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Introduction to traditional medicine

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> Foolish the doctor who despises the knowledge acquired by the ancients.
> Hippocrates

Almost 20 years ago the World Health Organization (WHO) estimated that 'In many countries, 80% or more of the population living in rural areas are cared for by traditional practitioners and birth attendants'.[1] It has since revised its view, adopting a rather safer position, now stating: 'most of the population of most developing countries regularly use traditional medicine.'[2] Whereas most people use traditional medicine in developing countries, only a minority have regular access to reliable modern medical services:[3]

- In China, traditional herbal preparations account for 30–50% of the total medicinal consumption.
- In Mexico the government is building regional health centres staffed by traditional healers who also receive training in how to detect diseases. The practitioners include traditional midwives (*parteras*), herbalists (*herbalistos*), bone-setters (*hueseros*) and spiritual healers (*curanderos* or *prayers*).
- In Ghana, Mali, Nigeria and Zambia, the first line of treatment for 60% of children with high fever resulting from malaria is the use of herbal medicines at home.
- In South Africa an estimated 250 000 traditional healers supply healthcare to around 80% of the black population using knowledge that dates back as far as 1000 BC.[4]
- In several African countries traditional birth attendants assist in most births according to WHO estimates.

- In industrialised nations some traditional therapies, in particular traditional Chinese medicine, and ayurveda, have become popular, diffusing out from immigrants into the host community.

Countries in Africa, Asia and Latin America use traditional medicine to help meet some of their primary healthcare needs. In Africa, up to 80% of the population use traditional medicine for primary healthcare. Over one-third of the population in developing countries lack access to essential medicines. Figure 1.1 shows the global distribution of traditional medicine, indicating which countries have specific policies as to its practice.

The provision of safe and effective traditional medicine therapies could become a critical tool to increase access to healthcare. In 2004 the South African Health Minister, Manto Tshabalala-Msimang, suggested that the use of African traditional medicines may eventually replace antiretrovirals in the treatment of HIV and AIDS.

In a number of industrialised countries many people regularly use some form of traditional complementary and alternative medicine (TCAM) with Germany (75%),[5] Canada (70%)[6] and England (47%)[7] being examples.

Definition

The WHO defines TCAM as referring to health practices, approaches, knowledge and beliefs incorporating plant-, animal- and mineral-based

Figure 1.1 The global distribution of traditional medicine, indicating which countries have specific policies as to its practice. (Adapted from WHO *Global Atlas of Traditional, Complementary and Alternative Medicine*, Map Volume. Kobe, Japan: WHO Centre for Health Development, 2005: 49.)

medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being.[2]

This definition makes no mention of the fact that the term 'traditional medicine' differs from other types of complementary and alternative medicine in that it is usually considered to be associated with discrete populations or geographical locations.

In this book the term 'traditional medicine' is used to describe:

> Health traditions originating in a particular geographic area or ethnic group and which may also have been adopted and/or modified by communities elsewhere.

Disciplines such as aromatherapy, medical herbalism, homoeopathy and others, usually known collectively as complementary and alternative medicine, are described in detail in a companion volume.[8]

The major traditional healing systems that have survived the impact of modern biomedicine driven by germ theory are traditional Chinese medicine and its associated therapies (see Chapter 6), Indian systems of medicine (see Chapter 7) and traditional African medicine (see Chapter 5).[9] The last differs from the two Asian systems in that it is largely an oral tradition with no written records whereas the Asian systems have written philosophies and pharmacopoeias.

The distinction between traditional medicine and what is known as folk medicine is not clear cut and the terms are often used interchangeably. Folk medicine may be defined as 'treatment of ailments outside clinical medicine by remedies and simple measures based on experience and knowledge handed down from generation to generation'. Another simpler definition is 'the use of home remedies and procedures as handed down by tradition'. In traditional medicine there is usually a formal consultation with a practitioner or healer and such practices may be integrated into a country's healthcare system, while in folk medicine advice is passed on more informally by a family member or friend and there is no such integration. Thus, acupuncture may be considered as being traditional medicine while the use of chicken soup – 'Jewish penicillin' – to manage poor health is folk medicine (see Chapter 11).

The role of medicines in traditional communities

The study of traditional medicines and their manufacture has much to offer to sociocultural studies of many medical systems. Medicines constitute a meeting point of almost any imaginable human interest: material, social, political and emotional.[10] They also play their many roles at different levels of social and political organisation: in international policy and funding, in

national politics, and as vehicles of ideology and identity construction.[11] Ultimately medicines affect the private lives of individual patients, e.g. in the context of a consultation with the healthcare provider they are the conduit through which ill-health is transformed to good health. In the context of the family, buying a medicine for a relative can emit a message of love and care. Within a religious context medicines may be seen as gifts to the ailing community from holy leaders.

WHO activities in traditional medicine

The driving force for traditional medicine is provided by the people who use it. However, the ability of governments in the developing world to implement the opportunities offered by traditional medicine is, in many instances, beyond their capability. WHO initiatives are crucial in stimulating traditional healthcare.

