PREVALENCE OF PERNICIOUS ANAEMIA IN GREAT BRITAIN

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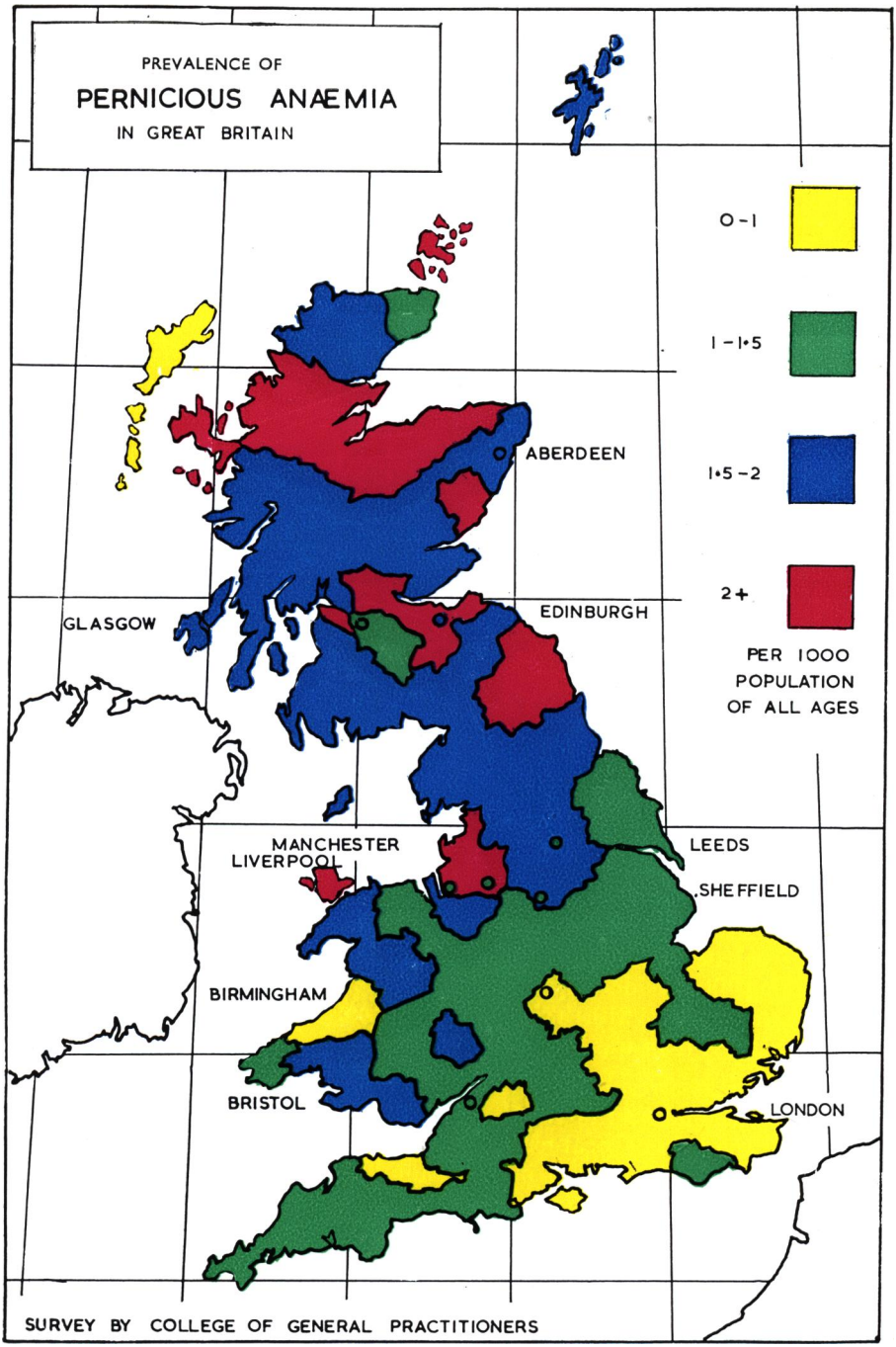
Nothing is accurately known about regional variations in the prevalence of pernicious anaemia in Great Britain, or indeed in any other country. For this reason, and because family doctors are so well placed to supply the necessary information, the College of General Practitioners has attempted a pilot survey covering the British Isles. The results relating to Great Britain are presented here in the form of a map.

The survey was an extension of a study begun with the help of colleagues in neighbouring practices around Ashford in Kent. This information was presented first to the research committee of the South-east England Faculty of the College, and later to the research committee of Council. With their help it was extended to cover all parts of the country.

Method

Collecting Information. The earliest stages of the survey were largely employed in exploring ways and means of circularising general practitioners. In spite of help from faculties, and through the research notification system of the Epidemic Observation Unit, it was soon realized that sufficient information could not be collected from College members alone, even if all took part. In summer 1957 a letter was published by all the principal medical journals inviting family doctors throughout the United Kingdom and Eire to supply me with the necessary information. Even this approach yielded less than was required.

