Paediatricians in the RSA, 1981-2000

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Summary

A survey of all paediatricians registered with the South African Medical and Dental Council in July 1981 was conducted and the results were correlated with the child population as determined by the 1980 census. There were 201 active paediatricians, of whom 55% were employed in hospitals and 45% in private practice; 83% were resident in an area in which there were teaching hospitals, while only 23% of the total number of children resided in these areas. Sixty per cent of the children (95% of whom were Black) lived in predominantly rural areas where there were no paediatricians. The number of paediatricians in South Africa is expected to rise rapidly during the next 2 decades. We are therefore faced with the problem of having a paediatrician corps which although adequate in number is badly distributed, resulting in the rural population being grossly under-serviced. Possible solutions are presented.

Methods

Data were obtained on paediatricians, the child population and the training of paediatricians in the RSA.

Paediatricians

A questionnaire was sent to all paediatricians resident in the RSA and registered with the South African Medical and Dental Council (SAMDC). The area in which the paediatrician was working was assumed to be the same as the postal address listed in the SAMDC register. The questionnaire requested the following details: (i) age and sex; (ii) where did you receive your basic postgraduate training? (SA/UK/USA/other); (iii) privately or 'full-time hospital' employed?; (iv) if privately employed, how many 4-hour hospital sessions done?; (v) ratio of White to Black (African, Asian and Coloured) patients?; (vi) ratio of time spent on service, teaching, and research?; and (vii) in active practice or retired?

Child population

Data were obtained from the Department of Statistics, which provided a computer print-out of each race group's population figures in 5-year age groups for each of the 85 economic areas of the RSA. Population data for the independent areas of Transkei, Bophuthatswana and Venda were excluded, but those for Ciskei, Gazankulu, Kangwane, Kwantu, Kwazulu, Lebowa and Qwaqwa were included.

Training of paediatricians

Data on this were obtained from a questionnaire sent to the heads of all departments with accredited paediatric registrar training posts.

'Full-time service equivalent paediatricians'

In order to take into account the varying proportions of time spent by paediatricians on service, teaching and research, the concept of a 'full-time service equivalent' (FTSE) paediatrician was developed. The ratio of time spent on White and Black patients was also assessed here, so that for each geographical area the number of FTSEs available to each race group could be computed. Service availability to each race group was arrived at by multiplying the percentage of time spent on service by the percentage of time spent on each group. This is illustrated in Table I, which shows the data for hypothetical area 'X' serviced by 2 paediatricians, where there would be 0.84 FTSEs available to White patients and 0.56 FTSEs available to Black patients.

Results

Paediatricians

There were 266 paediatricians registered with the SAMDC in July 1981; 2 had since died, 41 were abroad and 22 had retired, leaving a total of 201 active paediatricians. Replies were received from 209 (93%) of the 225 paediatricians resident in the RSA. However, not all replies were complete.

Table II shows where these paediatricians were located; the high numbers in the Witwatersrand area and the Western Cape are noteworthy. Fig. 1 shows the age and sex distribution; the relatively large number of young specialists is striking and is a reflection of the increasing local capacity to train paediatricians.
### TABLE I. SERVICE AVAILABILITY OF PAEDIATRICIANS TO WHITE AND BLACK PATIENTS*

<table>
<thead>
<tr>
<th>Paediatrician</th>
<th>% Service</th>
<th>% White</th>
<th>% Black</th>
<th>White Availability</th>
<th>Black Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>80</td>
<td>90</td>
<td>10</td>
<td>0.72</td>
<td>0.08</td>
</tr>
<tr>
<td>B</td>
<td>60</td>
<td>20</td>
<td>80</td>
<td>0.12</td>
<td>0.48</td>
</tr>
</tbody>
</table>

* Computed as: (i) % service x % time for White or Black children per paediatrician; and (ii) sum of % service x % time for White or Black children for groups of paediatricians.