The International Conference on Primary Health Care, meeting in Alma-Ata on 12 September 1978, declared a need for urgent action by all governments, all health and development workers, and the world community to protect and promote the health of all the people of the world.[12] The goal of the Alma-Ata Declaration was health for all by the year 2000 through promotion and strengthening of systems based on primary healthcare. The Alma-Ata Declaration was especially significant for traditional medicine. Although traditional medicine has been used for thousands of years and the associated practitioners have made great contributions to human health, it was not until the Alma-Ata Declaration that countries and governments were called upon to include traditional medicine in their primary health systems for the first time, and to recognise the associated practitioners of traditional medicine as a part of the healthcare team, particularly for primary healthcare at the community level. It was at this time that the WHO's Traditional Medicine Programme was established.

The main objectives of the WHO programme are:

- to facilitate integration of traditional medicine into the national healthcare system by assisting Member States to develop their own national policies on traditional medicine
- to promote the proper use of traditional medicine by developing and providing international standards, technical guidelines and methodologies
- to act as a clearing house to facilitate information exchange in the field of traditional medicine.

Many Member States and many of WHO's partners in traditional medicine (UN agencies, international organisations, nongovernmental

organisations [NGOs], and global and national professional associations) contributed to a Strategy for the WHO and expressed their willingness to participate in its implementation. The Strategy was reviewed by the WHO Cabinet in July 2001 and, after Cabinet comments, was revised before being printed in January 2002. In 2003, the 56th World Health Assembly called on countries to adopt and implement the Strategy.[13] The Strategy advocates national policies and regulations, drug-safety monitoring systems, measures to protect knowledge of traditional medicine and plant resources and, where appropriate, the intellectual property rights of traditional practitioners.

Traditional medicine in practice

Two examples of studies that illustrate the use of traditional medicine are give below. The first study aimed to highlight the new or lesser known medicinal uses of plant bioresources along with validation of traditional knowledge that is widely used by the tribal communities to cure four common ailments in the Lahaul-Spiti region of western Himalaya.[5] The study area inhabited by Lahaulas and Bodhs (also called Bhotias) is situated in the cold arid zone of the state of Himachal Pradesh (HP), India. During the ethnobotanical explorations (2002–6), observations on the most common ailments, such as rheumatism, stomach problems, liver and sexual disorders, among the natives of Lahaul-Spiti were recorded. Due to strong belief in the traditional system of medicine, people still prefer to use herbal medicines prescribed by local healers. A total of 58 plant species belonging to 45 genera and 24 families, have been reported from the study area to cure these diseases. Maximum use of plants is reported to cure stomach disorders (29), followed by rheumatism (18), liver problems (15) and sexual ailments (9). Among the plant parts used, leaves were found most widely in herbal preparations (20), followed by flowers (12) and roots (11), respectively. Most of these formulations were prescribed in powder form, although juice and decoction forms were also used. Plants with more than one therapeutic use were represented by 24 species; however, 34 species have been reported to be used against a single specific ailment. Validation of observations revealed 38 lesser known or new herbal preparations from 34 plant species, where 15 species were used to cure stomach disorders, 7 for rheumatism, 10 for liver disorders and 6 for sexual problems. Mode of preparation, administration and dosage are discussed along with the family and local names of plants and plant parts used.

The second study investigated the use of traditional herbal medicine by AIDS patients in Kabarole District, western Uganda.[14] Using systematic sampling, 137 AIDS patients were selected from outpatient departments of 3 hospitals and interviewed via questionnaire. The questions related to such areas as type and frequency of herbal medicine intake, concomitant herb–pharmaceutical drug use (including herb–antiretroviral drug cotherapy)

and the perceived effectiveness of herbal medicine. Overall, 63.5% of AIDS patients had used herbal medicine after HIV diagnosis. Same-day herbal medicine and pharmaceutical drug use was reported by 32.8% of AIDS patients. Patterns of traditional herbal medicine use were quite similar between those on antiretroviral therapy and those who received supportive therapy only. The primary conclusion is that AIDS outpatients commonly use herbal medicine for the treatment of HIV/AIDS.

When many people from developing countries of the world emigrate, they continue to seek medical advice from traditional practitioners working in their own communities, even in countries where all citizens have free access to good-quality western medicine.[15] They have difficulties adjusting to a new lifestyle, let alone to a new system of medicine. It is not surprising that they turn to their own healers, who emigrated before them and practise healthcare much the same as they did in their home countries. Although the main reasons for this are probably cultural and linguistic, the role of mistrust and fear should also be acknowledged. However, the situation is complex. Despite gaining skills that help immigrants improve their socio-economic status and overcome barriers to the mainstream host healthcare system, their health status may still decline as acculturation increases. Waldheim suggests that migration need not always lead to disease.[16] Working with Mexican immigrants in the USA she concluded that the maintenance of a Mexican culture that is distinct from the rest of American society helps ensure that traditional medical knowledge is not lost, whereas the social networks that link Mexicans to each other and to their homeland help minimise threats to health, which are usually associated with migration. Thus, increased access to professional medical care may not improve the health of migrants if it comes with the loss of traditional medical knowledge.

The ethnic medical systems embrace philosophies very different to those of the west. They are derived from a sensitive awareness of the laws of nature and the order of the universe. Practised according to traditional methods, their aim is to maintain health as well as to restore it. The ideas are complex and require much study to grasp their significance and the nuances of practice.

