

Comparative costs of mobile and fixed-clinic primary health care services

J. J. Dyer

With restructuring and rationalisation of health services in South Africa imminent, the development of methods for comparing and evaluating health services is of great importance at both national and local level, including comparisons of cost-efficiency and cost-effectiveness. The costs of different methods of delivering primary health care in a local authority through mobile and fixed-clinic services have been analysed and aspects of their cost-efficiency compared. The information gained from such an analysis can be used for management purposes to optimise both the use of resources and the quality of service provided at local level.

S Afr Med J 1996; **86**: 528-530.

In attempting to address South Africans' need for primary health care (PHC) services, the 'mobile clinic' has been widely used to provide services to small towns and rural areas. Information on the costs of this type of service relative to a fixed-clinic service is lacking, but if expansion and rationalisation of PHC services is to take place the cost implications of different methods of delivery, and the ability to compare their cost-efficiency and cost-effectiveness, are vital. Further aspects to consider are the acceptability and availability of these services, quality of care provided and their effectiveness in producing changes in health status.

The Development and Services Board (DSB) provides local authority services to over 80 areas of Natal, including small towns, rural areas and informal settlements. PHC nursing services are provided in twenty of these areas, either through mobile clinics, part-time fixed clinics or full-time fixed clinics. The cost-efficiency of mobile clinics is generally difficult to analyse in public health services, as it is difficult to identify the costs involved for each individual point. The DSB has, however, a financial system whereby services provided in each area are accounted individually, and detailed information on costs of health services to each delivery point is readily available. This enables costs of different types of service to be compared, which is important when deciding the most appropriate type of service for an area. Previous analyses of the costs of mobile services in South Africa, and comparisons with fixed clinics, have not been seen in the literature as research has focused on costs of hospital and community health centre services.¹⁻⁴

Studies performed abroad have generally focused either on overall cost analyses of national or regional programmes, or of community health worker programmes.⁵⁻⁷

Costs of mobile services are affected by, *inter alia*, the frequency of visits, numbers of staff, distances travelled and numbers of patients seen. However, these factors also affect the quality and effectiveness of the services provided, indicators of which are difficult to obtain; health status indicators are affected by so many external variables that it is almost impossible to correlate them with, for example, the provision of a monthly mobile clinic service. Given these difficulties, throughput measures (process measures) are often cited to give an idea of effectiveness of health care.⁸

Information about the costs of South African PHC services is often given on the basis of cost per patient consultation. It is suggested that information presented only in this form may give the appearance of a cost-efficient service in situations where patient numbers are high and staff numbers inadequate, thus hiding the fact that this service is of poor quality, where the time spent with each patient is severely limited and the effectiveness of the service reduced. Therefore while cost per consultation may indicate cost-efficiency, a better comparative measure — and perhaps a throughput measure that comes closer to being an indicator of cost-effectiveness — may be to look at cost per minute consultation if the assumption is made that a longer consultation is more effective than a short one. This assumption may be disputed, but it is suggested that, in a PHC service, the time available for health education, discussion and advice to patients may be more important than time taken to dispense medication.

Method

The total annual running costs of the services were calculated from the 1992/93 statements of income and expenditure provided by the finance branch of the DSB. These include, for mobile clinic services, the total staff costs (including salaries, benefits and subsistence payments), transport costs, medicines, furniture, equipment and value-added tax. For fixed clinics the costs of electricity, stationery, water, sanitation, refuse removal, repairs and maintenance of buildings and furniture, telephones and sundries were also included. Other studies have highlighted problems in obtaining the prices and costs of goods in a public service setting, given geographical and functional separation of financial and service sectors.⁹ Because of the particular accounting system of the DSB, these problems were not encountered in this study.

Excluded from the study were capital costs of fixed clinics and mobile vehicles, the cost of time spent by head office staff on administration, and rental income. Also excluded were four mobile points which operated irregularly.

The numbers of patients seen were taken from routinely collected statistics for the same period.

