

Validity of the register of medical practitioners for manpower planning

Results and recommendations from a postal sample survey

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Summary

A postal survey was conducted to assess the validity of the register of medical practitioners held by the South African Medical and Dental Council. This register has been used by researchers as a data source for assessing the distribution of medical practitioners. The register is not adequate for this function unless adjusted by sample survey results. Crucially, it overestimates rural and homeland doctor resources. The survey also revealed under-representation of women as doctors (17% of all doctors are women) and as specialists (6% of all specialists are women) and unavailability due to retirement of registered doctors as service providers (6% of all registered doctors are retired), particularly in community health (24%). Collection of this information at annual registration is recommended, along with the establishment of an 'overseas' section of the South African register. Failure to implement these recommendations will seriously impede health services research.

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The *Register of Medical Practitioners, Interns and Dentists*¹ is the official list of all doctors qualified to practise in South Africa, as compiled by the South African Medical and Dental Council (SAMDC). Registration is compulsory. The register is updated monthly by addition of newly qualified or newly arrived doctors and removal of doctors who fail to pay their subscription, commit serious disciplinary transgressions, are notified as having emigrated or died, or ask to be removed from the register. Every year this is collated and printed.

The register has been used as a source of information for medical manpower planning. Beaton and Bourne² quantified the emigration of doctors. Botha *et al.*³ used the register as the basis for a projection of the adequacy of the doctor supply to 1990.

Both the above articles address crucial issues in health planning but suffer from deficiencies of the register. Firstly, registered addresses are assumed to be those at which practitioners provide their service. Secondly, all registered practitioners are assumed to be in full-time clinical practice. Thirdly, the register does not provide demographic data (gender or age).

A postal survey on a sample of registered practitioners was carried out in order to ascertain: (i) the accuracy of the name and address, as recorded on the register; (ii) the accuracy of the registered address as a surrogate for work address, and the

direction of systematic errors, if any; and (iii) the gender, age, work availability and activity of doctors.

Methods

Sample

The 1983 register was obtained on computer tape from the SAMDC.¹ All interns and practitioners with registered addresses outside South Africa and South West Africa/Namibia (1910 borders) were excluded. Stratified random samples of 1 020 specialists (from 4 332 in total) and 1 017 non-specialists (from 13 061 in total) were drawn. The sample was surveyed by means of a questionnaire sent to the registered address in mid-1985.

Stratification

Non-specialists were allocated into one of 24 strata, one for each of the possible combinations of region, 'province' and 'university' of primary medical qualification. There were two regional categories (urban or rural, defined according to the hierarchy of Davies and Cook,⁴ recently updated by Botha *et al.*³), three 'provinces' (referring to SWA/Namibia, the ten 'national states' and the remainder of the RSA), and four qualifying 'universities' (English, if the first medical qualification was from the predominantly white, English-language medical schools; Afrikaans, if from the white Afrikaans-language medical schools; African, if from the University of Natal or the Medical University of Southern Africa, the two medical schools then 'entitled' to train black Africans; or Overseas if the individual had gained his or her qualification outside South Africa).

The specialists were stratified only according to their speciality. Related specialties were grouped (appendix 1) and 17 strata were formed.

Sixty randomly selected subjects were surveyed from each stratum or the entire stratum was surveyed if it contained fewer than 60 individuals.

Questionnaire

A questionnaire in English and Afrikaans with a covering letter was posted to the registered address of each of the 2 037 subjects. The questionnaire showed the full name, address, qualification and speciality (if any) of the doctor as obtained from the register, as well as gender (inferred from the subject's first name). The respondent was asked to make any correction needed and to give his or her year of birth, work activity status (working full-time or part-time, or not working due to retirement, child rearing, temporary unemployment, or non-medical employment) and work address, if different from registered address. These responses were coded and entered onto a computer.

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Non-responders

If no reply was received within 6 weeks, a second, identical questionnaire was sent. Six months later non-responders listed in any telephone directory were telephoned. The remaining non-responders were then sought on the 1986 register and on the list of doctors removed from registration during the period 1983-1986. This list includes the reason for deregistration, and was used to identify probable reasons for non-response.

Results

Results are reported with the approximate 95% confidence interval (CI) in brackets (i.e. not adjusted for stratification).

Accuracy of registered name and address

None of the specialist responders and 1,99% (CI 1,00-2,98%) of the non-specialist responders had errors or changes to their names; in all cases these were trivial.

