International Journal of Epidemiology

Vol. 7 No. 1
Printed in Great Britain

Tonsillectomy and Circumcision: Comparisons of Two Cohorts

M CALNAN[1] J W B DOUGLAS[2] and H GOLDSTEIN[3]

Calnan M (Health Services Research Unit, Cornwallis Building, University of Kent at Canterbury, England), Douglas J W B and Goldstein H. Tonsillectomy and Circumcision: Comparisons of Two Cohorts. *International Journal of Epidemiology* 1978, 7: 79–85

Changes in the prevalence of tonsillectomy and circumcision in eleven year olds are described in two birth cohorts spaced 12 years apart. Both types of operation were less prevalent in the later (1958) cohort; tonsillectomy fell by a fifth and circumcision by more than half. These falls were confined to tonsillectomy before the age of six and circumcision under one year.

Social class differences in tonsillectomy were found in both cohort studies but the strong social class gradient in circumcision reported in the 1946 cohort had vanished in the 1958.

Regional and birth rank differences are found for both types of operation; these show substantial changes over time. These results are discussed in the context of changing professional opinions about the worth of these operations.

INTRODUCTION

This paper uses information gathered in two cohort studies – started in 1946 and in 1958 – to compare the prevalence of tonsillectomy and circumcision among children of 11 years. The 1946 study started at a time when informed criticisms of both these operations were beginning to appear. The 1958 study started after a period of twelve years of intense and continuing professional criticism. Our aim is to show the changes in the proportions of children who were circumcised or had their tonsils removed in Great Britain, in different regions of the country, in different occupational groups and in different types of family.

Both tonsillectomy and circumcision were common before the war. Glover (1) reported that in the period 1919–1937 the number of children at public elementary schools in England who had their tonsils removed rose from 42,000 to 84,000. Comparable figures for circumcision are not available, though Doll and Hadley (2) found that among males aged 15–65 circumcision was more frequent among the younger than among the older.

The evaluative studies so far published on tonsillectomy suggest that for children at ages between 5 and 7 there are some short-term benefits. For example in the 1946 cohort, removal of tonsils between the ages of 6 and 7 was accompanied by a substantial reduction in symptoms of upper respiratory infection and nasal obstruction. (3) There was, however, little evidence of long-term benefit in for example fewer absences from school.

The lack of even one well-planned clinical trial of tonsillectomy according to Venters and Bloor (4) justifies the lack of consensus that exists on the value of the operation, and this probably accounts for the widespread variations in the assessment of children as needing tonsillectomy. (5, 6) However, as Bloor (7) points out, even ear, nose and throat specialists who have a "common subscription to a corpus of scientific knowledge of ENT practice, phrased in general terms" show consistent variations in their routine assessments.

Circumcision is generally performed during the first few weeks of life when there is rarely any medical indication for the operation (8). In this country the value of circumcision was questioned by Gairdner (9) in 1949 and since then the medical profession has discouraged circumcision so that it is now an uncommon operation performed mainly for religious reasons or for specific medical indications. No substantial change in this attitude of disapproval has occurred in recent years (10), though Bolande (11) suggests that "little serious objection can actually be raised against (ritualistic) neonatal circumcision since its adverse effects seem miniscule". Richards, Bernal and Brackbill (12),

[1] National Child Development Study – 1958 cohort. Address. Health Services Research Unit, Cornwallis Building, University of Kent at Canterbury, England.

[2] National Survey of Health and Development – 1946 cohort. Address. MRC Unit on Environmental Factors in Mental and Physical Illness, London School of Economics, 20, Hanway Place, London W1, England.

[3] National Child Development Study – 1958 cohort. Address. Institute of Education, 20 Bedford Way, London WC1, England.

however, suggest that circumcision may be associated with early behavioural changes in the child which could effect early parent–child interaction and have far reaching consequences for later development. We will return to this suggestion briefly at the end of this paper.

