Conclusions

Clinicians and those involved in service development sometimes dismiss academic research because of an "ivory tower" approach that pays too little attention to issues around service delivery.[22] The nature of negotiated access to research subjects in primary care settings can have a direct effect not only on participation rates in research but also on the quality of the research data.[23] If a trial is to be executed successfully, and its findings are to be applicable in a service setting, it is important to identify a trial design that can best reconcile the interests of research, development, and practice. Our analytical framework provides an approach by which it is possible to explore how particular characteristics of trial design appear from each perspective and thereby to assess the most satisfactory design options. The approach cannot assure that trial design will be straightforward and problem free, but early consideration of the perspectives of research, development, and practice might help to prevent fundamental problems arising later.

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Contributors: AH and IN had the original idea for a trial. SR was overall coordinator of both design and execution of the exploratory trial, organised recruitment of the study practices, and developed packs of evidence based guidelines. CH and ZT designed and executed the qualitative component of the study. IN and SL developed and implemented the intervention strategies used in the feasibility study. SR, C Hill, and S Goubet developed the quantitative outcome measures. The steering group for the study comprised the authors, S Goubet, and C Hill. L Klinger, J Hickling, and M Griffin assisted with collection, checking, or analysis of data. Advisors to the project included M Vickers, M Lawrence, S Thompson, P Greenhalgh, S Ebrahim, and J Roberts. M Modell, R Morris, and D Mant (who was an external reviewer) gave valuable comments on earlier drafts of this paper. SR is the guarantor for the paper.

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1 Oxman AD, Thomson MA, Davis DA, Haynes RB. No magic bullets: a systematic review of 102 trials of interventions to improve professional practice. *Can Med Assoc J* 1995;153:1423-31.
2 Effective Health Care. *Getting evidence into practice.* York: University of York, 1999.
3 Lawrence M, Packwood T. Adapting total quality management for general practice: evaluation of a programme. *Qual Health Care* 1996;5:151-8.
4 Hearnshaw H, Reddish S, Carlyle D, Baker R, Robertson N. Introducing a quality improvement programme to primary healthcare teams. *Qual Health Care* 1998;7:200-8.
5 Wyatt JC, Paterson-Brown S, Johanson R, Altman DG, Bradburn MJ, Fisk NM. Randomised trial of educational visits to enhance use of systematic reviews in 25 obstetric units. *BMJ* 1998;317:1041-6.
6 Solberg LI, Kottke TE, Brekke ML. Will primary care clinics organise themselves to improve the delivery of preventive services? A randomised controlled trial. *Preventive Med* 1998;27:623-31.
7 Goldberg HI, Wagner EH, Fihn SD, Martin DP, Horowitz CR, Christensen DB, et al. A randomized controlled trial of CQI teams and academic detailing: can they alter compliance with guidelines. *Jt Comm J Qual Improv* 1998;24:130-42.
8 Shortell SM, Bennett CL, Byck GR. Assessing the impact of continuous quality improvement on clinical practice: what will it take to accelerate progress? *Milbank Quarterly* 1998;76:593-624.
9 Cochran and Cox. *Experimental designs.* New York: Wiley, 1957.
10 Altman DG. *Practical statistics for medical research.* London: Chapman and Hall, 1991.
11 Medical Research Council General Practice Research Framework. *A network of general practices throughout the UK managed by the MRC Epidemiology and Medical Care Unit.* London: EMCU, Wolfson Institute of Preventive Medicine, 1997.
12 Neufield VR, Woodward CA, McLeod SM. The McMasters MD programme: a case study in renewal in medical education. *Acad Med* 1989;64:423-32.
13 Berwick D. A primer on the improvement of systems. *BMJ* 1996;312:619-22.
14 Tomlin Z, Humphrey C, Rogers S. General practitioners' perceptions of effective health care. *BMJ* 1999;318:1532-5.
15 Stephens R, Gibson D. The impact of clinical trials on the treatment of lung cancer. *Clin Oncol* 1993;5:211-9.
16 Brewin CR, Bradley C. Patient preferences and randomised clinical trials. *BMJ* 1989;299:313-5.
17 Anderson NR, West MA. *The team climate inventory: manual and users guide.* Windsor: Assessment Services for Employment/National Foundation for Educational Research-Nelson Press, 1994.
18 Pritchard P, Pritchard J. *Teamwork for primary and shared care.* Oxford: Oxford University Press, 1994.
19 Sibley J, Sackett DL, Neufeld V, Gerrard B, Rudnick KV, Fraser W. A randomized trial of continuing medical education. *N Engl J Med* 1982;306:511-5.
20 Bradley F, Wiles R, Kinmonth A-L, Mant D, Gantley M. Development and evaluation of complex interventions in health services research: case study of the Southampton heart integrated care project. *BMJ* 1999;318:711-5.
21 Schwarz D, Lellouch J. Explanatory and pragmatic attitudes in therapeutic trials. *J Chronic Dis* 1967;20:637-48.
22 Dawson S. Inhabiting different worlds: how can research relate to practice? *Qual Health Care* 1997;6:177-8.
23 Murphy E, Spiegal N, Kinmonth AL. "Will you help me with my research?" Gaining access to primary care settings and subjects. *Br J Gen Pract* 1992;42:162-5.

