

LETTERS TO THE EDITOR

Economic burden of communicable disease outbreak in a military unit

SIR – We report the results of a survey aimed at calculating the economic impact of an outbreak of an unknown communicable disease agent among a British artillery regiment undergoing a field training exercise. The outbreak took place in July 1993 around Hackenberg in the Moselle region of Germany and was of a self limiting nature. The illness, 21 cases centred around a subunit of the regiment, was characterised by sudden onset of vomiting, malaise, and fever. Symptoms subsided with conservative treatment after 24 hours.

Despite extensive investigations and tests we were unable to identify the cause. The epidemic curve, however, was typical of a point source outbreak.

We itemised costs by administering a prepared questionnaire based on a modified version used by two of us (TOJ and VD) to estimate the economic burden of Salmonellosis in the northern Italian region of Emilia. Parts of the questionnaire had been further refined on the basis of the work by Roberts and Sockett¹ and by Harrington.²

The first part of the questionnaire lists all expenses incurred by the casualty on an individual or family basis and resources used by the army as an employer. This enabled us to calculate direct costs (treatment) indirect tangible costs (loss of output), and indirect intangible costs (loss of leisure; grief, pain and suffering). The cost of these last items was estimated by using a "willingness to pay" approach. Casualties of the outbreak were asked what percentage of their gross annual income they would be willing to pay annually to reduce the overall chance of experiencing the same symptoms again by 10%. The second section of the questionnaire lists and itemises outbreak control costs.

After itemisation, all resources were costed using Ministry of Defence capitation and other rates. To estimate the sensitivity of our

results to marginal theory, we abated direct and indirect costs by 20% to estimate their marginal value to the German NHS (direct costs) and to the army (loss of output) as the operational efficiency of the subunit was degraded during the outbreak by 20%. In the second scenario, average costs only were taken into consideration because to the army direct costs represent full additional costs as little use was made of army medical facilities in Germany and loss of output may have been considered 100% as reinforcements had to be brought in.

The low indirect intangible estimate was achieved by repeating the original willingness to pay question on the study population three months after the outbreak had taken place. We thus obtained 0.3% against the original 2.1%.

Outbreak control costs in the low estimate were abated by 50% to estimate their marginal value to the army. Our findings are summarised in the table.

The cost per case in both our estimates is higher than that estimated in UK by Sockett and Roberts for the 1988–89 cases of Salmonellosis (£788). A possible explanation for this finding may be the relative outbreak control expenses due to the field conditions of the setting. The bulk of the direct costs are the expenses of admitting all cases to the Hackenberg hospital, where the accounting system probably reflects a proportion of running costs.

Additionally, the main item of our high costs is represented by the estimate for the cost of pain, grief, and suffering (£381 per case or 33% of total costs in the high estimate.) Although the method we used to estimate this is a new application of the willingness to pay approach, we have no reason to believe that the soldiers we interviewed failed to comprehend the significance of the relative question. The apparent dimming effect of time on soldiers' recollection of discomfort supports our impression.

The advantages of this approach are many. It is a simple and direct expression of personal preference which can be used in resource allocation equations and is currently being developed in other settings, such as road traffic accidents (Jones-Lee, personal communication). Our estimates (2.1% to 0.3% of gross annual income) are based on small numbers of interviewees and the risk decrease was fixed, which did not allow elasticities to be explored. Although indirect intangible costs have long been recognised as a very important part of the costs of disease, very few studies have tried to reach a set of estimates.

We believe that previous estimates of pain,

grief, and suffering used, among others, by us in economic studies of Salmonellosis³ and hepatitis A and B vaccination^{4,5} and based on Department of Transport estimates relating to road traffic accidents are no better than a rough estimate. Repeated studies are required using a willingness to pay approach across a range of conditions in different settings in order to reach credible estimates.

Finally, the Hackenberg outbreak was a relatively "cheap" outbreak as it involved only single men. In a community outbreak, involvement of families and welfare support services in the absence of an extended family would increase the costs considerably.

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- 1 Sockett PN, Roberts JA. The social and economic impact of salmonellosis. A report of a national survey in England and Wales of laboratory-confirmed salmonella infections. *Epidemiol Infect* 1991;107:335–17.
- 2 Harrington W, Krupnick AJ, Spofford WO. *Economics and episodic disease. The benefits of preventing a Giardiasis outbreak*. Washington DC: Resources for the future, 1991.
- 3 Demicheli V, Jefferson TO. Le conseguenze economiche della salmonellosi. *Antibiototerapia per la pratica* 1991;2:73–81.
- 4 Jefferson TO, Demicheli V, Wright DH. An economic evaluation of the introduction of vaccination against hepatitis A in a peace-keeping operation. The case of the United Nations Protection Force in Yugoslavia (UNPROFOR). *International Journal of Technology Assessment in Health Care* 1994 (in press).
- 5 Demicheli V, Jefferson TO. Cost-benefit analysis of the introduction of mass vaccination against hepatitis B in Italy. *J Public Health Med* 1992;14:367–75.