In the past both tonsillectomy and circumcision were more common among the 'well-to-do' (1, 9) and marked regional variations were also reported (1) for tonsillectomy. No satisfactory explanation has been given for these differences which may reflect variations in standards of medical assessment or in the value placed on the operation by different social groups and in different parts of the country.

METHOD

The two longitudinal studies that provide the data for this paper are the National Survey of Health and Development (1946 cohort) and the National Child Development Study (1958 cohort). The former grew out of a national study of the maternity services which covered 13,687 births in Great Britain during the first week of March 1946. A sub-group of 5,362 children from this cohort has been followed up at not less than 2 year intervals to the age of 27. Included in the sample are all children whose fathers were non-manual or agricultural workers and one quarter of the rest; all multiple or illegitimate births were excluded. The resulting excess of middle class and agricultural workers families makes a small difference in overall prevalence and in regional and birth rank differences for both circumcision and tonsillectomy. The original population can however be regained by multiplying by the reciprocal of the sampling fraction.

The 1958 cohort is a continuation of the perinatal survey which covered all children born in Great Britain in the first week of March of that year. These children have been followed up at 7, 11 and 16 years and the study which was originally launched by the National Birthday Trust Fund and the Royal College of Obstetricians (13). In order to make the two cohorts populations as similar as possible, multiple and illegitimate births and births in families that entered Britain after 1958 have been excluded from the 1958 cohort.

In the 1946 cohort 1,145 children had lost their tonsils by their eleventh birthday. All but 13 of these had stayed in hospital for at least 24 hours and the records for 90% have been checked with the institutions concerned. The remaining 13 were reported to have had their tonsils removed at home or without spending a night in hospital. They have been omitted from this analysis and the proportion who lost their tonsils by eleven is 27% (26% after adjustment for sampling). Additional information from parents and school doctors is used below to check the reliability of the information that parents give. The information on circumcision comes from questions asked of the mothers at 4 years and from the school doctors' 11 year medical examination. The proportion circumcised by eleven is therefore precisely known but the age at circumcision may have been influenced by faulty recall.

In the 1958 cohort information on both the removal of tonsils and circumcision came from the parents answers to questions at the 11 year follow-up.

It seems from the 1946 cohort data that the reports of parents on whether their children have had their tonsils removed is reliable. For example at 7 years the reports of both mothers and doctors were available for 4,134 children, 860 of whom had already lost their tonsils. There were only six reporting errors, all by doctors. It is by no means certain however, that the correct age of operation is obtained from the same source. Unfortunately, we have no means of testing this and we have to bear in mind in the subsequent discussion that the ages of tonsillectomy for the 1946 study are exact as they were obtained from hospital records, whereas in the 1958 cohort we relied on the mothers for the age of tonsillectomy and their answers will have been subject to errors of recall and possibly biased by current views on the operation (14). In both cohorts the age at circumcision involved some element of recall.

The 1946 and 1958 cohorts use a different method of occupational classification which mainly affects the non-manual working class group which has therefore not been sub-divided in the following analysis. The manual workers in both cohorts were classified according to skill, though the classification used in the 1946 cohort was based on the 1951 census and that in the 1958 cohort on the Registrar General's occupational classification published in 1966. It is, however, unlikely that the alterations in the definition of skill levels during this period were sufficient to distort the subsequent comparisons. A final problem of occupational classification was that the self-employed workers were coded as a separate group in the 1946 cohort but in the 1958 were assigned to occupational groups according to the nature of their work.