The time available for consultation (in minutes) was calculated by assessing the total time available (taking into account the number of nursing staff and days and hours of operation of fixed clinics, frequency of visits, time spent packing and unpacking the vehicle and travelling by mobile clinics) and dividing it by the number of patients seen for all services offered.

PO Box 224, Cato Ridge, 3680

J. J. Dyer, M.B. CH.B., D.T.M.&H., F.F.C.H. (S.A.), M.MED. (COMM. HEALTH)

Table I. Analysis of costs of services provided by mobile and fixed clinics, 1992/93

Service type	Service point	Total consultations	Cost of service (R)	Cost per consultation (R)	Minutes available per consultation	Cost per minute consultation (R)
Mobile vehicle	a	9 274	37 076	4.00	4.4	0.92
	b	4 867	20 458	4.20	4.7	0.90
	c	3 049	15 655	5.13	4.1	1.25
	d	2 876	17 859	6.21	4.8	1.29
	e	1 404	10 558	7.51	5.1	1.50
	f	2 088	16 685	7.90	5.2	1.52
	g	2 216	32 408	14.62	10.4	1.41
	h	3 124	14 163	4.50	4.6	0.98
Mobile service — fixed clinic	i	7 731	33 383	4.31	2.6	1.66
	j	10 505	87 227	8.30	3.0	2.77
	k	22 951	111 917	4.80	3.4	1.40
	l	4 876	20 942	4.20	2.6	1.60
Fixed clinic — part-time	m	7 657	67 859	8.86	5.7	1.55
	n	19 359	92 488	4.78	8.5	0.56
Fixed clinic — full-time	o	37 009	343 707	9.28	11.9	0.78
	p	11 378	185 239	16.28	19.0	0.86

Results

The costs of rendering the mobile and fixed clinic services are shown in Table I. Service types are divided into four categories: (i) mobile clinic points using only a mobile clinic vehicle; (ii) mobile points operating from a fixed clinic building owned by the DSB; (iii) fixed clinics operating on a part-time basis; and (iv) fixed clinics operating full time.

Certain trends become apparent from an examination of this table. With the exception of mobile point 'g' (for which there is a long travelling distance that adds to costs, and relatively low patient numbers for the frequency of the service), costs per consultation tended to be higher in the fixed, full-time clinics. However, no definite conclusion can be drawn regarding the costs per consultation for mobile services compared with fixed clinics, as the costs were lower at some fixed clinics than at some mobile points.

The minutes available for consultation show more obvious trends. Time was least for the mobile service which travelled to a fixed clinic building — only 2.6 - 3.4 minutes per consultation — followed by the mobile points, and highest for the fixed clinics — both part-time and full time (with the exception again of point 'g'). For mobile services, much time is spent preparing and packing the vehicle and travelling to the point, so that only 4 - 5 hours in a day are available for patient consultations compared with 8 in the fixed clinics. This suggests, therefore, that the fixed clinic offers a higher-quality service. The few minutes available at the mobile services operating out of fixed clinics may be as a result of high attendances — a fixed clinic building is possibly more attractive to clients than waiting at an open mobile point — combined with the time constraints of a mobile service as mentioned above.

Certain trends are also apparent from the analysis of cost per minute consultation. The highest costs tend to be for the mobile service operating out of a fixed clinic. This may be because there are both the negative features of high subsistence/travelling costs and the costs of running and maintaining a clinic building. The lowest costs per minute consultation are for the fixed, full-time clinics. Hence, while it may appear from an analysis of cost per consultation only that fixed clinics are more expensive, because the time

available for consultation is greater they may in fact be offering a more cost-effective service if it is assumed that spending 12 - 19 minutes with a client will have a greater positive effect on their health than a 4 - 5-minute consultation at a mobile point.

