleamed as he spotted it and he demanded that the door be unlocked. Of course, the key was "lost" and a tense minute ensued before it was "found." The door was opened to reveal spotlessly tidy shelves on which rested various hospital stainless steel objects, all cleaned and polished to perfection. I caught the Governor's eye as he turned away and I am sure that he "knew." But the moment passed as my sleeve was pulled by the anaesthetist, clearly in a state of excitement. An emergency had arrived, no diagnosis made, but could he get the patient under anaesthesia before HE arrived at the operating theatre? He would just have time to get

the patient under. To his disappointment, and perhaps my own, I discouraged him. I don't think he ever forgave me that moment of departed glory.—JNP DAVIES, former district medical officer, Jinja, Uganda.

What is the suitability for human consumption or otherwise of a year old infusion made from scented geranium (the citrus variety—pelargonium) with Smirnof Vodka (65° 5 proof)? The infusion was made by soaking the leaves in the vodka for one month with daily shaking in a tightly closed bottle from which a clear pale yellow fluid with a little sediment was strained.

Geranium (or pelargonium) oil is an essential oil containing mainly citronellol and geraniol which is soluble in alcohol and is used for perfuming tooth-powders, ointments, and cosmetics. The acceptable daily intake of the oil is up to 500 µg/kg body weight. Larger doses may produce gastrointestinal irritation, with nausea, vomiting, and diarrhoea. Efficient extraction of the oil from pelargonium leaves requires maceration, and this may have to be repeated to avoid leaving appreciable amounts of the oil behind. It is unlikely that just soaking the leaves would extract more than a small amount, well below that which could produce adverse effects. I think, therefore, that the infusion described would be safe but I have no idea whether it would be palatable.—L BEELEY, consultant clinical pharmacologist, Birmingham.

Martindale. *The Extra Pharmacopoeia*. 20th edition. London: Pharmaceutical Press, 1982: 670 and 676.