TABLE 1

Prevalence of Tonsillectomy· Birth to 11 years 1946 and 1958 Cohorts

	Age	<4 yrs	4<6 yrs	'6<8 yrs	8<11 yrs	0<11
% Tonsils Removed at specified age	1946 cohort	2.5* (103)	9.8* (433)	8.8* (397)	4.5* (199)	25.7* (4186, 9916*)
	1958 cohort	1.7 (364)	6.3 (849)	7.1 (957)	5 0 (674)	20.1 (13,479)
	Father's Occupation					
		non-manual	*skilled manual*	*semi-skilled manual*	*unskilled manual*	*self employed retired etc.*
% Tonsils removed	1946 cohort	30 7 (1528)	27.2 (1169)	22.9 (626)	24.1 (198)	24.6 (602)†
	1958 cohort	20.9 (4235)	19.7 (5476)	17 9 (2224)	15.0 (765)	–
	Region					
		North	*Midlands*	*South*	*Wales*	*Scotland*
% Tonsils removed	1946 cohort	22.7* (1038)	26.2* (1011)	28.1* (1406)	15.9* (234)	29.8* (497)
	1958 cohort	19.2 (3548)	16.9 (3263)	21.4 (3890)	16.5 (690)	26.8 (1328)
	Birth Rank					
		First	*Second*	*Third*	*Fourth*	*Fifth or higher*
% Tonsils removed	1946 cohort	28.9* (1724)	27.4* (1347)	21.3* (626)	18.2* (245)	17.2* (244)
	1958 cohort	22.5 (5294)	18.9 (4437)	16.6 (1827)	13.2 (718)	10.7 (383)

N.B. Figures in brackets are actual numbers i.e. *NOT* adjusted for sampling in the 1946 cohort.
Percentages or numbers starred (*) = Population estimates
† Excluded from analysis of variance

TABLE 2

Prevalence of Circumcision Birth to 11 years 1946 and 1958 Cohorts

	Age	<1 yr	1<4 yr	4<11 yr	0<11	
% circumcised at specified age	1946 cohort	17 5*	2 5*	2.7*	22 7* (2072, 4895*)	
	1958 cohort	4.6	2 8	2.5	10.9 (6746)	
	Father's Occupation					
		non-manual	*skilled manual*	*semi-skilled manual*	*unskilled manual*	*self-employed retired etc*
% circumcised	1946 cohort	29.8 (755)	20.7 (565)	18 9 (301)	21.5 (135)	25.6 (316) †
	1958 cohort	11.4 (2160)	10.7 (2802)	9.7 (1115)	8.7 (404)	–
	Region					
		North	*Midlands*	*South*	*Wales*	*Scotland*
% circumcised	1946 cohort	23.0* (545)	24.3* (485)	24.9* (664)	28.5* (117)	10.7* (261)
	1958 cohort	9.1 (1781)	10.8 (1665)	14.1 (1946)	8.2 (353)	5.7 (638)
	Birth Rank	*First*	*Second*	*Third*	*Fourth*	*Fifth or higher*
% circumcised	1946 cohort	28.2* (858)	22.2* (656)	16.9* (315)	13.9* (133)	15.2* (110)
	1958 cohort	11 4 (2660)	11 3 (2288)	8.7 (904)	7.6 (343)	6.5 (201)

NB Figures in brackets are actual numbers, i.e *not* adjusted for sampling in the 1946 cohort
Percentages or numbers starred (*) = Population estimates
† Excluded from analysis of variance

METHOD OF ANALYSIS

The data from the two studies are first shown separately and then combined and analysed jointly in a series of analyses of variance‡ using the proportions who had lost their tonsils by 11 years and the proportions who had been circumcised by that age as the dependent variables in a log-linear model (see for example Bishop et al (15) for an account of this model). The independent variables consist of (a) "cohort effect", namely whether the individual belonged to the 1946 or the 1958 cohort (b) social group, (c) region, (d) birth rank. A further analysis tested the difference in age distribution between the studies after allowing for social class.

As already mentioned the 1946 cohort sample is stratified by social class and population estimates may be obtained by appropriate weighting. This has been done for many of the comparisons and the resulting figures have been starred (*). In the analysis of variance, social class is always one of the independent variables.

‡ Details of these are available from the authors.

