

Haematology outreach clinics in the Free State and Northern Cape

Marius J Coetzee, Philip N Badenhorst, Engela P le Roux, Mathys J Doman

Objective. Evaluation of haematology outreach clinics in the Northern Cape and Free State.

Design. Retrospective analysis of records from March 1994 to February 1996.

Setting. Central South Africa is sparsely populated. Consultants from Bloemfontein held outpatient clinics in hospitals (with laboratories) in Bethlehem, Kimberley and Kroonstad.

Subjects. 117 patients with suspected haematological disease.

Main outcome measures. Input measures (population, number of clinics and costs), process measures (patient numbers, patients per clinic, new consultations per clinic, patients' domicile, how they were referred, types of diagnoses and number of patients with non-haematological disorders) and output measures (attrition, changes in attendance and savings).

Main results. The 84 clinics that were held, with 636 consultations, did not cost the State anything. Only 6% of the 117 patients had no haematological problem. Sixty-eight per cent had chronic haematological neoplasms. In Kimberley most of the patients came from Kimberley Hospital, while most of the patients at the other clinics were referred via Bloemfontein. There was only a 10% attrition rate and only one-third of patients were referred to Bloemfontein. We saved paying patients an estimated R21 260 in transport costs, while saving the State R172 992 by seeing patients at secondary, instead of tertiary, hospitals.

Conclusions. It is cheaper to send a doctor to an outreach clinic than to refer patients to a central facility, provided there is enough work for a doctor at the clinic. It costs the State much less for patients to be seen at a secondary than a tertiary hospital. Positive spin-offs include academic stimulation of doctors and laboratories in the periphery, with more appropriate referrals to teaching hospitals. Weaknesses include poor availability of expensive drugs at the clinics and lack of standardised

Departments of Haematology and Oncotherapy, University of the Orange Free State, Bloemfontein

Marius J Coetzee, MB ChB, MMed (Path), FCPATH (SA), DTM & H

Philip N Badenhorst, MB ChB, MMed (Anat Path), MD

Engela P le Roux, MB ChB, MMed (Haematol)

Mathys J Doman, BSc, PrSciNat

records. By commuting to outreach clinics, specialists can greatly reduce health expenditure and spread it from tertiary to lower levels. At the same time more patients have access to their services.

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Together the Free State and Northern Cape cover about 40% of the land area of South Africa but contain about 10% of its population (Fig. 1).¹ The only tertiary hospitals in the region are in Bloemfontein, where there were four haematologists during the study period. These hospitals treat patients from the Free State, but also from Lesotho, and parts of the Northern Cape, the Eastern Cape and North West. Patients with haematological conditions from this region are referred to the outpatient clinics in Bloemfontein. They repeatedly have to travel hundreds of kilometres, at considerable cost. Indigent patients travel by train or ambulance at the expense of the State. To limit travel, we often monitor patients between their clinic visits with the help of their general practitioners. However, this is not optimal for all conditions and we were looking for alternatives. At the same time health budgets were being rationed and there was a growing emphasis on health care for all.²



Fig. 1. Map of South Africa showing the provinces as well as those places mentioned in the text.

Early in 1994 our department established three outreach clinics that coincide with oncology clinics, which our sister Department of Oncotherapy runs. The clinics are held at Bethlehem Provincial Hospital (monthly), Voortrekker Hospital, Kroonstad (monthly) and Kimberley Hospital (fortnightly). Each of these hospitals is a regional State hospital and has a South African Institute for Medical Research (SAIMR) branch laboratory. Haematology

consultants commuted from Bloemfontein. The intention was to offer a more accessible and affordable service to more patients in the Free State and Northern Cape, in accordance with provincial policy.³ The Departments of Psychiatry^{4,5} and Oncotherapy at the University of the Orange Free State have been running similar clinics for a number of years. Australian haematologists (B Bain — personal communication) and oncologists,⁶ as well as Canadian oncologists,⁷ run outreach clinics.

The aims of this study were as follows: first, to evaluate the outreach service systematically; second, to compare our service with similar clinic services; and third, to identify aspects that need improvement.