Traditional medical systems are challenging because their theories and practices strike many conventionally trained physicians and researchers as incomprehensible. Should modern medicine dismiss them as unscientific, view them as sources of alternatives hidden in a matrix of superstition or regard them as complementary sciences of medicine?[17]

National policies for traditional medicine

There has been intense debate on public health issues associated with Traditional Medicine in many parts of the world. The focus is to determine

the most appropriate official policy towards traditional medicines. Some countries have policies that discourage traditional medicines, whereas others have supportive policies. Most countries do not have official policies and have simply left traditional medicines to individuals to decide.[18] For indigenous peoples, the existence of traditional medicine policies is crucial. The ability to use and control their own, culturally defined, traditional health system is the most fundamental right of self-determination of 'fourth world' peoples.

Figure 1.2 shows those countries of the world that have policies and legislation covering the practice of herbal medicine

Asia

In Asia medical pluralism – the use of multiple forms of healthcare – is widespread. Consumers practise integrated healthcare irrespective of whether integration is officially present. In Taiwan, 60% of the public use multiple healing systems, including modern western medicine, Chinese medicine and religious healing. A survey in two village health clinics in China's Zheijang province showed that children with upper respiratory tract infections were being prescribed an average of four separate drugs, always in a combination of western and Chinese medicine.[19] The challenge of integrated healthcare is to generate evidence on which illnesses are best treated through which approach. The Zheijang study found that simultaneous use of both types of treatment was so commonplace that their individual contributions were difficult to assess.

Asia has seen much progress in incorporating its traditional health systems into national policy. Most of this began 30–40 years ago and has accelerated in the past 10 years. In some countries, such as China, the development has been a response to mobilising all healthcare resources to meet national objectives for primary healthcare. In other countries, such as India and South Korea, change has come through politicisation of the traditional health sector and a resultant change in national policy.

Two basic policy models have been followed: an integrated approach, where modern and traditional medicine are integrated through medical education and practice (e.g. China), and a parallel approach, where modern and traditional medicine are separate within the national health system (e.g. India).

Africa

In Africa the heads of state and government of the then Organization of African Unity (OAU) recognised that about 85% of the African population resort to it for their health delivery needs.[20] In 2001, the OAU declared a