Finally as a result of a visit to the Ministry of Health and with the advice and help of Dr G. E. Godber, a scheme was devised to utilize the help of local medical committees and executive councils throughout the country, in distributing copies of the *pro forma.* This was completely successful. Only one report was collected from each practice. The information was supplied on a simple *pro forma* asking for the numerical total of the practice and the number of patients with pernicious anaemia. Cases should have been diagnosed at least by blood count and have developed in the area of the practice


PREVALENCE OF
PERNICIOUS ANAEMIA
IN GREAT BRITAIN
0-1
1-1·5
1·5-2
2+
PER 1000
POPULATION
OF ALL AGES
ABERDEEN
EDINBURGH
GLASGOW
MANCHESTER
LIVERPOOL
LEEDS
SHEFFIELD
BIRMINGHAM
BRISTOL
LONDON
SURVEY BY COLLEGE OF GENERAL PRACTITIONERS

concerned. Subacute combined degeneration of the spinal cord was to be included, but not the pernicious anaemia of pregnancy or after gastrectomy or sprue. Doctors were asked for clinical comments and these were recorded on the back of their index cards for future reference.

Constructing the map. The map shows the distribution of different prevalence rates of locally diagnosed pernicious anaemia, calculated for each vice county, the colour indicating the rate for the area. It is necessary to explain how the incidence rate for each vice county was computed. Take South Devon as an example. A *pro forma* taken at random gives the practice population as 2,050, including three patients with pernicious anaemia diagnosed locally. 89 such reports were received from doctors in South Devon as a whole, and the sum total of population in these practices was 285,740, with 316 cases of the disease. The prevalence of locally diagnosed pernicious anaemia was approximately 1.1 per thousand population and therefore the colour of this vice county is green. Each vice county or other area has been treated as a separate unit and the same applies to large conurbations denoted individually; but the demarcation lines are only shown where the colour changes.

Results

Reports have been received from doctors in 4,700 practices in Great Britain, covering a population of just over 16 million. The prevalence rates varied from over 2 per thousand to under 1 per thousand, the highest rate being 2.46 per thousand in Banff and Elgin and the lowest 0.60 per thousand in Hertfordshire. In most areas, the rates fell between 1 and 2 per thousand. Rates were also calculated for the different countries: that for England was 1.19 per thousand, for Wales 1.53, and for Scotland 1.80. For Great Britain as a whole the rate was 1.27 per thousand.

Four groups were chosen for demonstration on the map, namely; those areas with rates under 1 per thousand (coloured yellow on the map), those over 1 and less than 1.5 per thousand (green), over 1.5 and less than 2 per thousand (blue) and those with rates over 2 per thousand (red).

The map shows that the rates are similar to each other over wide areas of the country but that, in general, there is a decreasing prevalence from north west to south east of Great Britain. Rates for large cities are similar to, if not the same as, those of neighbouring counties. Rates for thinly populated areas such as the Islands, north-west Scotland and some parts of Wales, are not thought to be as reliable as those for the remainder of the country, being calculated on total populations of less than 50,000. Over this size of population, further reports from other doctors did not tend to

alter the rate materially, even when the practice figures were quite large.

The difference in rate from one county to another is gradual, even where the colour on the map changes. For example, the rates in Berkshire, Oxfordshire and Gloucestershire (shown green) are only just over 1 per thousand; whereas those of Staffordshire and Derbyshire (also green) are only just under 1.5 per thousand.

Discussion

The regularity of the gradient in prevalence of pernicious anaemia from one part of the country to another was unexpected. The problem now is to try and determine its causes. Pernicious anaemia appears to be more common in people with blood group A than in those of other groups. Maps now being made by Dr Mourant of the Nuffield Blood Group Centre to show the distribution of the A B and O blood groups in the United Kingdom, however, indicate that group A is least common in the north and west where pernicious anaemia is most common and *vice versa*. Inequalities in the distribution of blood group A, therefore, cannot be the cause of the variations in prevalence of pernicious anaemia revealed by our survey.

Professor L. J. Witts has suggested that the variations in prevalence of pernicious anaemia now may match variations in the rate of unemployment in the 1930's. This hypothesis is being tested more closely.

Another possible correlation is with the geological structure of each area. It is to be noted that in general the rates are low where sedimentary rocks are to be found and highest where the rocks are predominantly volcanic.

Clearly a great deal more work must be done before any useful answer can be given. Meanwhile those who have contributed to the survey can justifiably feel that their efforts have served to break new ground.

The survey has also shown that ways can be found to collect from general practitioners valuable information about diseases or other conditions, which are well-defined. Experience in this enquiry suggests that, in any future survey, time should be taken to choose the method of collecting information best suited to the purpose. It will probably be wise for one person to analyze all the material, even though several subsidiary collecting points are set up. For example, several faculties of the College made particular efforts to secure a good response from their members; in other counties the best results came with the help of executive councils. All the reports, however, were analyzed centrally by the same person.