Methods

We obtained approval from the Ethics Committee of the University of the Orange Free State. Then we retrospectively analysed the routine records of the clinics held between the beginning of March 1994 and the end of February 1996. We examined input (or structural) measures, process measures and output measures for each clinic.^{8,9}

Input measures included total population served, number of clinics and costs. We calculated the travel costs per clinic as follows. One particular consultant staffed each clinic. As the patients would otherwise probably have seen the consultant in Bloemfontein, we took the consultants' salary to be a constant. Their travel time fell within their routine overtime. The consultants travelled in provincial cars, with 1 300 cm³ engines. We calculated the travel expenses using the running cost of R0.85/km suggested by the Automobile Association of South Africa (AA) in 1995. The distances are those quoted by the AA at the beginning of 1996. In the Free State an outpatient visit costs the state R520 at a tertiary hospital and R248 at a secondary hospital (B Engelbrecht and T Germishuizen — personal communications). We assumed that the cost at Kimberley Hospital was the same. It was not necessary to consider other costs, as we used no extra facilities or staff. We used no extraordinary drugs or investigations.

As **process measures** we examined the following: the total number of patients seen; the number of patients seen per clinic; the number of new consultations per clinic; where the patients lived in relation to the clinic, from where they were referred; the total number of clinics held; the type of conditions seen and the number of patients seen with disorders that were primarily haematological.

We used the following **outcome measures**: attrition rates (for conditions that need follow-up), trends in clinic attendance (minimum, maximum and median) in the study period; and estimated savings for patients and State. We calculated potential savings for patients and the State by assuming that paying patients would have had to come to Bloemfontein in their 1 300 cm³ cars if there were no outreach clinics. Indigent patients would have used the minibus taxis contracted by the government.

Results

Input measures (Table 1)

The Free State covers an area of 129 437 km² (11% of the country) and has a population of 2 782 018 with a density of

21.5 people per km².^{1,10,11} The Northern Cape covers an area of 362 668 km² (30% of the country) with a population of 751 669 and a density of 2 people per km².^{1,10,11} Each of the clinics drained the area nearest to it. Many patients at the Kimberley clinic came from North West. However, the populations and their needs might change with growing urbanisation.¹

Table I. Input measures (potential transport costs only)

	Bethlehem	Kimberley	Kroonstad	Mean	Total
Distance from Bloemfontein (km)	245	175	210	210	-
No. of clinics	25	36	23	28	84
Total No. of consultations	98	341	197	212	636
Potential cost/clinic held (R)	417	298	357	357	-
Potential total cost (R)	10 413	10 710	8 211	9 778	29 334

Early in 1995 we increased the frequency of clinics at Kimberley to fortnightly because of the increased workload. The cost of transport to each clinic is a function of its distance from Bloemfontein. The clinics did not cost the government anything as we got lifts with the transport arranged for the oncology clinics. If we had used our own transport the cost would have been R29 334. The cost would have been higher if consultants had had to stay over.

Process measures (Tables II and III)

At least 94% of the patients at the clinics had a primarily haematological diagnosis. Sixty-eight per cent of the patients had chronic haematological neoplasms. This included the group of 28% of the patients who had myeloproliferative conditions (Table III).

Table II. Process measures

	Bethlehem	Kimberley	Kroonstad	Total
Population	86 817	181 828	116 864	385 509
Total patient visits	98	341	197	636
No. of patients on record	18	66	33	117
Max. No. of patients/clinic	6	18	13	-
Min. No. of patients/clinic	1	1	2	-
Median No. of patients/clinic	4	9	8	-
New patients/clinic	0.8	1.7	0.3	0.9
Haematological diagnosis (%)	100	94	94	96

At the Bethlehem clinic 94% of the patients came from the eastern Free State, and 71% were referred via Bloemfontein. At the Kimberley clinic 53% of the patients came from Kimberley and 58% were referred from Kimberley Hospital. The patients at the Kroonstad clinic all came from within a 100 km radius. Seventy-three per cent of them were referred via Bloemfontein. A few private physicians referred patients to the clinics.

Output measures (Tables IV and V)

Most of the patients seen at the Bethlehem and Kroonstad clinics were initially assessed in Bloemfontein and then referred to their nearest outreach clinic. In contrast most of