Randomised controlled trials

SIR — The report of the Cochrane lecture in the February journal¹ highlights the sort of substantive and methodological difficulties which are referred to in the editorial of the same edition.² It is very rare to hear anyone involved in public health research of any kind discuss the epistemology of the research methods they use, or the ontological assumptions underlying them. It is quite easy to gain an unwarranted reputation as a methodological bore, if one draws attention to the methodological limitations of the proposed projects of one's colleagues or "flavour of the month" research topics (outcomes for example). In my, admittedly limited, experience among those who work in the field of public health (at least, or perhaps especially among those who have a medical background) the randomised controlled trial (RCT), which Professor McPherson appears to hold in such high esteem, is held as the gold standard to which all research should aspire, and be compared (usually unfavourably).

Public health as a discipline is almost entirely oriented to quantitative research methods, the apotheosis of which is the RCT.

Direct and indirect costs of the outbreak by estimate and item

	Estimate			
	High		Low	
	Value (£)	(%)	Value (£)	(%)
Direct costs				
Care of cases	6837	(28.0)	5466	(44.4)
Outbreak control cost				
Env. health team	1559	(6.4)	744	(6.0)
Unit	3865	(16.1)	1932	(15.7)
Total direct costs	12 261	(51.1)	8142	(66.2)
Indirect tangible costs:				
Loss of output	3725	15.5	2980	(24.2)
Indirect intangible costs:				
8006		33.4	1143	(9.3)
Total indirect costs	11 731	48.9	4123	(33.5)
Grand total	23 982	100.0	12 265	(100.0)
Cost per case	1142		584	

Professor McPherson argues that public health research should increasingly involve the use of the RCT. This is however a questionable argument. Quantitative research methods as a whole, including the RCT, are based on the ontological assumptions that underpin the natural sciences, ie. that there is some absolute unchanging reality that lies behind appearances, and that there is a method by which we can gain knowledge of that reality.

I would suggest that this assumption is untenable in the field of medical outcome research. Humans are not lifeless atoms, or mere animals, that just react to stimulation or intervention in a set pattern, repeated on every occasion. All medical outcomes are at least partly due to situated subjective factors, both in the intervention itself and in the patient. This is the cause of part of the uncertainty in medical practice to which Professor McPherson refers. While agreeing that this is a predominant, yet unrecognised characteristic in all medicine, contrary to his argument I would suggest that the RCT does not necessarily eliminate this with any more certainty than any other methodological approach. It is the ontological assumption – that there is one absolute “objective” certainty to be found, that is not subjective or situated in the individual—which is flawed.

This is not to suggest that an absolute relativist position should be accepted, nor that high quality well designed RCTs should not be carried out. Neither does it suggest that quantitative survey research methods do not have an important contribution to make to outcomes research. The research methods adopted should be those most appropriate both in terms of their ability to provide answers to the research question(s) posed, and the context in which they are to be used. Studies of the outcomes of medical interventions should seek to systematically validate data by “triangulation” of the said data through the use of as many different sources of data as possible. No one source should be considered definitive in providing “the objective truth” in answer to the question of which intervention is the most effective.

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- 1 McPherson K. The best and the enemy of the good: randomised controlled trials, uncertainty and assessing the role of patient choice in medical decision making. *J Epidemiol Community Health* 1994;48:6–15.
- 2 Editorial. The philosophical foundations of public health: an invitation to debate. *J Epidemiol Community Health* 1994;48:1–3.

NOTICES

Tuberculosis—Sign of the Times? Royal College of Nursing Tuberculosis Visitors Forum Conference, 26 October 1944, Westminster Central Hall, London SW1. RCN members £45; non-members £60. Topics include: drugs and drug resistance; tuberculosis and nursing lessons from Romania; tuberculosis HIV/AIDS; tuberculosis and its relation to humans. Application from: Sandra Treadwell, 071-409 3333.

Commercializing Biomedical Technologies: Effective Collaboration Between Research Institutions and Industry, Fourth Annual International Conference, 7–9 November 194, Boston, USA. For information, contact: Harvard School of Public Health, Office of Continuing Education, 677 Huntington Ave, LL 23, Boston, MA 02115-6023, USA. Tel: 617-432-1171; fax 617-432-1969.

