

## Antimicrobial resistance: the importance of developing long-term policy

*Sir* – I read with great interest the recent paper by Fasehun, concerning antimicrobial use and resistance across 16 countries in the six WHO regions (1). Resistance to antimicrobials is without doubt one of the biggest challenges to face public health as we move towards the new millennium, and studies concerning the use of antimicrobials, the spread of resistance, and the financial and health impacts of resistance are urgently required. Papers such as that by Fasehun are thus a vital part in the process of gathering and disseminating information concerning these factors.

Yet, the danger is that such papers, perhaps by virtue of data availability, take a somewhat narrow focus. Fasehun's paper, for example, does not consider the wider health service costs, nor (perhaps more importantly) the wider societal costs on families and on the economy, all of which will rise as first-line therapies fail. Furthermore, the paper is concerned with a cross-sectional examination through time across the 16 countries, with no examination of the potential future cost and health impact which the current lack of availability of reserve antimicrobial drugs might cause.

Fasehun's paper thus highlights the "missing link" in addressing antimicrobial resistance: a comprehensive model considering the long-term impact that resistance, and specifically failure to tackle resistance, will have. Fasehun highlights the fact that of the countries considered, the restricted antimicrobials, used to combat resistance, have a less than 40% chance of being used, with vancomycin only a 12% chance. Yet the pressing issue is not so much the impact that this has on health care budgets now, but how such continued lack of following an "optimal" mix of antimicrobial availability and use will impact in the future. Although information on the current cost and health impact of resistance is important in its own right, its ultimate value lies in the development of a comprehensive model of the long-term impact of resistance, how this is affected by

current antimicrobial use, and how it may alter with various changes to future use and environmental factors. Development of such a model needs to be high on the policy and research agenda, as it is critical to the long-term management of antimicrobial use in two ways.

- First, it will enable estimates of the costs of resistance to be incorporated into economic evaluations of new antimicrobials, or of new uses for existing ones. In the absence of such information, current economic evaluations are wrongly specifying the true cost of antimicrobial usage (2).
- Second, a model enabling assessment of the optimal use of antimicrobial drugs is essential to developing viable policy alternatives (3).

In terms of policy, Fasehun raises the importance of improved education and hygiene in the prevention of resistance. Although this will reduce the development and/or spread of resistance, complete prevention is unachievable, and it is policy for the *management* of resistance that therefore needs to be developed. For this, financial means and incentives will be an important element in developing a sustainable policy (4). For example, the cost of maintaining the full range of drugs required to control resistance is indicated by Fasehun as a possible cause of few countries having the reserve drugs required. Fasehun also identifies the lack of a financial base to develop laboratory facilities to test for resistance susceptibility as important, and of course education itself may be resource intensive. Any developments in terms of policy must therefore recognize the importance of providing a sufficient financial base for proposals, or to work around the limited resource availability in different countries. However, given that resistance is very much a global issue, there is undoubtedly a strong case to be made for the developed world to assist developing nations in meeting policies which might require increased resource utilization. Overall, it is vital that the short-term budgetary pressure bullet is bitten if we are not to end up with an overwhelming

human and financial crisis in the not too distant future. ■

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## Towards safe management of health care waste in Bangalore City

*Sir* – Waste from health care facilities is handled very haphazardly in most developing countries. Bangalore City, with its population of more than five million, is no exception. From a daily total in the region of 2000 tonnes of solid waste, approximately 12 500 kg of health care waste are generated from 25 000 beds in hospitals and nursing homes and 1000 kg from some 5000 general practitioners.

The Department of Community Medicine of the MS Ramaiah Medical College, in an attempt to raise community awareness of the problem, undertook an in-depth study of waste disposal practices in health care facilities. After a literature search — which revealed information mostly inapplicable to the Indian situation — and consultations with experts, a pre-tested questionnaire was sent to 240 health care facilities; 84 replies

were received (a response rate of 35%), as follows:

general practitioners or family clinics	40
private nursing homes and private hospitals	11
city corporation dispensaries	10
city corporation maternity homes	8
medical college hospitals	4
primary health centres	4
clinical laboratories and blood banks	4
dental clinics	3

None of the health care settings had a sanitary waste management facility; however, 85% were managing body fluid spills satisfactorily, 35% were using covered waste containers, and 20% were safely managing the organic waste. Incinerators were used in 10% of the settings, but they did not meet specified standards or guidelines and contributed to pollution. Sharps were casually disposed of in 80% of the facilities. Where health care waste was separated (in 20% of facilities) it was ultimately mixed up with other solid waste, thus negating the efforts made. As far as preventive activities were concerned, 75% of respondents were not using protective devices, 18% used only gloves, and the application of disinfectant was left to untrained helpers so the concentration of the solution and its use were often unsatisfactory. Pre-recruitment and periodic health examinations for personnel were practised in 10% of the responding facilities.

The problems outlined below were also identified.

- General practitioner clinics are located throughout the city. Though the quantity of waste generated by them is small, if infectious it could contaminate the entire municipal waste collection unless properly disposed of.
- There is no existing system for the treatment of waste within health care

settings or for its safe transport to a waste management facility.

- Personnel generating or handling waste have received no specific information or training; this is reflected in poor handling and management methods and lack of essential precautions against the transmission of disease.
- Single-use needles and syringes are being reused or repacked and sold illegally. In Bangalore City, plastic waste is sold for US\$ 0.25–0.30 per kg.

There is a need for an integrated approach to the safe management of health care waste, with coordination between health care settings and civic authorities for procedures that go beyond its mere collection. The question is insufficiently addressed because it can raise emotional and apparently ethical concerns. It is worth noting that only 15% of such waste needs to be strictly regulated; the remaining 85% can be handled through the existing system for the disposal of general municipal solid waste. No single method is ideal for the ultimate disposal of health care waste, which must take account of the scarcity of resources. The biomedical waste (handling and management) section of the Environment Protection Act 1986 makes a start towards codifying and streamlining the disposal system.

The Health Care Waste Management Cell has been set up in the Department of Community Medicine at the MS Ramaiah Medical College, Bangalore, to create a network of activities and to serve as a resource centre for training, research and information dissemination. We have initiated a newsletter, Safe Management of Health Care Waste, to provide a platform for dialogue and the sharing of possible solutions among personnel in health care settings.

Among the activities of the Cell so far, field testing has been completed for draft information and training units for different categories of health care personnel; 30

institutions have volunteered to test the modular training manual; and two pilot projects have been initiated to demonstrate and document health care waste management in a defined geographical area in the city of Bangalore. This geographical ward approach is planned to serve as a model that can be replicated and expanded. ■

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