

Metrics for monitoring local inequalities in access to maternity care: developing a basket of markers from routinely available data

S F Murray,¹ A M Buller,¹ S Bewley,² J Sandall¹

► Additional tables are published online only. To view these files please visit the journal online (<http://qshc.bmj.com>).

¹King's College London, Florence Nightingale School of Nursing and Midwifery, London, UK

²Guy's & St Thomas' Foundation Trust, London, UK

Correspondence to

Dr S F Murray, Florence Nightingale School of Nursing & Midwifery, James Clerk Maxwell Building, 57 Waterloo Road, King's College London, London SE1 8WA, UK; susan_fairley.murray@kcl.ac.uk

Accepted 25 January 2010

Published Online First

4 August 2010

ABSTRACT

Background Equal access for all based on need is part of a conceptualisation of quality underpinning recent UK NHS policies.

Objective To develop metrics for access to maternity care from routinely available data in order to inform inequalities monitoring and commissioning.

Design Cross-sectional cohort design using case-note audit and postnatal questionnaire.

Setting London hospital, UK, in an area of relative socio-economic deprivation.

Methods Stage 1: Identification of potential markers. Stage 2: Testing of markers via case note audit and postnatal questionnaire. Stage 3: Selection of final basket of markers of access to maternity services.

Results Of 71 possible markers identified, 32 used information obtainable from maternity case notes. After testing in the case-note audit, 21 were discarded, and 11 included in the final basket covering: timely entry to maternity care; appropriate assessment and identification of needs of individuals; referral and communication with other related health and social care services.

Conclusion It is possible to devise a local basket of markers covering a range of important entry and in-system access metrics. Such a tool offers an unobtrusive means to audit the effectiveness of some of the processes intended to help women move through the maternity and related health and social care systems during pregnancy, and to monitor progress on reducing social inequalities in access over time.

INTRODUCTION

'Enduring principles of equal access for all based on need'¹ are held to be a key feature of the National Health Service in England as in the other UK countries, and to be part of a conceptualisation of quality that encompasses clinical effectiveness, patient safety and patient experience.¹ Recent government policies also reflect a renewed interest in strategies for reducing inequalities in health.^{2–4}

The London Health Observatory issued a basket of 70 health inequality indicators to help support local action to achieve government national inequalities targets for life expectancy and infant mortality. Drawing upon this approach and concern about early and easy access to maternity services articulated in recent policy documents,^{5–7} our study considers the development of locally usable metrics for access to maternity care.

At its simplest, 'access' to healthcare can be used to refer to whether those who need care 'get into the system or not.'⁸ Where coverage is very high or universal, the focus becomes timely entry into the

system, as recommended by various reports^{7 9 10} and in the Public Service Agreement (PSA) targets.⁷ However, 'healthcare' is seldom a single event, and it is increasingly accepted that access 'concerns the appropriate combination and deployment of resources to facilitate the process of entering *and moving through* the health system' (p 9, our emphasis).¹¹ Similarly, Pechansky and Thomas¹² suggest that 'access' describes the 'degree of fit' between clients and the health system.

During the course of a pregnancy, women in the UK move through a complex system of health and social care. Maternity care cuts across 'community,' 'primary' and 'acute' divides, and encompasses promotion of well-being and physiological processes as well as early detection and treatment of complications. This scenario poses a considerable challenge for the measurement of progress against policy aims for 'easy access' using routinely available data. Our study aimed to identify a group of access markers that would cover a wide range of these issues as reliably as possible,¹³ to include indicators of different aspects of health system performance and to focus on facets of service provision in which social inequalities may be observed.

Recruitment and participants

Ethical and site research and development approval was sought and given for all stages of the study. The design included an 'opt-out' approach^{14 15} with a 24 h answerphone in English, French, Portuguese, Spanish and Somali. Study information posters were displayed at hospital and community clinics, and information packs offered to women at discharge, providing details about the study methods and its implications.

The case note audit cohort comprised all women who received birth care from one NHS Trust (irrespective of home or hospital birth) during a 10-week period (N=1197, table 1). Postnatal questionnaires were sent to those resident within the geographical catchment area but excluding women who had stillbirths or neonatal death. Twenty-one women could not be traced, resulting in a survey subsample of 859 women.