RESULTS

For the study on tonsillectomy the number of children in the 1946 cohort was 4,186 (population estimate 9,916*), and in the 1958 cohort 13,479. For the study of circumcision there were 2,072 (4,895*) boys in the 1946 cohort and 6,746 in the 1958.

TONSILLECTOMY

By 11 years 25.7% (27.4% in the unadjusted sample) of boys and girls born in 1946 had lost their tonsils compared with 20.1% of those in 1958. This modest fall was confined to operations on children aged 6 years or less, 12.3% of whom had their tonsils removed in the earlier cohort and 8.0% in the later. As Table 1 shows, above the age of 6 years there was little change in tonsillectomy between the

cohorts.

Both studies show the highest prevalence of tonsillectomy in the non-manual workers' children and the lowest in the semi-skilled and unskilled workers' children and both studies also show a declining prevalence in passing from the first born to the fifth and later born children.

There have been only small changes in the prevalence of tonsillectomy in Scotland, Wales and the North, whereas in the Midlands, and to a lesser extent in the South, there has been a substantial fall. The regional changes moreover are not related to the original prevalence of tonsillectomy. Thus Scotland with high rates in 1946 shows only slightly reduced rates in 1958 and Wales with low rates in 1946 shows a slight increase.

These comments refer to the prevalence of tonsillectomy in the two studies when each background variable is taken in turn. They make no allowance for interaction between the variables.

The analysis of variance used "Tonsillectomy by eleven" as the dependent variable and 'cohort effect', father's occupation (manual/non-manual) and *anyone* of sex, region or birth order as the independent variables. Thus three separate analyses were done, all of which showed a highly significant fall in tonsillectomy between 1946 and 1958. There were, however, no significant interactions.

A further analysis of variance to test differences in the age distribution of tonsillectomy in the two cohorts after allowing for father's occupation shows significant interactions between cohort and age. This analysis also shows that whilst there are social class differences in the age distribution of tonsillectomy within studies, these social class differences are the same for both studies. Thus the shift away from early tonsillectomy is not accounted for by postponement of the operation among middle class children in the 1958 cohort.

CIRCUMCISION

By 11 years 22.7% of the boys born in 1946 and 10.9% of those born in 1958 had been circumcised. Table 2 shows that this considerable reduction has been achieved by a fall in circumcision during the first 4 years of life. At later ages there has been no change – 5.2%* were circumcised after 4 years in the earlier study and 5.3% in the later.

The decline in circumcision is proportionally greatest for children of non-manual workers though at all occupational levels, and notably among the children of unskilled manual workers, the decline has been substantial.

In 1946 the major regional peculiarity was a low level of circumcision in Scotland and a high level in Wales – a reverse of the figures for tonsillectomy. By 1958 circumcision in Wales was much reduced and from having the highest rate it had moved to the second lowest. Only Scotland had a lower rate.

In both cohorts the chances of being circumcised were high for the first born and decreased as birth rank increased and in each birth rank the rates recorded in 1958 were substantially lower than those recorded in 1946.

The analysis of variance confirms both the movement away from early circumcision and the significance of the overall decline in circumcision. It also reveals statistically significant interactions between 'father's occupation and birth order' and between 'father's occupation and cohort'. Table 3 gives an indication of the nature of these interactions.

Table 3A shows that the non-manual/manual working class differences in circumcision which

TABLE 3

Prevalence of circumcision: birth to 11 years by (a) father's occupation and region and (b) father's occupation and birth rank (1946 and 1958 cohorts)

		A. *Region – per cent circumcised by 11*				
		North	Midlands	South	Wales	Scotland
1946	non-manual	27.1	29.7	35.4	28.4	16.0
cohort	manual	17.6	19.6	24.0	18.6	9.9
1958	non-manual	9.9	11.1	14.0	10.5	5.3
cohort	manual	9.4	10.5	13.3	10.0	5.1