An alternative comparison of costs of different types of services is shown in Fig. 1. Here, for each of the four types, average costs have been broken down into categories which might be considered 'productive' and 'unproductive', the former being those costs that are directly beneficial to patient care (nurses' time, medicines, stationery) and the latter those unavoidable expenses that are incurred in the running of the service, but do not contribute directly to the care of the client: wage-earning staff (cleaners, drivers), clinic running costs (electricity, water and other services, furniture, equipment, repairs and maintenance), subsistence, transport and value-added tax.

It is evident that the service in which the greatest proportion of expenditure is on those aspects that directly benefit patient care is the fixed full-time clinic (84.8%), with a similar proportion at the part-time clinic (83.8%); the service with the lowest proportion of expenditure on such productive expenses is the mobile clinic that travels to a fixed clinic building (71.8%).

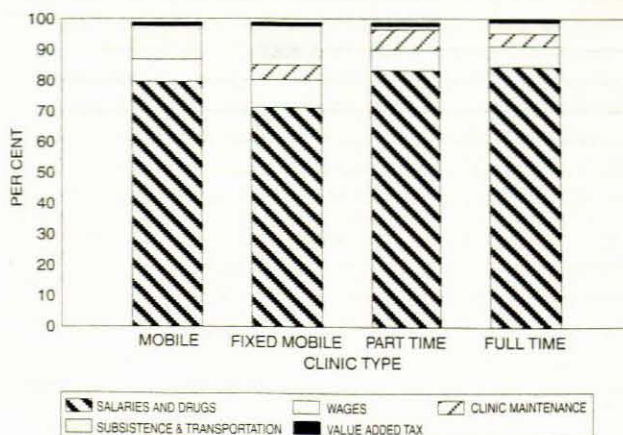


Fig. 1. Comparative costs of PHC services.

Discussion

These results illustrate alternative ways in which costs of different types of PHC services at a local level can be analysed and compared for management purposes. While it may be preferable to be able to compare PHC programmes on the basis of improvements in social welfare or health status, it is generally more practical to focus on programme processes or activities.¹⁰

The information obtained suggests possible options for the improvement of the cost-efficiency and possibly effectiveness of our services. For example, the change in the mode of operation of service 'k', a mobile clinic operating from a fixed clinic, to a mode like that of service 'n' (with similar numbers of attenders) which operates on a part-time basis, with staff resident in the area, might result in savings of R10 000 - 20 000 per year with a consequent reduction in cost per consultation. It may increase markedly the time available per consultation and result in a significant reduction in cost per minute consultation. Changing the mode of operation of service 'i' to that of service 'm' would increase the overall cost, but with only 2.6 minutes available per consultation it appears that insufficient resources are being channelled towards this service point. Overall costs may increase, but the time available per client would also increase markedly and the cost per minute consultation might improve, indicating an improvement in the quality and possibly the cost-effectiveness of the service.

Service 'p', with 19 minutes available per consultation and a high cost per consultation, may be overstaffed and could be more efficiently run if staff hours were reduced and they were employed on a part-time basis. However, were it possible to maintain the overall level of expenditure, this clinic appears to offer a high-quality service in terms of time available per consultation, with the cost per minute consultation quite low. It is unlikely that a full 19 minutes are spent with each client and there may be some unproductive time for these staff. The clients possibly gain in service quality, however, because of short waiting times.

The patient numbers for service 'j' are perhaps insufficient to warrant a full-time service, but operation as a fixed, part-time service would reduce overall costs and increase the time available for consultation, thus improving cost-efficiency and the quality of the service. Similarly, mobile point 'a' may have sufficient patient numbers to justify its changing to a fixed, part-time clinic service that would improve the quality of the service through increased time per client, increased hours of operation (i.e. availability of the service) and a more pleasant environment for both public and staff.

Capital expenditure on clinic buildings and mobile vehicles has not been considered here, partly because of the complexities of analysis of the costs and benefits involved, particularly in relation to individual mobile points. The cost of building a clinic may be considered a negative factor, but a clinic building is generally an asset which increases in value, compared with the depreciating value and limited life of a mobile clinic, and has additional benefits for the community. If expenditure in running the service is reduced through improved cost-efficiency, this may soon compensate for the construction costs of a small clinic; if imaginatively designed, clinics can also be used for community purposes — meetings, adult evening education, social events, administration — and can generate rental income during evenings and weekends.