### TABLE II. PAEDIATRICIANS IN THE RSA WITH POPULATIONS OF WHITE AND BLACK CHILDREN AGED 0-14 YEARS AND SERVICE AVAILABILITY OF PAEDIATRICIANS TO THESE POPULATIONS

<table>
<thead>
<tr>
<th>Census area</th>
<th>No. of active paediatricians</th>
<th>Children aged 0-14 yrs</th>
<th>FTSEs/10000 children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Cape</td>
<td>51</td>
<td>112 680</td>
<td>331 600</td>
</tr>
<tr>
<td>George/Mossel Bay</td>
<td>1</td>
<td>9 900</td>
<td>79 240</td>
</tr>
<tr>
<td>Worcester/Ceres</td>
<td>1</td>
<td>11 400</td>
<td>65 900</td>
</tr>
<tr>
<td>Port Elizabeth/Uitenhage</td>
<td>10</td>
<td>50 750</td>
<td>180 750</td>
</tr>
<tr>
<td>Kimberley</td>
<td>2</td>
<td>9 980</td>
<td>44 620</td>
</tr>
<tr>
<td>East London</td>
<td>3</td>
<td>18 060</td>
<td>47 320</td>
</tr>
<tr>
<td>Durban</td>
<td>20</td>
<td>77 420</td>
<td>234 440</td>
</tr>
<tr>
<td>Pietermaritzburg</td>
<td>8</td>
<td>14 580</td>
<td>46 700</td>
</tr>
<tr>
<td>Empangeni</td>
<td>1</td>
<td>9 680</td>
<td>38 240</td>
</tr>
<tr>
<td>Pretoria</td>
<td>20</td>
<td>109 280</td>
<td>116 740</td>
</tr>
<tr>
<td>Witwatersrand</td>
<td>61</td>
<td>127 140</td>
<td>322 830</td>
</tr>
<tr>
<td>Vereeniging</td>
<td>4</td>
<td>115 560</td>
<td>186 820</td>
</tr>
<tr>
<td>Pietersburg</td>
<td>1</td>
<td>48 660</td>
<td>132 940</td>
</tr>
<tr>
<td>Nelspruit</td>
<td>1</td>
<td>63 200</td>
<td>78 360</td>
</tr>
<tr>
<td>Klerksdorp</td>
<td>3</td>
<td>43 440</td>
<td>130 540</td>
</tr>
<tr>
<td>Kroonstad</td>
<td>1</td>
<td>27 060</td>
<td>176 340</td>
</tr>
<tr>
<td>Welkom</td>
<td>1</td>
<td>15 800</td>
<td>139 760</td>
</tr>
<tr>
<td>Bloemfontein</td>
<td>8</td>
<td>19 720</td>
<td>35 040</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 880</td>
<td>181 800</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 120</td>
<td>39 700</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 240</td>
<td>53 480</td>
</tr>
</tbody>
</table>

**Age analysis male/female:**

- Private paediatricians overall
- Hospital employed paediatricians overall

![Fig. 1. Analysis of the age and sex of paediatricians in the RSA.](image)

![Fig. 2. Comparison of activities of paediatricians employed in hospitals and privately.](image)
during the last 10 - 15 years. The male to female ratio is 6:1. Fig. 2 shows the proportions of time spent on service, teaching and research by hospital-employed and privately employed paediatricians. There were 101 hospital-employed paediatricians and 87 in private practice.

The child population

There were 9,38 million children aged 0 - 14 years in the RSA in 1980, of whom 8,14 million were Black and 1,24 million White. Fig. 3 shows a circle representing this total and is divided into three segments according to the geographical location of paediatricians. Only 40% of the children live in areas where there are paediatricians, and 83% of the paediatricians are easily available to only 23% of the total number of children. Of the 5,68 million children who live in areas where there are no paediatricians, 95% are Black.

Training of paediatricians

In 1980 there were 134 accredited registrar training posts in seven centres in the RSA, an increase of 18 over 1975. In order to gain specialist registration with the SAMDC trainees must spend 4 years at a teaching hospital in a registrar post, complete a further year outside their specialty, and be in possession of an acceptable postgraduate degree.

Of 231 individuals accepted for paediatric training between 1975 and 1980 inclusive, 55 had resigned or changed to another discipline and 76 were still in training. Approximately 90 had completed their paediatric training and examinations successfully; of these 50 were employed in hospitals and 26 in private practice and 13 had emigrated. (It was impossible to account for 10 trainees and 1 qualified paediatrician because of incomplete data from the training centres.) During these 6 years 110 (20 in 1975) new paediatricians were registered with the SAMDC, an average of 18 per year. With the increasing capacity for training in the RSA one can reasonably expect an average of 20 registrations a year from 1980 to 1990 and 25 a year from 1990 to 2000. (This may well turn out to be an underestimate.)