Summary

Information was collected from doctors in 4,700 practices in Great Britain, with a total population of over 16 million, about the prevalence of pernicious anaemia diagnosed locally by blood examination.

Prevalence rates varied from under 1 per thousand to over 2 per thousand. The rate for Great Britain as a whole was 1.27 per thousand.

The rates varied gradually from one county to another, the highest being in the north and west, the lowest in the south and east. The rate for Scotland was 1.80 per thousand, for Wales 1.53 and for England 1.19.

Acknowledgements

It is scarcely feasible adequately to acknowledge the help and co-operation of so many who have contributed to the completion of the survey: Professor L. J. Witts for the stimulus of his advice and interest; Drs R. J. F. H. Pinsent and G. I. Watson of the Research Committee of Council; others such as Drs I. M. Scott, J. M. N. Parry, J. McA. Williams, P. G. S. Kennedy, F. H. Staines and E. J. R. Primrose who have organized collections within their faculties; and many others who have contacted their friends and colleagues.

The College is also greatly indebted to Dr G. E. Godber and Dr R. E. Ford of the Ministry of Health and the Divisional Medical Officers; Drs C. M. Fleming and R. D. Martin of the Department of Health for Scotland; to clerks of executive councils and local medical committees; to Messrs. C. L. Bencards, Ltd for prompt and generous help in printing copies of *pro formas*, etc., usually at short notice; and especially to F. Maxwell Eve, Esq. for the artistic reproduction of my original map.

Finally, to all those general practitioners who have completed and returned the *pro forma* often accompanied by valuable clinical notes (no easy task where a large partnership is concerned) I would like to express my sincere thanks.

APPENDIX

Definition of demarcated areas or vice counties

These areas are selected on a county basis. In the case of large counties, however, division has been effected into E. & W. or N. & S. as convenient.

Divisions are briefly indicated as follows:

Cornwall is vertically bisected through Truro into E. & W.
Devon into N. & S. by a line from Tavistock—Tiverton.
Somerset into N. & S. by a line from Bridgwater—Ilchester.
Wilts. is horizontally bisected into N. & S. through Devizes.
Hants. horizontally into N. & S. through Winchester.
Sussex vertically into E. & W. from Brighton—Crawley.
Kent into E. & W. by the river Medway and to Hawkhurst.
Essex into N. & S. horizontally through Chelmsford.
Suffolk and *Norfolk* into N. & S. by the vertical 1 degree E. Longitude.
Glos. into E. & W. by the Thames Canal and the Severn.
Lancs. into N. & S. by the River Ribble.
Yorks. is divided into 5, S.E. is E. Riding; S.W. and Mid-West are W. Riding; S. & N. of a horizontal through Leeds; N.E. and N.W. are N. Riding divided vertically from Borough Bridge.
Lincs. is divided into N. & S. by the river Witham.
Northumberland S. is separated from Cheviotland by the river Coquet.

Scotland is treated differently. Small adjacent counties of low population have been merged to form one area:
Banff with Elgin.
Wigtown with Kirkcudbright.
Peebles with Selkirk.
Berwick with Roxburgh are combined in this way.
The three Lothians comprise one area.
Inverness, however, on account of its size is divided into E. & W. by a line crossing the county in a westerly direction from Laggan.
Wales has received the same treatment as Scotland:
Denbigh with Flint.
Montgomery with Merioneth.
Brecon with Radnor, are combined.

For the adoption of these areas, which are very similar in size I am greatly indebted to the New Naturalist Vice-County map of the British Isles which can be obtained from the botanical department of Cambridge University.

TABLE

SHOWING GEOGRAPHICAL DIVISIONS AND PREVALENCE RATE

Divisions	*Prevalence rate*
ENGLAND, N. (Cumberland, Durham, Northumberland and Westmorland)	1.84 per 1,000
ENGLAND, N.W. (Cheshire and Lancashire)	1.69 per 1,000
ENGLAND, N.E. (Lincolnshire and Yorkshire)	1.50 per 1,000
ENGLAND, MIDLANDS (Derby., Hereford., Hunts., Leics., Notts., Northants., Rutland., Salop, Staffs, Warwicks. Worcs.)	1.10 per 1,000
ENGLAND, S.W. (Berks., Cornwall, Devon, Dorset, Glos., Hants., Oxfords., Somerset, Wilts.)	1.04 per 1,000
ENGLAND, S.E. (Bedford, Bucks., Cambridge, Essex, Herts., Kent, London, Middlesex, Norfolk, Suffolk, Surrey, Sussex)	.85 per 1,000
SCOTLAND	1.80 per 1,000
WALES	1.53 per 1,000
ENGLAND (as a whole)	1.19 per 1,000
GREAT BRITAIN (as a whole)	1.27 per 1,000