BOOK REVIEWS

Drugs Policy in Developing Countries.

By Najmi Kanji, Anita Harden, Jan Willem Harmmeijer, Masuma Mamdani, and Gill Walt. (Pp148; Hardback £29.95/\$49.95, Paperback £11.95/\$19.95) London and New Jersey: Zed Books, 1992. ISBN 1-85649-059-9 Hb and 1-85649-060-2 Pb.

This book is published with the support of the Danish International Development Agency (DANIDA), which has been a major source of finance and support for the Drugs Action Programme (DAP) of the World Health Organisation.

The authors, with practical experience in developing countries, give an account of the development of and changes in the policies of WHO, UNICEF and other agencies, and of the actions of drug manufacturing companies and of the governments of individual countries, in relation to the supply of medicines.

In many developing countries one can see expensive and inappropriate medicines on sale to the public while health units do not have enough basic supplies to treat common illnesses. Parents may be persuaded to spend scarce money on ineffective proprietary “tonics” when they would be better to buy good food for their undernourished children. Dye-containing pills have been advertised to cure nearly every ill—one can see the poisons leaving the body with the coloured urine which results!

Within more “respectable” medicine, enormous price differences between supplies of the same drug from different sources greatly affect the number of people who can be treated from a limited budget. A proprietary drug against intestinal worms may cost £3 for a course of six tablets, where the same drug from a “generic” source, with no brand name, costs £10 for 1000 tablets.

Too many competing drugs with similar uses, including new and more expensive alternatives to existing medicines, also increase costs. Essential drug lists and limited drug lists are means to cut costs and simplify prescribing.

Such means are also useful in richer countries. A successful scheme in a hospital in Dundee, Scotland, allowed doctors to prescribe listed drugs without having to justify each prescription. They could prescribe other drugs but had to write why on the prescription form.

Drug manufacturers argue that they cannot stay in business unless they make profits, and they must cover research costs if they are to discover and test new drugs.

It is an irony that new and effective drugs are often available for veterinary use before they can be used in humans. Ivermectin, an effective drug against parasitic roundworms

and arthropods, widely used in veterinary medicine, is not yet licensed for general use in humans. But Merck Sharp and Dohme, the makers, have since 1987 supplied it free to WHO for use against onchocerciasis, a debilitating worm infection in parts of Africa and Central America.

Not all of these points are covered in this book, but it gives a good background to the politics and economics of medicine supplies for less wealthy countries – which is relevant to all countries. It should be widely read by those concerned to find solutions to these problems.

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Multiple Risk Factors in Cardiovascular Disease. Eds AM Gotto, C Lenfant, R Paoletti, and M Soma, (pp268; £61.50). Dordrecht: Kluwer Academic Publishers, 1992. ISBN 0-7923-1938-9.

This book reprints 35 papers from those presented at the First International Symposium on Multiple Risk Factors in Cardiovascular Disease (Washington DC, 1990). The editors have attempted to select papers which fit, probably in retrospect, a number of linked themes: the epidemiological evidence for co-segregation and interaction of individual risk factors; the evidence supporting the role of insulin resistance as an explanatory and unifying mechanism for some of this clustering; the therapeutic implications of “treating the cardiovascular risk profile”, rather than individual factors; and the epidemiological and other evidence for the independent risk factors status of candidates that are old (hypertriglyceridaemia), middle-aged (renin), and newborn (lipoprotein(a)).

Primary prevention is dealt with in a perfunctory way in a chapter dealing with the effects of health related behavioural changes on HDL-cholesterol and triglyceride levels. Primary prevention of hypertension is dealt with only in passing in chapters dealing with the prevalence, development, pathophysiology and the treatment of this disorder, thus the book is definitely oriented towards the clinical rather than the population epidemiology of cardiovascular disease.

This field is replete with kite-flying or, more charitably, strong conjecture. Laragh, for example, attempts to substantiate his long held conjecture that it is plasma renin (producing angiotensin II) rather than hypertension *per se* which is important for vascular damage and its fatal sequelae. He nearly succeeds. Williams, however, fails to make a case for specific anti-hypertensive therapy, tailored to biochemical profiles. Though, as he states, hypertension is probably not a unitary disorder, we nevertheless have only the randomised controlled trials to guide a choice of therapy—thereotically favoured therapies are mere conjectures, useful as that, but no more than that.

All the authors are, generally, clear and efficient in presenting their reviews and arguing their different cases; the review by Reavan on syndrome X is especially useful and persuasive. In short, this book is required reading in this rapidly changing field, though for specialists only.

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