1 Introduction

Drug use in developing countries is often characterised by excessive and inappropriate prescribing (WHO 1993). This exposes patients to the risk of ineffective treatment and adverse side effects, and contributes to unnecessarily high costs of medical care.

This article presents findings from a survey of drug use at health facilities in three poor rural counties in China, discusses the factors that affect drug use in these facilities, and concludes with a discussion of the implications of these findings for policy.

2 Content and Cost of Drug Prescriptions

This section presents the results of the prescription survey. It compares the average number of drug items per prescription, the proportion of prescriptions with antibiotics, the proportion of prescriptions with an injection, and average cost per prescription between the health facilities studied and with similar indicators from other countries. These comparisons provide a rough indication of the appropriateness of prescribing behaviour.

2.1 Contents of prescriptions

Table 1 shows the average number of drugs per prescription in the county hospitals and township health centres. Doctors prescribed fewer drugs per prescription in the former than in the latter. The average prescription size in all the study health facilities, except Xunyi's township health centres, was between two and three. These prescriptions were relatively large compared to those in many other developing countries (Gilson et al. 1993). The average number of drugs per prescription was particularly high in Xunyi's township health centres, where 43 per cent of prescriptions had more than four drugs.

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1 This is a shortened version of an article which will appear in a forthcoming issue of Tropical Doctor. The authors wish to acknowledge the assistance provided by Andreas Wilkes.

2 All three county hospitals and two township health centres from each county were included in the sample. The village health stations were not included, since they did not keep records of prescriptions. The total number of prescriptions analysed was 7,182. Prescriptions of Chinese herbs were not included in the study because of difficulties in assessment.
Between one third and one half of the prescriptions issued by most of the facilities and over half those issued by Xunyi's health centres included antibiotics. A substantial number of prescriptions included two or more antibiotics. The proportion of prescriptions by the study health facilities that included antibiotics was relatively high compared with many other developing countries (Gilson et al. 1993; Naja et al. 1988; Tipping et al. 1994).

Between a sixth and a quarter of prescriptions included an injection. These results lie in the upper-middle range in comparison with studies of other selected developing countries (Gilson et al. 1993; Naja et al. 1988; Tipping et al. 1994). A considerable number of Xunyi's outpatient prescriptions also included an intravenous drip.

### 2.2 Average cost of prescriptions

Table 2 presents the average cost of prescriptions in the health facilities surveyed. The lowest average cost of prescriptions (¥2.8) was found in the township health centres in Shibing, while the county hospital in Xunyi had the highest average cost (¥9.7). The average costs were higher in the county hospitals than in the township health centres. This probably reflects the different case mix at the county hospitals and the fact that a significant proportion of patients at these facilities were insured (Gu et al. 1995b).

In order to assess the financial burden placed on the rural population by drug fees, the average per capita daily disposable income was calculated, based on data for 1993 from the household survey. The aver-

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Content of prescriptions in the three study counties in China (1993)</th>
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<tbody>
<tr>
<td></td>
<td>Donglan county hospital</td>
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<tr>
<td>Av. no. of drug items</td>
<td>2.2</td>
</tr>
<tr>
<td>% of prescriptions with antibiotic(s)</td>
<td>47</td>
</tr>
<tr>
<td>% of prescriptions with injection</td>
<td>24</td>
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</table>

Source: 1994 prescription survey

<table>
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<th>Table 2</th>
<th>Average cost per prescription and average daily income per capita in the three study counties in China (1993)</th>
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<tbody>
<tr>
<td></td>
<td>Donglan county hospital</td>
</tr>
<tr>
<td>Av. cost per prescription</td>
<td>5.7</td>
</tr>
<tr>
<td>Av. daily income per capita</td>
<td>1.72</td>
</tr>
</tbody>
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Note: In 1993 US$ 1 was equal to approximately ¥5.76
Sources: 1994 prescription survey and household survey
Unit: Yuan
average cost per prescription in the township health centres was equal to 2.9, 2.1 and 4.8 times the average per capita daily income in Donglan, Shibing and Xunyi, respectively. The average cost of prescriptions in the county hospitals was even higher. These costs were higher than those reported for Indonesia during the early 1980s where the average cost of a health centre visit was equivalent to one day's per capita income (Meesook 1983).

3 Factors Influencing Drug Use
This section discusses the influence on prescribing behaviour of the system of government health finance, regulation, training and monitoring, and users' attitudes and behaviour.

3.1 Government health care finance
The government's health care finance system strongly influences drug use. Health facilities depend on revenue from user charges, including drug sales and, to a lesser extent, medical examination fees. Almost every health facility in China has a pharmacy that sells Western drugs and/or manufactured Chinese drugs as well as Chinese herbs. They charge a mark-up of 15 per cent on Western and Chinese manufactured drugs and 20 per cent on Chinese herbs. This encourages high levels of sales. Revenue generated from user charges is used for health facility maintenance and development and staff remuneration. Salaries are fixed by the central government. However, health workers are paid bonuses by their employer. The more revenue a health facility generates, the larger the bonuses it can pay. This provides an incentive for individual health workers to prescribe more items, particularly of expensive products.

