The 1983 distribution of hospitals and hospital beds in the RSA by area, race, ownership and type

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Summary
This study used published data to analyse the 1983 distribution of hospitals and hospital beds in South Africa by 'race', geographical area, type of hospital (academic, specialist, general or other) and the nature of ownership (e.g. state, for-profit). Hospitals and hospital beds were found to be inequitably distributed. Overall bed ratios were 150 whites per bed compared with 260 blacks/Asians/coloureds per bed. The distribution of beds by geographical area was 130 people per bed for urban whites, 260 for rural whites and 150, 460 and 300 for urban, rural non-'homeland', and 'homeland' blacks/Asians/coloureds respectively. These differentials are inefficient and unjust, and should be regularly documented to spur their decline. The continued collection of population group information from health service users is required to monitor ongoing inequity in distribution. The analysis of distribution by ownership and type suggested that only the public sector is able to provide a hospital service with the appropriate balance of all levels of care for the entire population; but within this sector the dominant position of tertiary care needs to be re-examined. The study highlighted the absence of adequate information on health care resource allocation and utilisation. Appropriate studies in these areas are required and consideration should be given to unifying the planning and management of all hospital resources.

Methods and data

Population denominators
The census, conducted by the Central Statistical Service (CSS), tabulates the population by 'race', age and sex, and region (province or non-independent homeland). The CSS figures exclude three of the four 'independent national states'. Data for these were obtained from the South African Institute for Race Relations.

Adjustments for population growth were made as follows: growth rates of 1,9% per year (urban) and 2,5% per year (rural and 'homeland') were applied to extrapolate the black population figures to 1983, as recommended by the CSS. The growth rate used for whites was 0,9%, for coloureds 1,86% and for Asians 1,8%. The 1983 population of South Africa was thus estimated to be 31 million, about 15% of whom were classified as white, 73% black, 9% coloured and 3% Asian.

The hospital-bed data do not generally give 'racial' allocation other than as white or BAC, and so the grouped population figures (i.e. BAC/white) were used in the analyses.

Categorising South Africa into areas
South Africa, as defined by the 1910 Union borders, was divided into four types of areas using an urban/rural hierarchy as modified by Botha et al. Three of the four types are in the present provincial area of South Africa — urban, small town and rural areas of the four provinces: Natal, Cape Province, Transvaal and the Orange Free State. Urban areas comprise magisterial districts containing settlements with more than 20 000 people, small towns are magisterial districts containing settlements with less than 20 000 people, and rural areas contain no population concentrations according to the 1980 census. The fourth area type is defined as all the areas of South Africa excised for black occupation under various laws since 1913, here called 'homelands'. The 10 'homelands' (3 of which were considered independent countries by the South African government in 1983) are here grouped into a single homogeneous area, with no internal division into urban and rural. The distribution of the BAC and white populations into the four geographical areas as defined in this study are shown in Fig. 1.

Source of hospital data
Data describing the number of hospitals, their level of sophistication, and the numbers of beds in each by 'race' were drawn from the 1984 edition of the Hospital and Nursing Yearbook, and describe the situation in late 1983. This book is a commercially published directory of potential buyers for companies marketing to the hospital and health care sector. It has been produced annually for over a decade and there is a check on each entry each year.

Classification of hospitals by type
Long-stay homes for mentally handicapped people were excluded. Each hospital (and its beds) was classified into one...
of four types, according to the facilities listed for each in the Hospital and Nursing Yearbook. In order of decreasing sophistication these categories are: (i) academic hospitals attached to university medical schools and with full specialist facilities; (ii) specialist hospitals, ranging from those with full specialist services to smaller hospitals with only one specialist; (iii) general hospitals, with at least inpatient medical, surgical and radiographic facilities; and (iv) 'other' hospitals — this category includes hospitals not able to deal with the basic work of the general hospital; they may lack one or more of medical, surgical or radiographic facilities, and include tuberculosis and infectious diseases hospitals, convalescent hospitals and private surgical clinics with only a recovery room and a few beds.