Correlation of data on paediatricians with that on the child population

Table II sets out the geographical locations of the active paediatricians in the RSA, the numbers of White and Black children and the number of FTSEs per 10 000 White and Black children in each area. The average number of FTSEs per 10 000 children was 0,9 for Whites and 0,25 for Blacks, the overall average being 0,43. These figures apply only for those areas for which there were paediatricians; previous reference has been made to the fact that 60% of the children of the RSA live in areas where there are no paediatricians. If these are brought into the calculations the number of FTSEs per 10 000 children becomes 0,7 for Whites and 0,008 for Blacks. Comparative figures for the UK given for 1976 and 1980 were 0,3 and 0,5 respectively.

Reference to Table II therefore shows that White children are almost uniformly well catered for, that Black children in the areas in which there are teaching hospitals (Pretoria, Witwatersrand, Bloemfontein, Durban and the Western Cape) are reasonably well catered for but that Black children in the ‘non-academic’ areas are often very poorly served.

What about the future?

Population projections published by the Human Sciences Research Council show that the total child population of the RSA will increase from 9,38 million in 1980 to 13,29 million in 2000. However, the number of White children will decrease from 1,25 million (13,3%) to 1,03 million (7,7%).

On the basis of the number of training posts (134) existing in 1981, the expected increase over the next 18 years and the retirement age of 65 years, we have estimated that there will be 390 active paediatricians in 1990 and 640 in 2000. Fig. 4 shows the expected White and Black populations with the expected number of paediatricians for 1990 and 2000. Fig. 5 shows that providing the career expectations (top right on the figure) of the average paediatrician remain the same, the number of White children per FTSE paediatrician will fall from 15 100 at present to 3 900 in 2000. In the case of Black children the number will fall from 124 000 at present to 58 000 in 2000. However, the ratio of White to Black children per FTSE paediatrician was 8,2:1 in 1981, whereas in 2000 it will be 14,8:1 — in other words the maldistribution will become worse.

Fig. 4. Present and projected numbers of children and paediatricians in the RSA, 1980-2000.
Discussion

Gross maldistribution of paediatricians in relation to the child population of the RSA has been established beyond doubt by the above data. All over the world it seems that not only paediatricians but all doctors are attracted away from the rural areas to the large centres. The attractions are many and include financial opportunity, academic stimulation, leisure activities and schooling facilities for their children. South Africa is, however, different to other developing countries in several respects. Firstly, Black children are far more disadvantaged than White, mainly because large numbers live in rural areas away from sophisticated facilities. Secondly, in sharp contrast with the rest of sub-Saharan Africa, the RSA is fortunate to have as many as seven outstanding academic hospital centres, most of which are within 400 km of the heavily populated rural areas. Thirdly, these training centres are providing 20 new paediatricians every year, and this number will almost certainly increase. The opportunities for these graduates to emigrate are diminishing and the population of White children (which they mainly serve now) is decreasing. The last fact which is of importance is that as many as 20 million Black people are expected to move from the rural to the urban areas by the year 2000.6

Considering all the above factors, one is forced to make the inescapable conclusion that the best solution is that the academic hospitals expand their establishments in order to send both registrars and consultants out to adjacent rural areas for short periods on a rotational basis. The RSA has many rural hospitals which were previously run by missionaries but are now run by the State Health Department. In most cases they are grossly understaffed, depending on young doctors completing army service to meet their service commitments. There is therefore the beginning of a rural health infrastructure which requires only additional staff to allow it to function more effectively.

What would paediatricians do in the rural areas? One certainly does not envisage that they spend their time seeing endless numbers of children with gastro-enteritis, malnutrition and respiratory diseases! They would, however, be in a position to evaluate local paediatric needs, organize services, encourage, teach and support the local health personnel as well as consult on unusual problems.

It has been said that rural populations do not need the attention of specialists, but what they do need is more primary health care nurses. But that is a hard core of problems, such as low birth weight, malignant diseases and congenital heart disease to name but a few, which require the attention of specialists. As has been said before, paediatricians must act as managers of the paediatric health care delivery team. That this is a practical proposition is evidenced by the fact that paediatricians from the Red Cross War Memorial Children's Hospital in Cape Town already visit areas such as Ciskei on a regular basis.