		B. *Birth rank – per cent circumcised by 11*				
		First	Second	Third	Fourth	Fifth or higher
1946	non-manual	30.0	30.0	30.1	20.6	34.4
cohort	manual	24.7	22.3	16.4	19.5	9.6
1958	non-manual	11.6	11.6	11.6	7.3	13.8
cohort	manual	11.8	10.5	7.5	9.6	4.2

were evident in the 1946 cohort have been largely eliminated by 1958. Although the incidence of circumcision dropped considerably in all occupational groups, the largest reduction occurred in the non-manual sector. This change occurred uniformly for each of the regions. Table 3B shows that in both studies, birth rank makes no difference to the risk of circumcision among middle class children. But among the manual working class children, the risk falls off steeply with increasing birth rank in both the 1946 and 1958 cohorts.

DISCUSSION

The prevalence of tonsillectomy fell from 26%* in the 1946 cohort to 20% in 1958 and the prevalence of circumcision from 23%* to 11%. In both operations the main fall appears to have been in early life, the first 6 years with tonsillectomy and the first year with circumcision. However, the ages given for tonsillectomy in the 1958 cohort were those recalled by the mothers and the ages of circumcision depended on recall in both cohorts. Remembered events tend to be advanced in time and this could explain part of the age differences described. On the other hand we have found that hospital admissions very early in a child's life are remembered with great accuracy by mothers, and it is only after children have reached the age of two that serious errors of recall occur. Early circumcisions are unlikely to be placed wrongly and the removal of tonsils in the pre-school years would be expected to be differentiated by mothers from their removal after 6 years. We therefore feel these age changes are not artefacts.

There was perhaps less agreement in the medical profession about the undesirability of tonsillectomy than about the undesirability of circumcision. In many respects however, the latter has less to be said against it as an operation and more to recommend it. It makes negligible calls on surgical resources and hospital beds and complications are rare. It is now evident that the majority of tight foreskins retract in later life, but when there are clinical reasons for the removal of the foreskin a successful cure is the outcome. Circumcised men rarely get cancer of the penis, are less vulnerable to venereal infection, and their wives may have a reduced risk of cervical cancer.

Circumcision is usually performed at an age when there seems little need to bother about the pain inflicted. In rats, however, early painful stimuli may have long lasting effects and it has been suggested that human infants also may be similarly affected. Richards *et al* (12) suggest that circumcision at birth may result in disturbances of behaviour that alter mother/child relations and could have long term implications for development. However, in the 1946 study no difference between uncircumcised and circumcised was found for a number of developmental and behavioural indices once birth rank, country of origin, occupational group and religion were allowed for. There is thus no reason to believe that the early pain of circumcision has any long term developmental effect even if there is evidence which suggests that circumcision may be related to early disturbance of the relationship between mother and child.

That circumcision has been so markedly reduced during these 10 years and more recently is explained by the very early age at which this operation is usually carried out so that refusal to circumcise a child immediately after birth is likely to lead to permanent retention of the foreskin unless there are later medical indications. It is clear from Table 2 that the decline in the operation has been solely owing to the reduction of early circumcisions, i.e. within the first 12 months and probably earlier than this since 71% of the circumcisions during the first year of life in the 1946 study were done in the early weeks after birth. The dramatic fall in the first year of life may therefore be attributed largely to paediatric opinion exerting itself through the hospitals.

The fall in the prevalence of tonsillectomy during this period was only half that recorded for circumcision and was mainly concentrated in the first six years of life. There have been no social class changes in the distribution of tonsillectomy in the two studies and this suggests that the fall has been independent of any generally disseminated views on the undesirability of tonsillectomy since these would have been expected to be best received by middle class families. The fall in the pre-school years and the failure to find a fall in the primary school years suggests another explanation, namely the different sources of medical advice available to parents and their children in these two stages of life. In the pre-school years it was the family doctor who recommended or refused to recommend tonsillectomy, but in the school years the school medical officers also played a part. Thus, at the 6 year school medical examination of the 1946 cohort children school doctors recommended that 7% should have their tonsils removed and during the subsequent year this is the proportion who lost them. In suggesting that the school medical officers were more resistant than family doctors to changing views on the value of tonsillectomy we should bear

in mind that in the 1930's and 1940's this operation was considered valuable by school medical officers who were constantly seeing undernourished children with discharging ears, running noses and greatly enlarged tonsils who had not been under medical care in their pre-school years. Indeed, so common was the recommendation for tonsillectomy in those days that the school medical service in some areas was known as "the tonsillectomy service". (Personal comment by retired S.M.O.)