Of the responding non-specialists 9,04% (CI 9,02 - 9,06%) had substantial address inaccuracies, and, in our judgement, could only have received their questionnaire because it had been forwarded from their registered address to their current address. Only 3,95% (CI 3,94 - 3,96%) of specialists' addresses had changed or were sufficiently incorrect to have required forwarding.

Registered v. work address

Of the responding non-specialists 69,02% (CI 65,71 - 72,33%) were registered at their work address. However, 13,96% (CI 11,48 - 16,44%) were working in an area which was significantly different in location or urban/rural character from their registered address and the remainder (17%) did not answer the question or failed to supply enough information to analyse such changes.

Of responding specialists, 83,01% (CI 80,46 - 85,56%) were registered at their work address, 2,99% (CI 1,84 - 4,14%) were working in a significantly different area, and 14% did not supply sufficient information.

The use of the registered address as a surrogate for the work address underestimated the number of urban non-specialists by 12,07% (CI 8,52 - 15,62%) and overestimated the number of non-specialists working in rural areas by 9,07% (CI 6,36 - 11,78%). Similarly, the register underestimated the number of non-specialists working in the RSA (excluding the homelands) by 10,33% (CI 7,04 - 13,62%) and overestimated those working in SWA/Namibia and the national states by 6,92% (CI 2,56 - 11,28%) and 8,50% (CI 5,31 - 11,69%) respectively.

Smaller absolute numbers of specialists were misclassified, but the small numbers working in rural areas and national states makes for large proportionate misclassifications with very wide confidence intervals. The register overestimated the number of specialists working in urban areas by 0,89% (CI 0,23 - 1,55%), but underestimated those in rural areas by 15,55% (CI 4,96 - 26,51%). It overestimated the number of specialists working in the RSA excluding the national states by 0,49% (CI 0,01 - 9,7%), but underestimated the number working in the national states and SWA/Namibia by 21,43% (CI -0 - 42,92%) and 25% (CI -0 - 67,43%) respectively.

Demographic information not on the register

Gender

Women comprised 17,21% (CI 14,55 - 19,87%) of all non-

specialists. There were variations between strata, ranging from 8,62% (CI 4,45 - 12,79%) in the rural areas of the provinces to 18,06% (CI 12,0 - 24,12%) in the urban areas. Women comprised 15% (CI 9,09 - 20,91%) of non-specialists in the national states and 11,67% (CI 7,61 - 15,73%) in SWA/Namibia.

Overall, women comprised 6,25% (CI 4,59 - 7,91%) of specialists. The specialties with the highest proportion of women were community/preventive medicine (18,87%; CI 8,34 - 29,4%), dermatology (12,77%; CI 3,23 - 22,31%), radiology (other) (10,42%; CI 1,78 - 19,06%), pathology (other) and anaesthetics (8,7%; CI 0,56 - 16,84%) and paediatrics (7,69%; CI 0,45 - 14,93%). The specialties with the lowest proportion of women were otolaryngology, orthopaedic surgery, medicine-related, surgery and surgery-related.

Age

Non-specialists were, as expected, younger (mean ages: women 41 years, men 40 years) than specialists (women 48 years, men 50 years).

Year of first registration is an adequate surrogate measure of age, the average age at basic medical graduation being 25 years.

Activity

A substantial proportion of registered medical practitioners on the 1983 register were not active in a medical field at survey: 6,21% (CI 4,43 - 7,99%) of non-specialists and 6,13% (CI 4,48 - 7,78%) of specialists. There was marked variation over strata, but no pattern was discernible for non-specialists. Particularly high proportions of three specialties were not medically employed: community and preventive medicine (24,52%; CI 12,94 - 36,1%), radiology (other) (16,67%; CI 6,13 - 27,21%), and pathology (15,69%; CI 5,71 - 25,67%).

Of male non-specialists 6,03% (CI 5,73 - 6,33%) were not medically employed, compared with 11,11% (CI 4,62 - 17,6%) of female non-specialists. The reasons for non-specialists not being medically employed were as follows: 4,26% of men were retired, 1,42% were permanently employed in a non-medical field, and 0,36% were temporarily unemployed for other reasons; 5,56% of women were retired, 4,44% were temporarily unemployed due to child rearing, and 1,1% were temporarily unemployed for other reasons.

Of male specialists, 6,65% (CI 6,36 - 6,94%) were not medically employed, similar to the 6,0% (CI 0 - 12,58%) for female specialists. The reasons given by specialists for not being medically active were as follows: 5,52% of men were retired, 0,71% were permanently employed in a non-medical area, and 0,42% were temporarily unemployed for other reasons; 4% of women were retired, while 2% were temporarily unemployed for other reasons.