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Use of statins in general practices, 1996-8: cross sectional study

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The rationale for prescribing statins is well established.[1] Recently there has been an increase in the rate of prescribing of lipid lowering drugs, although large variations remain between practices.[2] Fewer prescriptions are written in practices in more deprived areas[3]; it is not clear what effect local guidelines have on such inequalities. The aim of this study was to describe changes in the rate of prescribing statins between general practices after the introduction of national and local guidelines.

Methods and results

The study population included 110 of 118 general practices in Nottingham. The main reason for excluding practices was poor quality data. Townsend scores, which measure deprivation on a scale of 4.8 (most deprived) to −3.6 (least deprived),[4] were derived for practices using the weighted sum of census information from enumeration districts for patients registered with each practice. Data from prescribing and cost reports were collected over three six-month periods from 1 April to 30 September in 1996, 1997, and 1998. Average daily quantities were used to determine the daily dose of statins prescribed and were expressed as a rate (statin-years) of prescribing per 1000 patients aged 35-69. Variables were logarithmically transformed; multiple linear regression was used to examine the relation between prescribing and deprivation by adjusting for list size,

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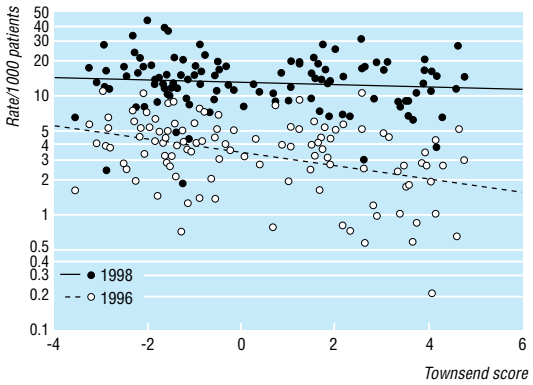

Relation between Townsend score of each practice and rate of statin prescribing per 1000 patients aged 35-69 in 1996 and 1998. Regression lines show unadjusted analyses

practice status (training or fundholding or both), the number of general practitioners, total admissions standardised for age, rates of admissions and outpatient referrals, and the cost of all cardiovascular drugs excluding lipid lowering drugs.

During 1996, the rates of prescribing statins varied from a median of 3.8 statin-years per 1000 adults overall and a median of 4.9 in the quintile of practices classed as least deprived to a median of 2.0 in the quintile classed as most deprived. These rates increased in 1998 to a median of 13.2 statin-years among all practices and to a median of 15.3 in the least deprived quintile and 10.8 in the most deprived. In each year practices in the most deprived areas had lower rates of prescribing than those in more affluent areas.

In 1996 there was a significant inverse relation between deprivation and rates of prescribing statins, with the Townsend score explaining 14% of the variation after adjustment for the costs of cardiovascular drugs and practice population aged 35-69 years ($P < 0.0005$). In 1997 and 1998, proportionally larger increases in prescribing occurred among practices in more deprived areas; no significant relation between deprivation and prescribing rates was found during this time. Using Townsend scores of +3 and −3 to represent practices in deprived and more affluent areas, we found a 63% greater increase in prescribing statins among practices in deprived areas compared with those in more affluent areas between 1996 and 1997 and an 88% greater increase between 1997 and 1998 (figure).

Comment

The prescription of statins in primary care in Nottingham increased fourfold between 1996 and 1998; the greatest increase occurred in the most deprived areas. The data precluded assessment of the needs of individual patients.[5] It is possible that patients in practices in deprived areas and patients in more affluent areas differed in their access to medical care, resulting in a lower level of prescribing in more deprived practices. The appropriateness of prescribing was not assessed; local guidelines on statins focused mainly on secondary prevention but we were not able to assess whether the reduction in the difference between the practices was due to the use of statins in secondary prevention.

We do not know whether the observed pattern of prescribing will change or whether the use of statins by practices in more deprived areas will continue to increase at different rates depending on the level of deprivation. A more detailed study is warranted to establish whether changes in prescribing were the result of the introduction of new guidelines in late 1996, increasing familiarity with statins, or an improved awareness of statins among practitioners in the most deprived areas.

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1 Scandinavian Simvastatin Survival Study Group. Randomised trial of cholesterol lowering in 4444 patients with coronary heart disease: the Scandinavian simvastatin survival study (4S). *Lancet* 1994;344:1383-9.
2 Baxter C, Jones R, Corr L. Time trend analysis and variations in prescribing lipid lowering drugs in general practice. *BMJ* 1998;317:134-5.
3 Packham C, Robinson J, Morris J, Richards C, Marks P, Gray D. Statin prescribing in Nottingham general practices: a cross-sectional study. *J Public Health Med* 1999;21:60-4.
4 Townsend P, Phillmore P, Beattie A. *Health and deprivation: inequality in the north.* London: Croom Helm, 1988.
5 Picken DM, Payne JN, Haq IU, McCabe CJ, Ward SE, Jackson PR, et al. *Statin therapy/HMG Co-A reductase inhibitor treatment in the prevention of coronary heart disease: guidance notes for purchasers 96/04.* Sheffield: University of Sheffield, 1996.

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