3.2 Regulation, training and monitoring
Prior to the economic reforms, the rural health services operated a de facto essential drugs policy. Figure 1 shows the structure of the system of drugs supply prior to the reforms. Almost all drugs were manufactured by the State Pharmaceutical Company and distributed through a chain of monopoly suppliers. The local drug companies tended to provide only a small number of basic drugs to the lower level facilities.

The transition from a centrally planned to a market-oriented economy has been accompanied by a shift to a largely unregulated market for drugs. Drug manufacturers and suppliers now supply products to whoever can pay for them. Indeed, drug companies are expected to maximise revenue and/or profits, a motivation which was confirmed in interviews with the directors of drug companies. They are under pressure to generate as much turnover as possible.

Drug producers and drug companies employ a variety of strategies to increase sales (Dong and Zhan 1995). Some of them supply directly to the pharmaceutical departments of health facilities. Many offer commissions to those in charge of drug purchasing, and some offer bonuses to doctors who use new and expensive drugs.

Health facilities in the study counties still procure mainly (but not exclusively) from the county drug company. These companies obtain drugs from more sources than previously. Since health facilities (including village health stations) can procure drugs from a variety of sources, it is not possible to prevent them from obtaining and selling any drug they wish.

The majority of health workers in health centres in poor townships have not graduated from medical college or university, and many have received no formal medical training at all (Gong and Wilkes 1997). There are, nevertheless, almost no limitations on the drugs they can prescribe and sell. This also applies to village doctors, who are part-time farmers and health workers (Deng et al. 1997). Many people purchase drugs without seeing a health worker at all (between 44.5 per cent in Donglan and 82.6 per cent in Shibing). The most common sources of supply are health facilities, pharmacies, and the offices of private doctors. In some areas, even veterinarians sell drugs for human use, according to the director of one county health bureau. This demonstrates the almost complete lack of regulation of drug sales.

Basic indicators of the quality of care provided by health facilities are included in the routine reports submitted by hospitals and health centres to county health bureaux. However, county health bureaux do
not monitor the performance of health workers, including their use of drugs, unless a medical accident occurs. One reason for the lack of effective regulation is that many county health bureaux do not employ staff capable of monitoring the technical aspects of services. Even more significantly, neither the county health bureaux nor the county hospitals have any incentive to monitor the quality of services, since the government does not allocate funds for this purpose.

3.3 Users’ attitudes and behaviour
Guo (forthcoming) has studied the influence of social factors on prescribing behaviour in the study counties through interviews and focus group discussions. He found that many peasants prefer doctors who prescribe several drugs. They also commonly believe that imported drugs are better than locally produced ones, injections are better than tablets, and expensive drugs better than cheap ones. Many drugs are widely advertised through television, newspapers and magazines. These advertisements, which do not mention potential side effects, appear to influence user preferences and consequently prescribing behaviour. Guo reports that nine per cent of patients requested a specific drug when consulting a health worker.

Poor households find drugs very expensive, and are sometimes reluctant to seek treatment if they fall ill (Yu et al. 1997). Some health workers in the study counties reported that patients bring small amounts of money and ask doctors to prescribe drugs which will cost less than that amount.

4 Conclusions
A number of factors have contributed to the inappropriate use of drugs. Many health workers have had relatively little training. Until the early to mid 1980s many of them had only used a small number of basic drugs. They have had almost no in-service training since that time. As a result, many health workers are prescribing products about which they have had almost no formal training. Their use of these drugs is virtually unsupervised.

The income of health workers is directly related to the volume of drugs they sell. One option for decreasing the pressure to increase sales would be to cut the link between the remuneration of health personnel and drug sales (Gu et al. 1995a). One possible method could be to separate pharmacies from health facilities, as in some other countries. Such a policy would have to be accompanied by the
development of alternative financing mechanisms for health facilities. Some of the more affluent villages, for example, pay their village doctors a salary and the profits from drug sales are paid directly into the village welfare fund. Many areas, however, may not be able to maintain adequate levels of funding for health facilities without the revenue from drug sales.

Another option would be to limit the right to prescribe and sell certain products to those with defined levels of training. All health workers would be permitted to sell unregulated drugs freely at a price that includes a profit margin. Other drugs would only be prescribed and sold by licensed personnel. One strategy for limiting the incentive to prescribe costly products would be to set a fixed dispensing fee per prescription of regulated products.

A background paper reported in WDR93, Investing in Health, ranked China fairly low in terms of annual drug expenditure per capita. Nonetheless, many people feel that drugs are too expensive in China. The cost of outpatient visits has become a barrier to access to care for the poor (Tang et al. 1994; Gu et al. 1995; Luo et al. 1995). There are reports of poor patients who cannot afford a full course of prescribed drugs. This is not surprising since an outpatient visit costs around half the average income per capita per week. This underlines the need to include measures to improve drug use in a programme of reforms aimed at providing the population with access to effective care at reasonable cost.

References


Luo, W. J. et al., 1995, ‘Study of health financing and organisation in poor rural areas of China’, paper presented at the IHPP Research, Writing and Dissemination Workshop, Washington, DC, 1-9 March