METHODS

Stage 1

We reviewed government policy documents and guidelines,^{16 17} international maternity system quality measures and existing health equity profiling tools and research studies,^{18–23} in order to identify potential utilisation-based markers of access to maternity care (figure 1). Twenty-one

Table 1 Socio-economic and demographic characteristics of audit cohort

Characteristic	Proportions in cohort
Age	
16–19 years	4.6%
20–30 years	45.6%
31–44 years	49.8%
Country of birth classification Using World Bank economies list (www.worldbank.org/data/countryclass/classgroups.htm)	
Low income country	20.4%
Lower middle income country	10.3%
Upper middle income country	4.5%
High income country (including the UK)	57.7%
Socio economic status	
Using Index of Multiple Deprivation (IMD) scores based on postcode of residence ranked within cohort from 'most deprived' to 'least deprived'	Grouped in quintiles

individual and group consultations were conducted. Potential markers were matched against information recorded in the maternity case notes to establish accessibility.

Stage 2

An audit protocol was developed and midwife researchers trained in its use to standardise data collection. Data were

extracted on demographics, postcode and components of the markers. A postnatal survey provided additional validation data regarding meaning, relevance and discriminatory ability of markers. The questionnaire was piloted via cognitive interviewing. For comparisons between groups for each marker, χ^2 tests at the 95% confidence level were run with SPSS statistical software on a merged database with data from both the audit and the survey (SPSS, Chicago, Illinois).