Table III. Types of haematological condition seen

	Bethlehem No. (%)	Kimberley No. (%)	Kroonstad No. (%)	Total No. (%)
Acute leukaemias	0 (0)	9 (14)	1 (3)	10 (9)
Myeloproliferative conditions	8 (44)	13 (20)	11 (33)	32 (27)
Myelodysplasia	1 (6)	1 (2)	1 (3)	3 (3)
Lymphoproliferative conditions	4 (22)	11 (17)	10 (30)	25 (21)
Myeloma	1 (6)	13 (20)	3 (9)	17 (15)
Congenital bleeding disorders	2 (11)	9 (14)	1 (3)	12 (10)
Idiopathic thrombocytopenic purpura	1 (6)	1 (2)	1 (3)	3 (3)
Thrombotic disorders	0 (0)	1 (2)	0 (0)	1 (1)
Deficiency anaemias	0 (0)	1 (2)	3 (9)	4 (3)
Haemolytic anaemias	0 (0)	1 (2)	0 (0)	1 (1)
Aplastic anaemias	1 (6)	3 (5)	0 (0)	4 (3)
Other blood diseases	0 (0)	3 (5)	2 (6)	5 (4)

the patients at the Kimberley clinic were referred from Kimberley Hospital (or the hospitals for which it is a referral centre). Most of the patients at each clinic lived locally. No more than one-third of the patients were referred to Bloemfontein at any stage. These referrals were mostly for admission to the haematology beds at Universitas Hospital. Approximately 10% of the patients had medical insurance. Altogether the clinics seem to have saved the paying patients an estimated R21 260 in transport costs. The fees for paying patients at secondary and tertiary hospitals are the same. Therefore these patients' outpatient accounts were not reduced. The Free State government provides contracted minibus transport to Bloemfontein for non-urgent cases; these run daily regardless of the patient numbers. They cost R440, R298 and R432 per day from Bethlehem, Kimberley and Kroonstad, respectively. The only saving for the State would therefore be if there were only haematology patients on the day of an outreach clinic, making the transport unnecessary (Table IV). For the purposes of the study we did not calculate the additional savings in patients' accommodation or in- and outpatient costs. In the Free State the cost to the State per day per bed is R1 560 and R270 for tertiary and secondary hospitals, respectively. Although we did not keep a record of admissions, we can assume that we saved a considerable amount of money by admitting patients to secondary instead of tertiary hospitals. The real savings were the reduction in the cost to the State because patients were seen at secondary hospitals instead of tertiary hospitals (Table IV).

Discussion

Limitations

As clinic records at the Bloemfontein clinics lacked adequate details, we cannot report from where and with what diagnoses patients were seen there in the preceding 2 years. We therefore lack an adequate 'control' population. We hope to be able to report such trends in the future. At each satellite clinic the records and statistics were not kept in the same manner. This made it difficult for us to collect comparable data. We aim to standardise these for all three clinics. We did not survey patient satisfaction. Such surveys are notoriously unreliable, however.^{12,13}

Table IV. Outcome measures

	Bethlehem	Kimberley	Kroonstad	Total
Patients to be followed up (%)	100 (18/18)	97 (64/66)	97 (32/33)	97 (109/117)
Patients lost to follow-up (%)	11 (2/18)	5 (3/66)	9 (3/33)	7 (8/117)
Referred to Universitas (%)	3/18 (17)	17/66 (26)	12/33 (36)	32/117 (27)
Transport costs saved (paying patients) (R)	4 082	10 145	7 033	21 260
No. of patient visits	98	341	197	636
Cost to the State of providing outpatient facilities (R248/visit)	24 304	84 568	48 856	157 728
Equivalent cost at a tertiary hospital (R520/visit)	50 960	177 320	102 440	330 720
Savings to the State (R)	26 656	92 752	53 584	172 992

Input measures

The central part of our country is sparsely populated; transport therefore constitutes a large share of the costs of referrals to tertiary hospitals. The cost of transporting patients by ambulance or minibus taxi includes that of the large vehicle and its staff. The contracts with minibus taxis are re-negotiated annually. If there are more outreach clinics the need for this service might decline. The cost of a doctor's commuting to a clinic is less, provided there is enough work at the clinic. This work includes not only quantifiable clinic and ward consultations, but also teaching and administration, which are more difficult to quantify in terms of costs. In their absence, the travelling consultants' urgent clinical work was shared by their colleagues. The Bethlehem clinic was potentially the most expensive because of the greater distance from Bloemfontein. The cost of treating patients with cancer, such as ours, has only been emphasised recently.¹⁴

Process measures

The Kimberley clinic saw the most patients. An advantage was that it is held during the daily oncology clinic at Kimberley Hospital that has a full-time radiation oncologist and specialised nursing staff. Patients with haematological malignancies were already being referred there, given that Kimberley Hospital is the regional hospital for the Northern Cape. The staff of the Department of Oncology, together with a medical officer from the Department of Internal Medicine, assisted patients between the clinics. We saw more patients with haemophilia in Kimberley. A number of the haemophiliacs attend the Elizabeth Conradie School there, which caters especially for students with physical disabilities. The provincial government of the Northern Cape now covers the consultants' transport costs.