This solution to our problem would meet the twin objectives of accommodating newly qualified paediatricians who would otherwise be superfluous in the urban areas, and providing a service to the presently grossly under-serviced rural areas. Because no one would have to move to the rural areas permanently, consultants would not be discouraged from remaining in the RSA. Exposure to the problems of the rural populations may well stimulate research into the solutions thereof which, in our view, would be more pertinent to the needs of our population as a whole than esoteric research in sheltered academic cloisters. Should the expected mass urbanization take place, the urban hospitals would have the staff to deal with the extra load and would simply send less people out to the rural areas.

Two alternative (but in our view inferior) solutions may be suggested. The first, put forward by Butler et al. in Australia, is that paediatric registrar posts should be only partly utilized for training paediatricians and that the majority of incumbents should be aspirant general practitioners holding the posts for 1 or 2 years. They would then go out to practice wherever economic forces took them, armed with a good grounding in paediatrics. The flaw in this solution for the RSA is that once having trained they would be very unlikely to settle in rural areas because of the strong counter-attractors of urban areas mentioned above. The other alternative is that there should be financial incentives, if only in the form of cheap housing and a territorial allowance, for young specialists to go out to rural hospitals for 1 or 2 years, subsequently to return to the urban areas. A few would no doubt be happy in the country and may stay on permanently. The flaw in this solution is that the problem of having too many doctors in the urban areas would be perpetuated.

Conclusion

We have shown that there should be adequate numbers of paediatricians in the RSA by the year 2000 but that their career expectations will have to change in order to meet the demands of a changing population.

We believe that the best solution for the problem of providing a service to the rural population (who cannot afford private attention) is for the academic hospitals to expand their establishments in order to send people out to the rural areas for short periods. We feel that this should be done on a properly planned basis so that the maximum number of children can benefit. Each Province should set up a planning committee in conjunction with the Department of Health and Welfare to achieve this objective, and paediatricians should be actively involved with these committees.

Because the need in rural areas is urgent and cannot be met by medical personnel in the near future, we believe that the training of paediatric primary health care nurses, preferably themselves coming from rural areas, should receive immediate attention.

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Review Article

An experimentally based safe method of administering intensive cancer chemotherapy

Prospects for increased survival in patients with 'solid' tumours during the next decade

L. A. PRICE, BRIDGET T. HILL

Summary

A clinically proven experimentally based method of administering intensive combination chemotherapy, which is much safer than methods used in the past, has been developed over the past 13 years. Clinical studies of several different tumour types over several thousand treatment cycles have confirmed the validity of this approach. The implications of this new method of administering chemotherapy to patients with advanced disease are discussed and its potential for improving the 'cure' rates for certain common 'solid' tumours such as breast, small-cell lung, bladder, prostate and ovarian carcinomas and squamous cell carcinomas of the head and neck is outlined.

In spite of advances in surgical and radiation therapy techniques cure rates for most common tumours have not improved significantly for several decades. One reason for this is the persistence of small numbers of tumour cells, the presence of which cannot be detected by currently available diagnostic techniques. Our inability to detect tumour cells until the neoplasm is relatively advanced biologically is illustrated in Fig. 1. Many tumours, such as those of the breast and lung, are therefore very often systemic at the time of presentation. Even in the case of tumours which traditionally spread to local draining lymph nodes and usually do not metastasize widely, such as squamous cell carcinomas of the head and neck, tumour cells often remain after skilled surgery or radiotherapy, and in patients with stage III and IV tumours in this group the failure rate at 5 years is approximately 80%. If all the tumour cells had been either removed or killed at the time of surgery or radiotherapy, the cure rates would obviously be much higher. It is therefore evident that to increase the cure rate in the treatment of many common tumours a systemic component will have to be added to the traditional initial therapy with surgery and radiation in an attempt to kill these undetected tumour cells. Over the past 20 years there has been considerable reluctance on the part of surgeons and radiotherapists to add chemotherapy as initial treatment because of the belief that intensive chemotherapy is invariably associated with unacceptable toxicity to normal tissues. The purpose of this article is to show that this widely held belief is not true and to point out ways in which intensive chemotherapy can be given safely, not only in cases of advanced disease but also as an 'adjuvant' in an attempt to increase the cure rates for certain common 'solid' tumours.

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