The virtual elimination of occupational group differences between 1946 and 1958 in circumcision and their retention in tonsillectomy is unexpected. A more marked reduction of these differences in tonsillectomy would have been anticipated for the following reasons. Firstly, the advent of the National Health Service made surgery increasingly available to the poorer families although the availability of private practice may have benefited the affluent in attempts to avoid the delays caused by waiting lists. Secondly, the main reduction in tonsillectomy has been in the first six years i.e. at the age when social class differences in the 1946 cohort were most marked. Thirdly, middle class parents would have been expected to be more aware of changes in medical views than working class parents. This third explanation is based on the assumptions of a theory of cultural lag (4). Future comparisons with the 1970 cohort (16) may help to explain this anomaly.

Why is the prevalence of tonsillectomy in Scotland so high? It is evident that the poor housing conditions in Scotland compared with other regions (17) would put the population at a greater risk of infectious diseases such as respiratory complaints and so increase the likelihood of tonsillectomy. Alternatively, perhaps the explanation lies with availability of surgical resources and differences in surgical procedures. Firstly, Scotland has a larger proportion of ENT surgeons than other regions. Secondly, it could be argued that Scottish ENT practice is somewhat different and separate from English practice, i.e. they have a separate ENT Association. If so, these differences may have led to a heavier reliance in Scotland, than south of the border on examination evidence and a belief that a relatively wide spectrum of clinical signs indicate surgery. However, a difference in structure does not explain the large variation between Wales and the rest of the country.

Pre-school children in large families encounter infection brought back from school by their older siblings and so it would be expected that a high proportion would have infected tonsils and have them removed. Yet in both studies it is the older rather than the younger who lose their tonsils. If it is the school medical services which recommend children for tonsillectomy the low rates of tonsillectomy in later born children might be expected since on reaching school these children are more resistant to colds and sore throats owing to their pre-school infection.

Future comparisons with a later cohort (1970) may well show a more dramatic fall in tonsillectomy and a change in the social pattern. So far only figures for 993 children are available (18). They show 0.1% without tonsils at 4 (the figure in 1958 was 1.7%). A less dramatic change may be found in circumcision since 5.1% of 508 boys in the 1970 cohort had been circumcised by the age of 4 years (7.4% in 1958).

In this study we have presented statistical evidence of an association between a reduction in the prevalence of two surgical procedures and increasing professional criticism about their therapeutic or prophylactic efficacy. However the relationship between scientific medical knowledge, medical opinion and treatment policy needs closer scrutiny for as Richards (19) has shown there are problems "involved in the acceptance and rejection of new ideas and the assessment of the value of research from judgements based on narrow scientific terms".

ACKNOWLEDGEMENTS

The 1946 cohort study is now sponsored by the Medical Research Council and the 1958 cohort study by the National Childrens Bureau. We wish to thank Mrs B Alderman and Dr M Bloor for their help and advice and our colleagues from both birth cohorts for their many helpful comments and criticisms.

REFERENCES

(1) Glover J A, The incidence of tonsillectomy in school children. *Proceedings of the Royal Society of Medicine* 31: 1219, 1938.

(2) Doll R and Hadley A L, Correspondence. *British Medical Journal* i: 181, 1950.

(3) Douglas J W B, Prospective study of effectiveness of tonsillectomy in children. *In* Davies A M (ed). Uses of Epidemiology in Planning Health Services. Proceedings of the Sixth International Scientific Meeting, Primosten, Yugoslavia. International Epidemiological Association, Savremera Administracija, Belgrade. 1973.