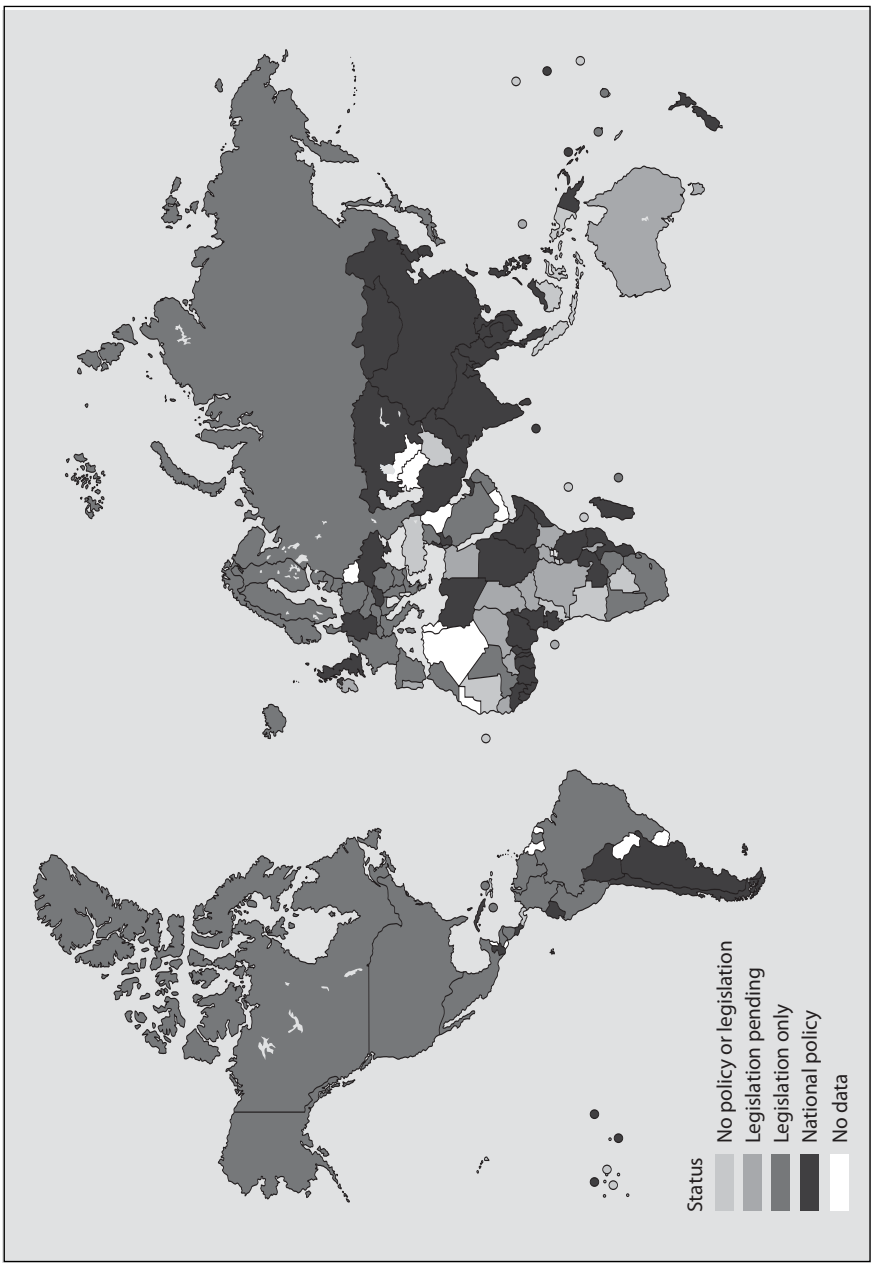

Figure 1.2 Countries of the world that have policies and legislation covering the practice of herbal medicine. (Adapted from WHO *Global Atlas of Traditional, Complementary and Alternative Medicine*, Map Volume. Kobe, Japan: WHO Centre for Health Development, 2005: 12.)

Decade of Traditional Medicine. After this landmark commitment by African leaders, the First AU Session of the Conference of African Ministers of Health (CAMH1), held in April 2003 in Tripoli, Libya, adopted the Plan of Action and implementation mechanism that was endorsed by the AU summit heads of state and government in Maputo in 2003. The main objective of the Plan of Action is the recognition, acceptance, development and integration/institutionalisation of traditional medicine by all Member States into the public healthcare system in the region by 2010. Moreover, the Maputo Declaration on Malaria, HIV/AIDS and Other Related Infectious Diseases (ORID) of July 2003 further resolved to continue supporting the implementation of the Plan of Action for the AU Decade of African Traditional Medicine (2001–10), especially research in the area of treatment for HIV/AIDS, tuberculosis (TB), malaria and ORID. In July of the same year, the Lusaka Summit declared the period 2001–10 as the OAU Decade for African Traditional Medicine. The 11 priority areas, which have been developed as strategic activities, are:

- Sensitisation of the society to traditional medicine
- Legislation of traditional medicine
- Institutional arrangements
- Information, education and communication
- Resource mobilisation
- Research and training
- Cultivation and conservation of medicinal plants
- Protection of traditional medical knowledge
- Local production of standardised African traditional medicines (SATMs)
- Partnerships
- Evaluation, monitoring and reporting mechanisms.

Since 2001, AU Member States have been implementing the plan of action of the AU Decade of African Traditional Medicine and the priority interventions of the WHO regional strategy, namely policy formulation, capacity building, research promotion, development of local production including cultivation of medicinal plants and protection of traditional medical knowledge and intellectual property rights.

Commonwealth

Key policy issues in integration have been outlined by Commonwealth health ministers.[15] Ministers established the Commonwealth Working Group on Traditional and Complementary Health Systems to promote and integrate traditional health systems and complementary medicine into national healthcare.

Europe

Unfortunately, at the present time it is generally recognised that regulation of traditional systems of medicine, the products used in traditional systems and the practitioners of these systems is very weak in most countries.[21] Despite being made up of 27 European Member States in which a significant proportion (at least 33%) of the population use non-orthodox medicine (including traditional medicine) as part of their healthcare provision, the EU currently has hardly any policies that specifically refer to traditional therapies. In 1997 the European Parliament adopted a resolution that called for steps to regulate and promote research in 'non-conventional medicine', including Chinese herbal medicine and shiatsu.[22] The report's rapporteur, Paul Lanoye MEP, was so disappointed in the way that the report had been weakened by negative amendments that he abandoned it at the last minute and forced the Parliament's Chairman at the time, Mr Collins, to add his name to it to enable it to be adopted.

One of the main reasons for this is that the EU Treaties are worded so as to protect the area of healthcare delivery as the responsibility of individual member states.

The lack of regulation leads to misuse of the medicines by unqualified practitioners and loss of credibility of the system. In traditional medicine, practitioners and manufacturers (particularly the small ones) usually oppose any steps to strengthen regulation by the health administration. Their fears are that regulation such as applies to allopathic medicine is not suitable for traditional medicine. The World Health Organization has initiated an effort in this direction and may be the appropriate body to help countries not only to develop a regulatory system but to take steps to meet the obligations under the Trade-related Intellectual Property Rights Agreement, when this became applicable in developing countries in 2005. It means that traditional healers (*hakkims*) who have come to the UK may practise within a culture that is oblivious to the highly regulated status of western medicine. Healthcare providers should be vigilant to ensure that any risks to patients are minimised.

All the foregoing may seem to indicate that integrating traditional and western medicine is at best difficult and at worst impossible. Most of the remarks in this chapter are directed at Chinese and Asian medicine, these two systems being the two traditional disciplines that health care providers are most likely to meet in the UK. It should be noted that traditional medicines in other cultures also flourish and many are integrated into local healthcare. In their own countries Australian Aboriginals,[23] New Zealand Maoris,[24] North American Indians,[25,26] Africans,[27,28] Pacific Islanders[29] and the peoples of Latin America[30] continue to make important contributions to their national cultures and fulfilling healthcare needs.