Classification of hospitals by ownership

Each hospital has also been classified by ‘ownership’ as at the date of study. There were 12 identifiable administrative groupings: (i) provincial hospitals operated by one of the four authorities in the province (non-‘homeland’) area of South Africa; (ii) ‘homeland’ hospitals controlled by 1 of 10 authorities, in the 4 ‘independent’ and 6 ‘self-governing homelands’; (iii) trust hospitals in areas of South Africa due for incorporation into any of the ‘homelands’; at the time of this study these were operated on an agency basis by the then South African Department of Health (now National Health and Population Development) and are similar to homeland hospitals; (iv) state hospitals operated by the central South African government Department of Health and providing mainly psychiatric and tuberculosis care — there is one academic hospital run by this authority and this is attached to the Medical University of Southern Africa; (v) industrial hospitals owned and run by large industrial, agricultural or mining corporations to provide care for resident workers; (vi) province-aided hospitals, mainly found in the Cape Province, i.e. private hospitals run for local communities, which receive a state subsidy in return for treating non-private patients; (vii) ‘fee-for-service’ hospitals privately or investor owned and operated for profit; (viii) other hospital owners include: (a) the South African National Tuberculosis Association (SANTA), a non-profit agency which provides tuberculosis care only; (b) contractors who are private for-profit corporations contracting to provide tuberculosis and psychiatric long-stay care to the state authorities; (c) the military authorities, which provide a full range of services to conscripts, professional soldiers and their dependants; (d) a small number of charitable agencies providing a miscellany of services; and (e) the municipal local authorities, which provide some infectious-disease beds.

Results

The following indicators of geographical and ‘racial’ hospital resource allocation were used: (i) the number of people per

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**Fig. 1. Population of South Africa, 1983.**
hospital bed, by 'race' and area category — to indicate overall resource distribution; and (ii) the number of people per hospital, by 'race' and area category — to indicate ease of access to hospital based facilities.

The results (Figs 2 and 3) show that a hospital bed reserved for people classified in the BAC group serves 73% more people than one reserved for whites, and the average catchment population of a BAC hospital is 4.25 times greater than for a white hospital. In general, the 'homelands' and rural areas have the lowest number of beds per capita.

Fig. 2. Hospital bed ratios, 1983 — people per bed (rounded to 10 people).

For the distribution of hospital resources by ownership and type the following indicators were used: (i) the number of hospitals and beds provided by the major owning authorities and sectors (Fig. 4); and (ii) the number of hospitals and beds, by level of sophistication of care provided ('type') (Fig. 5).

The public sector (province, 'homeland', trust, state and municipal authorities) provides half the hospitals and three-quarters of the beds. The fully private, fee-for-service hospital sector provides 6% of the beds, but 16% of the hospitals, explained by the small size of these hospitals. The industrial hospitals provide substantial contributions to the number of hospitals and beds in the country.

The contributions of other sectors become apparent when analysing the distribution of beds in the 'other' category in Table 1. The private contractors and SANTA offer long-stay care for mental illness and tuberculosis and the fee-for-service and the province-aided sectors contribute to the beds available for minor elective surgery and short stay medical care.7

Fig. 3. Hospital ratios, 1983 — 1 000 people per hospital (rounded to nearest 1 000).

Ownership and area category

The distribution of all beds by area categories is compared for two ownership groups, the public sector — defined here as 'homelands', provinces, and trust hospitals — and the fee-for-service sector. Fig. 6 shows that in contrast with the fairly even distribution of publicly owned hospitals, the fee-for-service hospitals are concentrated in urban areas.

Fig. 4. Hospitals and beds, 1983 — by ownership or administering authority.

Fig. 5. Hospitals and beds by type, 1983.

Fig. 6. People per bed by ownership and area, 1983.
Discussion and recommendations

Population data reliability

The population figures used are an underestimate of the true population, particularly of urban blacks. Although no estimate of undercounting was made for the 1980 census, after the 1985 census it was estimated that the true number of urban blacks could be 20% higher than the census figure. This means that our calculations of per capita resource allocations underestimate the 'racial' disparity, particularly in urban areas.