Clearly the largest proportions of doctors who are not working are retired, and the other categories, even child rearing in women, have very small frequencies.

Of those doctors who were medically employed, 7,77% (CI 5,49 - 10,05%) of male non-specialists, 20,25% (CI 11,39 - 29,11%) of female non-specialists, 12,1% (CI 9,61 - 14,59%) of male specialists and 21,28% (CI 9,58 - 32,98%) of female specialists were in part-time employment. No pattern was evident over strata for either non-specialists or specialists.

Of the registered non-specialists, 6,93% (CI 6,72 - 9,03%) of men and 11,11% (CI 4,66 - 17,56%) of women were older than 65 years of age. Of these, 48,71% (CI 33,02 - 64,4%) of men and 50% (CI 19,01 - 81,99%) of women were working. Of male specialists 11,88% (CI 9,49 - 14,27%) and of female specialists 10% (CI 1,68-18,32%) were older than 65; 69,05% of these men (CI 59,16 - 78,94%) and 40% of these women (CI 0 - 82,94%)

were working. In the group of doctors older than 65 years who continued to work, 40% (CI 18,53 - 61,47%) of male non-specialists, 46,55% (CI 33,71 - 59,39%) of male specialists and all female specialists and non-specialists worked part time.

Non-responders (Tables I and II)

In 81% of cases in which a questionnaire was sent to a non-specialist it was returned or the doctor could be traced by telephone (this includes questionnaires returned marked 'address unknown', as this conveys the information that the address as registered is wrong). For specialists this figure was 88%.

TABLE I. RESPONSE TO SURVEY BY WAVE OF RESPONSE

Wave	Respondents (%)	
	Non-specialists (822)	Specialists (894)
Replied, first mailing	61,4	70,9
Replied, second mailing	24,0	20,4
Traced by telephone	14,5	8,6
Total	99,9	99,9

TABLE II. RESPONSE TO SURVEY BY CATEGORY OF RESPONSE

Response	Non-specialists		Specialists	
	No.	%	No.	%
Emigrated	10	1,0	12	1,2
Died	11	1,0	16	1,6
Replied	752	73,9	836	82,0
No information	49	4,8	30	2,9
Total	822	80,8	894	87,7
No response	195	19,2	126	12,3
Total	1017	100	1020	100

Using information in the register, there were no significant differences in gender, year of qualification, language/race of university, or urban/rural residence between responders and non-responders in either the specialist or the non-specialist group. Non-specialists resident in the RSA are found more often than expected among the non-responders, while doctors resident in the national states are disproportionately represented among the group who were successfully contacted by telephone. These differences did not apply to the specialist group.

All specialties except microbiology and physical medicine (both extremely small, less than 5 of each in the register) had response rates greater than or equal to 80%.

Where are the non-responders?

We compared our non-responders with the list of doctors removed from the register between 1983 and 1986. Of the non-specialists, 6 had died, 17 had been removed due to failure to pay their fees (usually a sign of emigration), and 2 had asked to be removed from the register (a sign of emigration or of retirement), leaving 170 on the register who are 'genuine' non-responders. Of the specialists 6 had failed to pay their fees and 2 had died, leaving 118 'genuine' non-responders.

We then checked whether the remaining non-responders were on the current 1986 register, and found that all but 1 non-specialist and all specialists were still registered. Of these, 2 non-specialists and 5 specialists gave foreign addresses, confirmation of emigration. We were able to obtain, in total, information on 848 (83,4%) of the non-specialists and 902 (88,4%) of the specialists in our sample.

Not available for service

Of non-specialists for whom we have survey information, 1% had emigrated and a similar percentage had died. For specialists the proportions were slightly higher, i.e. 1,2% had emigrated and 1,6% had died. If we add the group who failed to pay, died, had foreign addresses in 1986 or asked to be removed during the period 1983- 1986, it can be concluded that 48 (4,7%) non-specialists and 41 (4%) specialists who were listed on the South African register as having South African addresses were not available to practise in the country 3 years later. Among the 'true' non-responders and among those who were on the register in a given year but with foreign addresses there were of course many more who are similarly not available. This is additional to the group described above who were not medically active, mainly owing to retirement.

Discussion and recommendations

The information obtained in this survey indicates that the medical register is inadequate in content and validity as a data source for basic health services research requirements. This in no way implies that it is inadequate to meet its statutory purpose, namely to serve as a list of professionals entitled to practise in the country. In fact we can confirm that it is extremely accurate for the identification of doctors' names and qualifications. However, these are not themselves useful for health services research. For all other uses the information obtained from the register itself should be modified by data obtained from a survey. The survey reported here is adequate for some information, for a time, but periodic surveys will have to be conducted in the years to come to cope with changing trends.