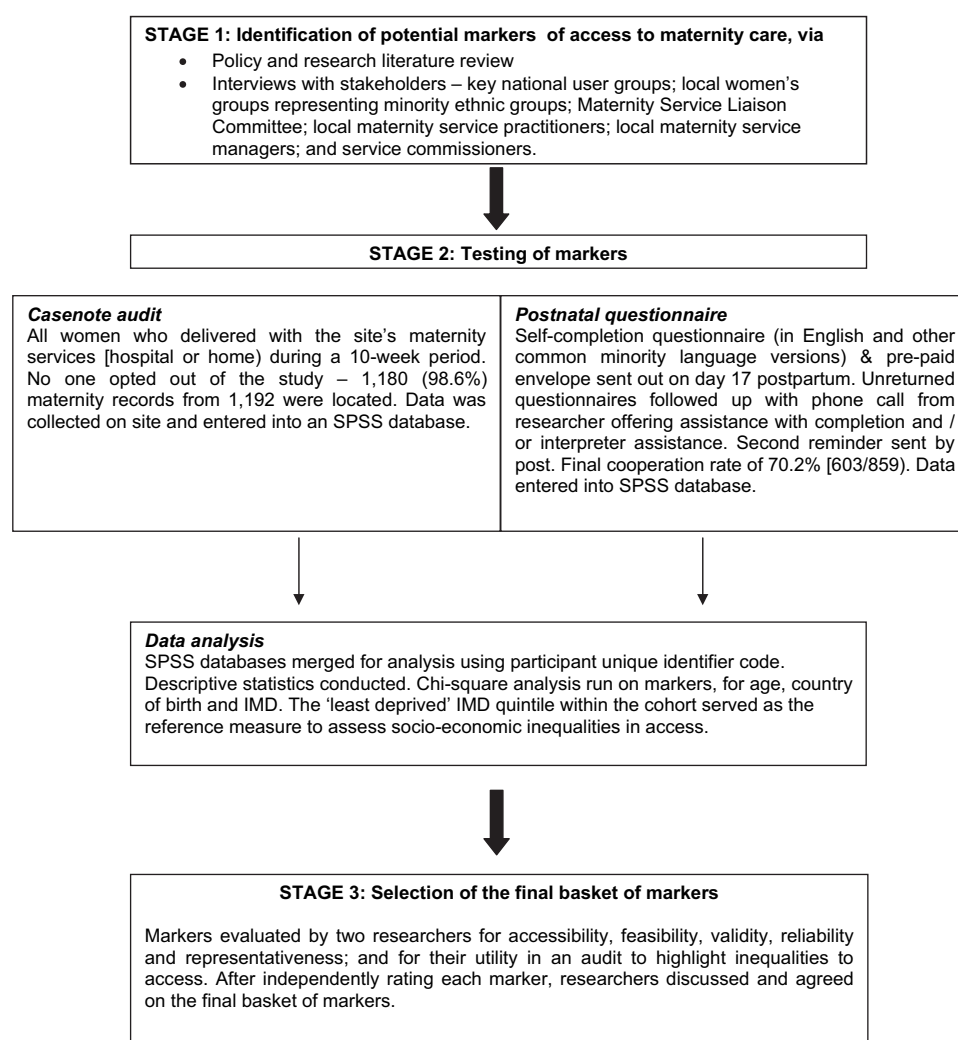
Stage 3

Markers were evaluated using technical criteria, eliminating those that were unreliable due to poor documentation (cut-off: 45% data bits required), had a low occurrence (cut-off 5%) or were infeasible due to overly complex data retrieval. Finally, for inclusion in this basket with its focus on social inequalities, markers either had to be supported by research literature that indicates social differentials in health (eg, for smoking or breastfeeding) or demonstrate statistically significant differences on socio-demographic or economic variables within our study cohort (χ^2 test $p < 0.05$).

RESULTS

Stage 1 produced an initial list of 71 markers. Less than half could be constructed using data solely recorded in the local maternity case notes, and 32 provisional markers were identified, for which information ought to be available. Following stages 2 and 3, a final basket of 11 markers was identified. These are

Figure 1 Flow diagram of methods. IMD, Index of Multiple Deprivation.



detailed below, illustrated with data from the test site. Only statistically significant results are presented.

Markers that were rejected at Stage 3, and reasons for the decision, are detailed in the supplementary table available online. Markers that had to be rejected included infant feeding choice (missing information in 70%); counselling for women requesting caesarean section (2% occurrence rate) and substance misuse (0.4% occurrence rate); anti-D care pathway (too complex to be feasible); care pathways for VBAC and prolonged pregnancy¹ (technically robust but neither demonstrated differential access among subgroups nor reflected areas of known social inequalities in health).

Markers included in the basket

All results presented are significant at the 95% level of confidence ($p < 0.05$).

1. Timely entry into maternity care

Percentage of women who delivered with the service and were 'booked' with it by/before a gestation cut-off date of 12 weeks.¹⁷

- ▶ 43.3% booked later than 12 weeks' gestation
- ▶ Timely entry was more common in:
 - women born in high-income countries than women born in low income countries (59.8%; 45.5%);
 - women with good command of English than women without command of English (61.5%; 47.1%);
 - women in the highest IMD quintile within cohort than those in the lowest (85%; 75.6%).

2. Identification of language needs

Percentage of women who had language needs identified during the 'booking' consultation. This marker indicates coverage but not quality of activity; therefore use is recommended in conjunction with Marker 3.

- ▶ Most women (98%) had language and communication needs recorded by a care provider.
- ▶ Survey results suggest that assessment quality is not always good. Eighteen of 41 survey respondents who said they 'did not feel confident with English' had been classified by their midwife as speaking and understanding English with no problems.

3. Interpreter services provided

Proportion of total number of interactions with health staff during pregnancy; labour and delivery; and discharge for which formal interpreter services were provided:

Of women documented as needing an interpreter:

- ▶ 29% (65) had no recorded interpreter provision;
- ▶ 6% had an interpreter at 50% or more of maternity consultations;
- ▶ No one was provided with interpreting services for all their maternity consultations.

4. Women write in their maternity care plans

Evidence of women's written input into plans about their care in the allocated sections of hand-held case notes:

- ▶ Most women (72%) did not write in their maternity notes.
- ▶ Women in the 'least deprived' IMD quintile were more likely to write in their case notes than those in the, 'most deprived' (38%; 22%).
- ▶ Women born in high income countries were more likely to write in their case notes than women from low income countries 37.9%; 12.9% (no association with command of English).
- ▶ 40% survey respondents reported that they 'did not feel free to write' in their case notes.

5. Minimum required number of antenatal consultations achieved

Proportion of women from whom at least the minimum required number of antenatal care consultations¹⁷ is achieved:

- ▶ 86.7% (767) had at least seven consultations. (Those who had booked after 22 weeks of gestation, delivered before 36 weeks or were transferred in during the pregnancy excluded from this analysis).
- ▶ Women from the 'least deprived' IMD quintile were more likely to have at least seven consultations than those from the 'most deprived' quintile (93.5%; 83.4%).