Area effects

The division of South Africa into four types of areas hides intra-area differences. Thus, some areas defined as urban and, according to the general conclusions of this work, as better served, will include peri-urban informal settlements, which are worse off than some rural areas.

Frequently, the proximity of the 'homeland' population to the urban hospital means that the urban hospital is in fact the closest and most appropriate source of care. In such cases it would have been more correct to count the 'homeland' population as part of the catchment population for the relevant hospitals. Finally, movement of patients across area category boundaries (not taken into account here) further increases the load on urban BAC health services.

Detailed regional studies of smaller functional geographical areas are therefore required to help the responsible authority determine its local health service needs and utilisation patterns.

Attention is drawn to the extent to which information in this article is out of date. While the distribution of hospital facilities changes slowly over time (although there have been significant increases in the fee-for-service sector), population distribution may alter rapidly. This has been the case in South Africa, particularly with the removal of the influx control laws in 1986. There has been a massive increase in urbanisation and a mushrooming of informal settlements in urban and peri-urban areas.

'Racial' disparity

Inequality by 'race' in the distribution of hospitals and beds is both unjust and inefficient. Non-racial access to hospital care would achieve more health benefit for the same expenditure.

While health services and budgets remain segregated, there remains a need for all health services to record patient and service data by 'population group' classification. This information could be used to monitor changes in the 'racial' patterns of resource distribution.

Geographical disparity

First-contact care and general hospital care should be equitably distributed at district level so that there is little urban/rural disparity. This is desirable from the point of view of providing adequate access to primary and emergency care, as well as for reasons of efficiency in the referral system so as not to overburden specialist hospitals.

However, it is more efficient in terms of both average distance travelled per patient and economies of scale to have large, highly specialised facilities sited in population centres, with patients from rural and 'homeland' areas given transport assistance to improve their access. Our results confirm the above pattern of urban/rural disparity for non-'homeland' areas. The population per bed is higher in rural than urban areas but the population per hospital is lower. This indicates widespread distribution of small hospitals in the rural areas and relatively fewer, large hospitals in urban areas. However, in the 'homelands', there are both too few hospitals and too few beds.

Clearly, these indicators (per capita distribution of beds and hospitals) are insufficient on their own and need to be supplemented in future research by evaluations of the referral systems, in particular the availability, affordability and timeousness of transport facilities. In addition, the quality of care, especially in the peripheral hospitals, needs to be assessed, since this also is an aspect of equity.

Prominence of the academic hospital sector

The prominence of the specialist and academic hospitals, which comprise one-tenth of the hospitals and one-third of the beds, is clear from this study. The benefits (including research and training) to the population of providing specialised and expensive care or palliation of complex disease should be weighed against the lost opportunity of spending those sums for the prevention, care or cure of less complex but, in terms of overall population impact, more common and serious diseases.
Sectoral capabilities

The study also illustrates the large number of agencies responsible for administering hospitals. This leads to duplication of effort and fragmentation of information and responsibility and complicates the planning process.\(^\text{10}\)

The public sector dominates the provision of hospital services. It is characterised by a relatively equitable geographical distribution of the different types of beds, a well-developed infrastructure, and extensive experience. We suggest that the public sector is therefore optimally suited to meet the national hospital service priorities.

In contrast, the fee-for-service hospitals are overwhelmingly concentrated in the urban areas. This reflects the market demand for private fee-for-service care and draws attention to the inability of this sector to provide for the needs of the majority of the population.

Health information systems and future research

Community-based health status and health care utilisation surveys are the foundation of health care planning in most industrialised and many less developed countries.\(^\text{12}\) This study was carried out because of the absence of directly collected data on hospital resource utilisation: the need for such data remains.

Conclusion

South Africa's hospitals are an expensive and complex resource. If the health care system is to meet the demands of the future then the equitable distribution, effectiveness and efficiency of this resource must be attended to. Restrictions on access to health care by 'race' should be removed and the planning, management and evaluation process should be unified.

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