Within this local authority this analysis has suggested several ways in which the clinic service can be improved. Details such as minutes available for consultation and cost per minute consultation have better indicated the routes individual service points should follow in order to optimise the service, both in terms of costs and quality, than simply in respect of patient numbers, overall costs and cost per consultation. The latter may in fact be quite misleading, with services which appear cost-efficient in these terms (e.g. services 'i', 'k' and 'l') in fact being of poor quality, with only 2 - 3 minutes spent with each patient.

Fixed part-time clinics (e.g. mornings only or 3 days per week) appear to offer a combination of good value with improved quality in relation to mobile services in terms of hours of operation, consultation time and facilities, as attendance at a fixed clinic is far more acceptable to patients than waiting outside at a busy, infrequent mobile point. Such small clinics have the added advantages of creating local employment (including employment for their construction) and providing a valuable community facility with many other uses. It has been found in this analysis (Fig. 1) that the costs involved in maintaining the clinic building are offset by the savings in subsistence and transport. However, construction of a clinic for use by a mobile team is less cost-effective, with a greater proportion of expenditure going on costs which do not directly benefit the patients.

The building of clinics to serve only small communities is often rejected by planners, but more detailed examination may reveal that the provision of a small part-time clinic could bring about savings in running costs relative to an existing mobile service, in addition to the benefits mentioned above.

As the numbers of service points studied in this analysis are small and relate to only one health authority, the results cannot be generalised to other authorities' services, although some of the trends may be similar. This study may, however, serve as an illustration of how costs of different PHC services can be compared for management purposes. At this time of change in South Africa, where restructuring of health services is under way, it is suggested that the aspects discussed should be among those considered when services at local and district level are rationalised, in order to maximise the benefits to the public from available resources.

The assistance of the finance branch of the Development and Services Board with the provision of financial information, the nursing staff for the collection of statistics and Dr M. Richter, Department of Community Health, University of Natal, for reviewing the manuscript is gratefully acknowledged.

REFERENCES

1. Broomberg J, Rees H. Delivering at the right price — the costs of primary maternity care at the Diepkloof Community Health Centre, Soweto. *S Afr Med J* 1993; **83**: 272-275.
2. Valli A, Ferrinho P de LGM, Broomberg J, Wilson TD, Robb D. Costs of primary health care at the Alexandra Health Centre. *S Afr Med J* 1991; **80**: 396-399.
3. Kane-Berman JDL, Taylor SP. Containing costs in public-sector hospitals — a strategy for the future: lessons from a large teaching hospital. *S Afr Med J* 1990; **78**: 154-157.
4. Pillay S, Jinabhai CC. Cost effective primary health care services: Phoenix Community Health Centre. Paper presented at the 12th Epidemiological Conference, Durban, 18-20 August 1993.
5. Berman P, Brotowasisto M, Nadjib M, Sakai S, Gani A. The costs of public primary health care services in rural Indonesia. *Bull World Health Organ* 1989; **67**: 685-694.
6. Gray CS. State-sponsored primary health care in Africa: the recurrent cost of performing miracles. *Soc Sci Med* 1986; **22**: 361-368.
7. Ettl MB, Thimasam K, Shepard DS, Krachalkin S. Economic analysis of several types of malaria clinics in Thailand. *Bull World Health Organ* 1991; **69**: 467-476.
8. Chabot J, Waddington C. Primary health care is not cheap: a case study for Guinea Bissau. *Int J Health Serv* 1987; **17**: 387-409.
9. Broomberg J, Rees H. What does primary health care cost and can we afford to find out? *S Afr Med J* 1993; **83**: 275-282.
10. Over M. The effect of scale on cost projections for a primary health care program in a developing country. *Soc Sci Med* 1986; **22**: 351-360.

Accepted 17 Jun 1994.