The registered address is not adequate as a location point for the address at which services are supplied. There are two reasons for this. Firstly, the registered address may have changed. Substantial numbers of address changes (more for non-specialists) occur rapidly after registration, and these are not random — for non-specialists they reinforce the pattern of urban/rural maldistribution, which is thus underestimated by the use of the register. Secondly, the registered address may remain accurate but does not represent the address at which services are supplied. For a small number of specialists this results in underestimation of the services in rural and homeland areas.

The registered address is invalid as the location of service provision for 3% of specialists and 14% of non-specialists. This invalidity is important because it involves errors in relation to major boundaries and substantially different recipients of medical practitioner services. Future work based on the register must take this into account.

It proved impossible to establish the number of doctors who are not available to provide services, although registered with local addresses. The real scope of the problem will only become clear when we include as 'not in South Africa' those who have had their names removed from the register because of emigration, those on the register who give non-South African addresses and are not working in South Africa, and those who have left the country but retain South African

addresses. The emigrants described in this paper fall into the last group. The other doctors 'not in South Africa' were not detected by this survey.

There is no information about gender or age on the register and these omissions need to be addressed. Our information indicates that women are under-represented in the medical profession, with no improvement among more recent graduates. This implies a constantly low admission of women as medical students until 1977. There may be improvements underway in more recent groups.

The register contains no information on work activity; our survey indicates that a substantial proportion of registered doctors are not providing medical services at all. This affects a higher proportion of registered non-specialists than of specialists, and is mainly due to retirement, surprising given their younger average age. There is no clear pattern to the strata of non-specialists affected. For specialties, there are three strata which are particularly badly affected. In order of severity the affected specialties are community medicine, radiology (other) and pathology. Compounding this high proportion of inactive doctors, these three specialties also have the smallest number of practitioners. The implications of the shortages, particularly in community health, for South African health priorities is an important matter for discussion.

Our information indicates that more specialists than non-specialists work part-time, and this is more marked for women. This suggests that the response of women doctors to child care and other social pressures is to work part-time rather than to stop working. Any perceived loss of 'investment' in training women doctors should take this into account.

There are no systematic differences, as far as we could tell, between the responders and the non-responders. This suggests that the results of this survey can safely be generalised to the entire doctor population from which we sampled.

It should also be noted that adequate response rates were obtained in this postal survey of specialists and non-specialists. This was because it was a sample survey, so that the numbers of non-responders were not too large to merit second mailing as well as subsequent telephonic follow-up. Sample surveys are to be recommended for this reason.

However, there would be no need for a survey at all if the information discussed in this paper was routinely collected at the annual compulsory re-registration. We suggest four questions that should be added to the registration form and, without making it too long, would yield valuable information for manpower planning. These recommendations are in close agreement with those of the Brown Commission⁵ and the responding White Paper.⁶

1. Gender (only required at first registration).
2. Race of practitioner (only required at first registration).
3. (i) Are you working medically?
(ii) Are you working medically full time?

4. (i) Name of major time employer and work address.
(ii) Name of next most common employer and work address.

Encoded on computer, this would provide extremely valuable information with which to monitor the distribution of our valuable resource of medically trained personnel. As a pilot scheme, the first year, this could be sent to a sample of the registered doctors, including interns and those registered at foreign addresses.

We further propose that the SAMDC register be adapted to include an overseas list, on which would be recorded doctors with the right to practise in South Africa, but not actually doing so at present owing to having a foreign residential address and work address. This would help us clear our 'active' register of non-practising doctors, preventing inaccurate judgements of our situation and improving our ability to assess future training and health service needs.

We would like to thank the South African Medical and Dental Council for access to the computer tape of the Register.

Appendix

The specialist strata were as follows: medicine, surgery, dermatology, anaesthetics, obstetrics and gynaecology ophthalmology, orthopaedics, otorhinolaryngology, pathology paediatrics, psychiatry, radiology (diagnostic).

The remaining specialties were grouped as follows: neurosurgery, plastic surgery, plastic and maxillofacial surgery, plastic and reconstructive surgery, thoracic surgery and urology as surgery-related; physical medicine, cardiology, nuclear medicine and neurology as medicine-related; pathology (anatomical), pathology (chemical), pathology (medical), pathology (forensic), pathology (haematology), pathology (clinical) and pathology (microbiology) as pathology (other); radiology, radiology and electrotherapeutics and therapeutic radiology as radiology (other); and preventive medicine and community health as community/preventive medicine.

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