Each culture has its own range of remedies, although some elements are common to all. One notable success to cross the cultural divide is an essential oil obtained from the Tea tree (*Melaleuca alternifolia*) native to Australia. The oil is claimed to be anti-fungal, and antibiotic, and is used topically. It has become a popular and effective remedy in Europe.

Traditional healers may be called shamans. They practise a method of healing that is supplemented by rituals and explanatory systems appropriate to their particular culture and environment. The healing often includes meditation, prayer, chanting and traditional music (e.g. Celtic drumming), together with the administration of herbal, and occasionally orthodox, remedies.

Evidence

Scientific evidence is available only for the many uses of acupuncture, some herbal medicines and some of the manual therapies. Further research is urgently needed to ascertain the efficacy and safety of several other practices and medicinal plants.

The limited scientific evidence about the safety of traditional medicine and its efficacy, as well as other considerations, make it important for governments to:[2]

- formulate national policy and regulation for the proper use of traditional medicine/CAM and its integration into national healthcare systems in line with the provisions of the WHO strategies on traditional medicines
- establish regulatory mechanisms to control the safety and quality of products and of traditional medicine/CAM practice
- create awareness about safe and effective traditional medicine/CAM therapies among the public and consumers
- cultivate and conserve medicinal plants to ensure their sustainable use.

Safety

The globalisation of traditional medicine has important implications for both the quality control of medicaments and the training and competence of practitioners.[31] Furthermore, when traditional healthcare procedures are incorporated into complementary and alternative medicine in industrialised countries there is an increased need for vigilance. The WHO has issued a number of documents relevant to the safety of traditional healthcare (available at http://tinyurl.com/pgog8f).

Factors affecting safety

The following safety matters are a source of concern in ethnic medicine: training, uncontrolled products and concurrent therapy.

Training

Practitioners' training varies widely, raising concerns for the quality of the treatment being offered. Little is being done currently to regulate the delivery of traditional healthcare.

Uncontrolled medicinal products

Large amounts of traditional medicines are imported into the UK, legally and illegally, and use of such medicines is frequently not admitted when serious illness forces patients to consult western medical practitioners. These medicines carry with them a risk of adverse reactions; the risk needs to be quantified and as far as possible minimised. Examples of intrinsic toxicity and quality issues associated with traditional Chinese and ayurvedic medicines are described in detail in Chapters 6 and 7. Kava-kava (see Chapter 10) is a recreational herb used widely by Pacific Islanders. It has been banned in Europe, the UK and Canada due to concerns over liver toxicity, although the link has not been proved irrefutably. There are an estimated 250 million people around the world using the herb each year. However, it is claimed that, in almost all cases, the adverse effects have not been definitely attributed to kava-kava and in most cases they were associated with liver damage from alcohol or pharmaceutical drugs. Kava-kava has been reported by researchers at the University of Queensland as being safe and effective at reducing anxiety and improving mood.[32] These results may prompt a future reassessment of the drug by regulatory authorities.

An issue under discussion by European regulatory authorities is whether the proposed herbal medicines directive (see Chapter 6) should extend to traditional medicines containing non-herbal ingredients, such as those used in Chinese and ayurvedic medicine.

The UK Medicines and Healthcare products Regulatory Agency (MHRA) established an ethnic medicines forum to encourage and assist the UK ethnic medicines sector to achieve improvements to safety and quality standards in relation to unlicensed ethnic medicines, in advance of any improvements to the statutory regime that might emerge from current policy initiatives. Representatives of ayurvedic and traditional Chinese medicine suppliers, manufacturers and practitioners in the UK form part of this forum, as well as the MHRA and other bodies in the herbal medicines sector with experience of operating self-regulatory arrangements.

One issue identified by the forum is the lack of understanding of existing law by some of those operating in the ethnic medicines sector. The document

Traditional Ethnic Medicines: Public health and compliance with medicines law, published on the MHRA website, highlights problem areas.[33] It aims to help consumers make an informed choice and seeks to assist businesses and practitioners to understand certain aspects of medicines law.

Concurrent therapy

Patients with chronic or recurrent conditions are particularly vulnerable because they tend to lose confidence in conventional medicine and resort to self-medication without informing their general practitioner.

What needs to be done to ensure the safety of traditional medicine?

There can be no doubt that safety issues are of extreme concern as the use of traditional therapies increases in a largely uncontrolled manner. Travel by tourists and business people to long-haul destinations has brought increasing numbers of people into contact with other cultures.

Immigration brings different cultures to enrich our own. Whether you consider traditional medicine to have a part to play in modern medicine is for you alone to decide.

The risks of participating in traditional Chinese medicine or ayurveda are certainly outweighed by the many benefits that are reported. Adverse reactions are relatively rare, although when they do happen they can be very severe. Perhaps the best solution is to control the practice, improve training and license the medicines. However, there are problems in establishing these ideals.