(4) Venters G and Bloor M, A review of investigations into adenitonsillectomy. *British Journal of Preventive and Social Medicine* 28: 1, 1974.

(5) Bakwin H, The tonsil-adenoidectomy enigma. *Journal of Pediatrics* 52: 339, 1958.

(6) Wood B, Wong Y K and Theodonidis C G, Paediatricians look at children awaiting adenotonsillectomy. *Lancet* ii: 645, 1972.
(7) Bloor M, Bishop Berkeley and the adenotonsillectomy enigma; an exploration of variation in the social construction of medical disposals. *Sociology* 10: 43, 1976.
(8) MacCarthy M D, Douglas J W B and Mogford C, Circumcision in a national sample of 4-year old children. *British Medical Journal* ii: 755, 1952.
(9) Gairdner D, The Fate of the Foreskin. *British Medical Journal* ii: 1433, 1949.
(10) Wright J E, Non-therapeutic circumcision. *Medical Journal of Australia* i: 1083, 1967.
(11) Bolande R P, Ritualistic surgery – circumcision and tonsillectomy. *New England Journal of Medicine* 280: 591, 1969.
(12) Richards M P M, Bernal J F and Brackbill Y, Early behavioural differences; gender or circumcision? *Developmental Psychobiology* 9: 89, 1976.
(13) Fogelman K, (ed.) Britain's sixteen-year-olds. National Children's Bureau, London, 1976.
(14) Yarrow M R, Campbell J D and Burton R V, Recollections of Childhood: a study of the retrospective method. Monograph of the Society for Research in Child Development, 138, 35, 5, 1970.
(15) Bishop Y M M, Frienberg S E and Holland W P, Discrete multivariate analysis. MIT Press, Cambridge Mass. 1975.
(16) Chamberlain R, Chamberlain G, Howlett B and Claireaux A, British Births 1970 Heinemann Medical Books, London. 1975.
(17) Essen J and Parrinder D, Housing for Children – further findings from the National Child Development Study. *Housing Review* 24: 112, 1975.
(18) Osborn A, Personal communication. 1976
(19) Richards M P M, Innovations in medical practice: obstetricians and the induction of labour in Britain. *Social Science and Medicine* 9: 595, 1975.

(*Revised version received 25 August 1977*)

SPECIAL PROGRAMME FOR RESEARCH AND TRAINING IN TROPICAL DISEASES

World Health Organisation 1977

The Search for Scientists to Search for the Tools to control the Tropical Diseases

The search for new tools to control disease in the tropical countries requires scientists of many disciplines. Molecular and cell biologists, biochemists, immunologists, parasitologists and entomologists are among those whose contributions are needed.

The research areas covered by the Special Programme for Research and Training in Tropical Diseases are:

- malaria, schistosomiasis, filariasis, trypanosomiasis, leishmaniasis and leprosy;
- epidemiology, biomedical sciences, biological control of vectors, and socio-economic research.

Specific fields within these research areas are developed by the Programme's Scientific Working Groups. Scientists from any country are welcome to submit proposals for research grants within the specific fields. All enquiries should be addressed to:

The Special Programme for Research and Training in Tropical Diseases
World Health Organization
1211 Geneva 27, Switzerland

For those persons seeking contact with Special Programme participants in the United Kingdom, a Special Programme Committee has been set up by a group of interested scientists there to provide such information. The Committee also has research proposal forms available. Correspondence should be addressed to:

UK National Committee of the TDR
c/o Mrs J Beard
Medical Research Council
20 Park Crescent, London W1N 4AL, UK
Specific enquiries may be addressed to the attention of the Chairman, Professor David Bradley.

Should scientists in other countries wish to organize such liaison Committees, we should be pleased to collaborate with them and to publicize their activities. Any suggestions in this regard should be addressed to the Director of the Special Programme.