The two Free State clinics outside Bloemfontein were smaller. Bethlehem Provincial and Voortrekker hospitals are regional hospitals, referring patients to the Bloemfontein tertiary hospitals. Problem cases have therefore usually been referred to Bloemfontein immediately. Many paying patients from the Bethlehem region are also referred to Gauteng. The local physicians already treat a number of haematological conditions in co-operation with our department, and therefore do not refer these patients to the clinics. Patients from the Free State goldfields around Welkom supported the

clinic at Voortrekker Hospital (Fig. 1). The local populations around these clinics are smaller than that of Kimberley.¹⁰ Therefore the total number of patient visits at each clinic may be related to the size of the local population.

Only 5 of 117 patients were referred to the clinics incorrectly. Chronic haematological neoplasms constituted over half of the cases, whole non-malignant conditions, especially anaemias, are perhaps underrepresented. Many doctors probably prefer to treat these themselves. In an attempt to promote optimal treatment and referral of patients, we developed a very basic *vade mecum* for the house staff of Kimberley Hospital.

Drugs and blood products for some haematological conditions are notoriously expensive and are used mainly in tertiary hospitals. Therefore secondary hospitals do not keep a large stock of some of these. Yet the local pharmacists did their utmost to assist us. If patients needed admission, e.g. for blood transfusions or operations such as splenectomy, we used the local hospital where possible.

Outcome measures

Where time permitted, we visited the SAIMR laboratory at the relevant hospital. These laboratories provide a reliable service with a short turn-around time. We could review blood and bone marrow specimens and hold impromptu tutorials for the staff. It appears that both we and the laboratory staff benefited from such cross-pollination.

We did not refer more than one-third of the patients back to Bloemfontein. These referrals were mainly for patients who needed an intensive diagnostic work-up, those with complicated haematological neoplasms or haemophiliacs who needed surgery. At the clinics, where there were staff trained to treat malignancies, fewer patients were referred to Bloemfontein. A low 10% of the patients were lost to follow-up. We tried to ensure continuity by assigning a particular consultant to each clinic. This consistency may have contributed to the good follow-up figure. All the clinics seem to have grown during the research period. The fact that patients had to travel less appears to be an important explanation for this growth.

General points

The Department of Haematology handled 636 consultations at the three clinics over the 2-year period. In comparison there were 3 891 consultations at the Bloemfontein clinics. Thus 14% (636/4 527) (95% CI 13.0 - 15.1%) of all consultations were at outreach clinics. This proportion may improve as the clinics become more established and known. The oncology staff handled 8 246 consultations at the three outreach clinics during the same period. This figure may reflect the greater prevalence of solid tumours relative to haematological neoplasms.¹⁵ It is difficult to compare our situation with that of other clinics. However, Dyer¹⁶ suggests that part-time clinics are cost-effective in a primary health care setting, a fact that is corroborated by our study.

The budgets of all hospitals, particularly tertiary hospitals, are currently under review. As a result of this our service is an attempt to provide appropriate care for more patients with haematological conditions at lower-level facilities. By seeing them at secondary hospitals we ensured that the cost of their management was reduced and did not have to be borne by tertiary hospitals. In these 2 years we saved the state R179 992 in outpatient costs. In addition the consultants never spent more than 10% of their time at the

clinics. It is to be hoped that referrals to our tertiary hospitals are more appropriate now. At two of the clinics we developed a system of writing our notes on a standard form and made two carbon copies, one for the patient's doctor and the other for the clinic's records. We aim to implement this duplicate report system at all three clinics, as such systems facilitate improvement in care.¹⁷

To conclude, the introduction of the decentralised outreach clinics forms part of the growing trend towards 'medical schools without walls'.¹⁸ Now that we have some basic information about the clinics we aim to institute ongoing medical audit. This may include audit of the management of certain conditions. The clinics seem to have fulfilled all initial expectations. The study demonstrates that specialists can greatly reduce health expenditure, both for patients and the State, and spread the costs more evenly by commuting to outreach clinics. At the same time such a strategy addresses the need for services at a level closest to the people. The non-quantifiable benefits, such as training of staff in the periphery, as well as patient satisfaction,¹⁹ are equally important.

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