Practitioners of traditional medicine certainly need to be more aware of the problems of toxicity. In particular, they must learn that infrequent adverse drug reactions will not be recognised without a formal system of reporting. They must participate in such a scheme, and consideration should be given by the MHRA in the UK to making such reporting compulsory, as it is in Germany and China. This is a significant deficiency and, until a formal mandatory system of reporting adverse reactions for traditional medicine becomes available, healthcare providers should be aware of the potential difficulties, advise the public of the dangers whenever necessary, and record and report any problems promptly in the mainstream literature.

Practitioners of orthodox and traditional medicine need to be aware of the occurrence and dangers of dual treatment. Patients need to appreciate that they must disclose exactly what they are taking; such information should be recorded carefully because, as stated above, there is a risk that patients will receive simultaneous western and traditional treatments, particularly when self-treating. This may require a sympathetic non-judgemental approach to questioning. Purchasers of traditional medicines should be advised accordingly.

All practitioners who offer traditional medicines need thorough training and continuing education.[2] Great attention has been paid to the quality of training and further education in orthodox western medicine, and it is time to police more carefully the practice of traditional medicine in the UK. For European herbal medicine this should be easy. The training establishments are situated in the UK, which makes guaranteeing standards and limiting the right to practise to those who are thoroughly trained relatively straightforward. It is much more difficult in the case of traditional Chinese and Indian medicine, because full training cannot currently be obtained in the UK. Verifying the quality of the training given in China and India by identifying appropriate qualifications and recognising them seems prudent. Practitioners who are not qualified should be barred from practice in the UK, and policing this would clearly require a powerful registration body. Ultimately, the creation of academic establishments in the UK, where such training could be given under appropriate regulation, should be considered.

Traditional medicine and the orthodox healthcare provider

Many healthcare providers may not relish the thought of taking a proactive interest in traditional medicine. However, given their role within the multicultural society in which most of us live, the possibilities of coming into contact with traditional Chinese medicine and ayurvedic medicine is possible for a number of reasons:

- concern over interactions between traditional remedies and orthodox medicines
- concern over using traditional remedies during pregnancy
- concern over intrinsic toxicity of traditional remedies and cosmetics, and the safety of some procedures
- the necessity of considering and understanding a patient's total healthcare status when designing pharmaceutical care plans.

The practice of traditional medicine involves concepts with which people in the west are generally unfamiliar. It may be that, with more understanding of the therapies involved, some can be incorporated into our own procedures, e.g. our focus on treating illness could be shifted more towards maintaining health – a process that has already started. We may be able to understand better the needs of our immigrant communities and perhaps use approaches with which they feel more comfortable. A three-step process to assist orthodox healthcare providers in their approach to traditional medicine is presented in Chapter 3.

Biodiversity and sustainability[34]

Environmental awareness

It is estimated that up to 40% of all pharmaceuticals in industrialised countries are derived from natural sources. In the USA about 2% of prescriptions written by healthcare providers are for drugs that have natural ingredients, are synthetic copies or have artificially modified forms of natural chemicals. The search continues for more therapeutically active plant-sourced materials, not always to the satisfaction of host communities.

Two centuries ago, orthodox medicine was offering digitalis and laudanum, but now there are thousands of powerful, efficacious drugs that save lives somewhere almost every second of the day.[35] However, modern drugs struggle to make much impact on the rise in cancer, heart disease and other afflictions of the industrialised world.

This lack of efficacy, together with patients' growing unease over side effects of synthetic drugs, has coincided with an international growth in environmental awareness, particularly concern about the depletion of natural resources. In turn, this has led to a greater sensitivity to the delicate symbiotic balance that exists in nature.

Disappearing rainforests

Unfortunately the rain-forest is being destroyed at such a rate that thousands of species may become extinct before their medicinal potential can be examined. Five thousand years ago the rainforest covered 2 billion hectares, or 14% of the earth's land surface. Now only half remains, but it is inhabited by 50% of all the plants and animals found on the globe.[36] Humans are continuing to destroy an area equivalent to 20 football fields every day, a rate that if maintained will cause the rainforest to vanish by 2030. Slash-and-burn agriculture accounts for 50% of the annual loss. This is a primitive system that involves cutting down a patch of forest and setting the timber alight to release phosphorus, nitrogen, potassium and other nutrients. The resulting ash fertilises the sod, which will then support crops for 2 or 3 years. After this time the land becomes barren, necessitating the clearing of another patch of forest. Logging is a second major cause of forest destruction. In 1990, 3.5 billion cubic metres of tropical wood were felled throughout the world, more than half for fuel sources.

Trees are also consumed for their important products, e.g. India earns US$125m annually from its production of perfumes, essential oils, flavourings, resins and pharmaceuticals. The petroleum nut tree (*Pittosporum resiniferum*) yields oil that can power engines as well as provide a homoeopathic remedy. Other examples are the bark of the Cinchona tree which gives the antimalarial quinine (also known as *china*), products of immense

historical significance to homoeopathy. In Madagascar, common *Cantharanthus* (Vinca) species are exploited for the anti-cancer drugs vinblastine and vincristine, two naturally occurring alkaloids isolated in the early 1960s by the pharmaceutical company Eli Lilly. Although there is no fear of these particular plants becoming extinct, serious damage has been done to the ecosystem of which they are a part.

Growing demand

Curare, the South American poisonous vine extract, is a muscle relaxant. In fact, the Amazon Indians use at least 1000 plants medicinally. In Malaysia and Indonesia more than twice this number of plant materials are used to make *jamu*, the traditional medicine. But it is not only in the developing world where there are problems. Germany, the largest European medicinal plant importer, is also a major exporter of finished herbal products, accounting for at least 70% of the European market.

A patent taken out by a US company in 1999 angered Indian scientists and ecology experts greatly. They were furious at what they considered to be the raiding of their country's storehouse of traditional knowledge.[37] The Americans were granted a patent on a composition of bitter gourd, eggplant and jamun, the fruit of the rose-apple tree, which is abundant all over India during the summer months. The use of these substances to treat diabetes dates back many centuries and is mentioned in many ancient texts on healing. Other indigenous Indian herbal products on which patents have been taken out include mustard seeds (used for bronchial and rheumatic complaints), Indian gooseberry (coughs, asthma, jaundice and wounds) and neem (pesticidal, dermatological and antibacterial properties). The last has attracted dozens of patent applications. It is probably the most celebrated medicinal tree in India.

A World Wide Fund for Nature (WWF) report warns that the enormous market demand could have an irreversible impact on many species unless action is taken to regulate trade,[38] e.g. the terpenoid taxol can be made semi-synthetically from one or more of the constituents of *Taxus baccata*, a yew tree that grows among pine forests at around 3000 m in the Himalayas. Taxol is of use in the treatment of ovarian and breast cancer. Pharmaceutical companies have stripped forest areas of this species and available trees in a bid to meet the demand for this drug. One cause of the problem was an earlier unconsidered arbitrary decimation of the yew tree population. In 1977 the plant was not considered important enough even to be included in a book on trees, but within 15 years it had become an endangered species.

According to a newspaper report, more South Africans are using traditional muti made from plants or animals, driving some species to extinction

and pushing up prices.[39] The traditional medicine trade in South Africa is a large and growing industry, the authors of the report said. There are 27 million consumers of traditional medicines and the trade contributes an estimated ZAR2.9bn (£0.23bn, €0.27bn, US$0.39bn) to the national economy. At least 771 plant species are known to be used for traditional medicine, including scarce species that fetch up to RAR4800 (£387, €441, US$637) a kilogram. It is estimated that 86% of the plant parts harvested will result in death of the plant with significant implications for the sustainability of supply.

The WWF report reviews the data available on medicinal plant trade and cites the urgent need for further investigation. One problem is that it is often difficult to decide whether the medicinal plant imports are derived from cultivated or wild specimens. Brazil, China and Nepal have conservation programmes, but India and Pakistan still harvest from the wild, and little is known of the ecological impact of such trade.

Climate changes

As well as the direct threat to plants from humans through their actions on the habitat or by exhausting the plant stock, there are other more natural factors such as climate, although it has to be said that this may well have been changed as a result of human action also. Scientific tests at Canberra's Australian National University have proved a link between stunted plant growth and higher ultraviolet radiation caused by depletion of the earth's protective ozone layer. This depletion is being caused by synthetic chemicals, especially chlorofluorocarbons (CFCs) found in products such as air-conditioners and foam packaging.[40] Since the late 1970s the use of CFCs has been heavily regulated. In 1990, diplomats met in London and voted to call for a complete elimination of CFCs by the year 2000. By the year 2010 CFCs should have been completely eliminated from developing countries as well.

Changes in climate from global warming as a result of the greenhouse effect are also important. However, it is unclear how long-term changes in the composition of the mix of atmospheric gases, soil structure, or pest and disease patterns will affect the capacity of plants to manufacture the important active principles for which we currently rely on them. There are some successes; after the increased use of natural gas and low-sulphur fuels, the amount of sulphur dioxide in the atmosphere has fallen. And some plants may adopt a different habitat, e.g. *Arnica montana* usually grows in alpine regions, but has been known to flourish in milder climates too.

At the same time, ammonia concentrations have risen, with the effect of changing the pH of rootwater and directly affecting the chances of plants to survive in some habitats.[41]

Tackling the problem

Awareness

In Britain, John Evelyn (1620–1706) was the first to warn about the fact that its native trees were disappearing faster than they could grow. Evelyn's *Sylva* published in 1664, became the tree growers' handbook for two centuries.[42] Collecting is a threat to some rare plants; others are affected by the trampling feet of hikers or climbers. At risk from this danger are plant species on the sea coast and hilly areas. The greatest number of endangered species (38) are those of lowland pasture, open grassland and other natural open habitats.[43] Examples of UK endangered or vulnerable species with herbal or homoeopathic applications include species of rock cinquefoil *(Potentilla rupestris*), Jersey cudweed *(Gnaphalium luteo-album*), gentians (*Gentians* spp.), rough marshmallow *(Althaea officinalis*) and purple spurge *(Euphorbia peplis*).

Working with local population

Perhaps the most important way to conserve resources is to work closely with the people who live in and use the forest, the indigenous population, rubber tappers, ranchers, loggers, etc. to strike a balance between the extremes of conservation and exploitation that will protect species and threatened environments while still fostering economic development and reducing poverty. Finding alternative uses for crops is one solution – the town of Aukre in Brazil is making money harvesting Brazil nut oil for the Body Shop set up by the late Anita Roddick.

Redevelopment

Another solution is finding use for the deforested areas. The return of large-scale cattle ranching is even a possibility, provided that grass can be grown for fodder, and programmes of continuing education to encourage better forestry management and appropriate legislation, such as the US Endangered Species Act 1973 and the British Wildlife and Countryside Act 1981. A total of 332 plants were either listed or proposed for listing, under the latter, from 1985 to 1991. It has been suggested that companies should fund forest protection schemes by putting cash up in exchange for exploitation rights. US$1m has been invested by an American drug company in a pilot scheme in Costa Rica. However, the costs are enormous, running into billions of dollars just to preserve resources solely for the pharmaceutical industry. Some of Britain's rarest wild flowers are likely to be encouraged to make a return as a result of an EC Set Aside scheme.[44] The reduction in the cropped area of over 450 thousand hectares between 1992 and 1993 was

mainly as a result of the impact of EC Set Aside schemes, which were established to reduce the amount of agricultural land in arable production. The first of these schemes, the Five-Year Scheme, was introduced in 1988. This scheme was superseded in 1992 by the Arable Area Payments Scheme (AAPS), which included a compulsory set-aside requirement except for the smallest farmers. A reduction in the area of land set aside in the UK in 1996–7 was generally attributed to the reduction in payments made to farmers under the Set Aside scheme; however, between 1998 and 1999 the amount of land set aside increased by over 250 000 hectares as a result of the reintroduction of the grants. Other agri-environment schemes make payments for the adoption of agricultural practices to conserve wildlife habitats, and historical, archaeological and landscape features, and to improve opportunities for countryside enjoyment. Support is also provided for a variety of capital works.

Strategic approach

The WHO launched its first-ever comprehensive traditional medicine strategy in 2002 (see earlier).

Plant alternatives

Chemical synthesis would cut down the amount of plant material consumed in extraction processes. Ideally, pharmaceutical companies require novel, single, active molecules that can be made in a laboratory. Although this may be possible for some allopathic drugs, the activity of most crude extracts can seldom be attributed to a single molecule, but is usually the result of several compounds acting in synergy, making production of synthetic copies extremely difficult. Medical herbalists are obliged to use the original source material to protect this unique mix of active principles. Furthermore, the holistic principles of herbal medicine suggest that the relative concentrations of useful plant chemicals achieved by mixing different species together in individualised prescriptions are important in treating patients despite the general lack of standardisation. We know little about the interactive abilities of naturally occurring chemicals, much to the consternation of our orthodox colleagues whose demands are for purified, fully characterised medicines given in regulated doses. Homoeopaths need to use naturally occurring source materials too, complete with any inherent impurities, so that modern drug pictures can be assumed to match exactly with Hahnemann's own work.

There is also the possibility of creating a problem of another kind by following the synthesis strategy. The isolation of the chemical diosgenin, from the Mexican *Dioscorea* species in the 1940s, led to a booming steroid

industry in that country. As sophisticated isolation, separation and elucidation techniques developed, the requirement for this particular raw material fell away completely and with it went the accompanying industry, causing widespread local social deprivation.

Dioscorea continues to be used by homoeopaths. There is some irony in the fact that the largest pharmaceutical companies in the world are scouring the South American rainforests increasingly, seeking natural sources for drug products.[45] Estimates of the 'hit' rate from random screening programmes vary widely, but are put between 1 in 1000 and 1 in 10 000. The chances of finding active plant extracts is greatly increased by studying the use of plants by various cultures, and the discipline of 'ethnobotany' is growing slowly. Table 1.1 lists a number of orthodox drugs that originally came to scientific attention as a result of ethnobotanical studies

Success story

Ginkgo biloba (Figure 1.3) is a unique survivor from the Jurassic dinosaur era some 190 million years ago; all of its related species have long since died out. The tree has survived in cultivation because of its valuable fruit and wood and possibly because it was planted in temples. It was introduced to Europe from its native China in 1730 and was heading for extinction until fortuitous intervention saved it. Extracts are used in Chinese herbalism under the name *baguo* to treat hypertension.

Table 1.1 Orthodox drugs derived from plants

Medicine	Plant
Atropine	*Atropa belladonna*
Cocaine	*Erythroxylum coca*
Colchicine	*Colchicum autumnale*
Digoxin	*Digitalis purpurea*
Ephedrine	*Ephedra sinica*
Hyoscyamine	*Hyoscymus niger*
Morphine	*Papaver somniferum*
Pilocarpine	*Pilocarpus jaborandi*
Quinine	*Cinchona legeriana*
Strychnine	*Strychnos nux vomica*
Theobromine	*Theobroma cacao*

It is no consolation that complementary practitioners are the cause of the problems, for our uses are but a fraction of the total requirements. It would be unforgivable if future generations were to suffer because remedies disappeared due to the actions of others. We must work out a compromise in plenty of time.

Figure 1.3 *Ginkgo biloba* tree.

More information

Botanic Gardens Conservation International: www.bgci.org

European Herbal and Traditional Medicine Practitioners Association: www. ehpa.eu

Further reading

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