6. Dental care needs assessed in pregnancy

Percentage of women attending antenatal care for whom dental care needs were assessed, and to whom the FW8²⁴ (maternity exemption form) for free NHS dental care and prescriptions were provided:

- ▶ 94% had dental needs assessed by a maternity care provider.
- ▶ Women with a command of the English language were more likely to have their dental health needs discussed than those without a command of English (96.7%; 88.9%).
- ▶ 50% received the FW8 form from their midwife or obstetrician; 3.7% were recorded as not requiring it.

7. Continuity of carer from antenatal to intrapartum

Percentage of women for whom at least one member of staff providing labour/delivery care was known from antenatal care:

- ▶ 18.5% received care in labour/delivery from a midwife or doctor they knew from antenatal care.
- ▶ Women born in high-income countries (including UK) were more likely to receive care during labour/delivery from a known member of staff than women from low-income countries (20%; 12.9%).
- ▶ Women from the 'least deprived' IMD quintile of the cohort were more likely to receive care from a known member of staff during labour/delivery than those from the 'most deprived' quintile (22.5%; 17.4%).

8. Early initiation of breastfeeding

Percentage of babies breastfed within half an hour of birth:

- ▶ Full information for marker recorded only for 46.5% case notes.
- ▶ Of these, 50.7% initiated breastfeeding within half an hour after birth.

9. Obesity care provided

Percentage of women attending antenatal care for whom the Body Mass Index (BMI) was calculated at booking; those with BMI of more than a specified cut-off who were referred to specialist maternity consultant, dietician and/or anaesthetist:

- ▶ 56.7% had their BMI calculated and recorded in case notes.
- ▶ Women from the 'most deprived' IMD quintile of cohort were more likely than those from the 'least deprived' quintile to have BMI >30 (19.5%; 4.1%).
- ▶ Of 89 women identified as having BMI >30, 57.3% were referred to a specialist maternity consultant, and only four (4.5%) to a nutritionist/dietician.
- ▶ Of those with BMI of >35, 9.7% were referred to an anaesthetist.
- ▶ Only two women were documented as receiving their complete care pathway according to local guidelines.

10. Domestic violence routine enquiry and referral

Percentage of women attending antenatal care to whom an enquiry about domestic violence (DV) was made and recorded;

percentage disclosing DV to healthcare provider; and referred to an advocacy service:

At the time of the audit, a DV service had recently started in the study site.

- ▶ 15% (171) were asked about DV, and 11% of this subgroup (18) revealed violence.
- ▶ For over half (10) revealing violence, there was no record of discussion of referral to the advocacy service.
- ▶ 53% who were asked about DV came from the two 'most deprived' IMD quintiles; 6% came from the 'least deprived' quintile suggesting targeting of enquiry by social group.
- ▶ One year later, a repeat audit showed that routine enquiry rates had reached 47%.²⁵ Coverage was no longer skewed across IMD quintiles.

11. Smoking assessment and referral to cessation support

Percentage attending antenatal care for whom smoking status is assessed and, if needed, smoking cessation support is offered:

- ▶ Women in their teens were more likely to smoke than women over 30 (34.5%; 8.8%).
- ▶ Women in the 'most deprived' IMD quintiles smoked more than those living in the 'least deprived' areas (16.1%; 6.8%).
- ▶ Of 143 women documented as cigarette smokers, only 71.2% had a documented offer of help to quit.

DISCUSSION

Approximately two-thirds of the markers of access that we tested were rejected for the basket on one or more of the technical criteria mentioned above. Poor quality of recording of information in case notes was a factor in rejection of five markers. Eleven markers did not differentiate among subgroups of the population and thus did not offer the insight on differential access that we were seeking. Data for several care pathway markers specific to needs of vulnerable subgroups did not occur with sufficient frequency to be testable in a cross-sectional audit of this size.

The final basket contains five access markers that relate to good practice in routine maternity care provision (markers 1, 4, 5, 7, 8); three concerning appropriate assessment and identification of needs of individuals for specialist services within maternity care (markers 2, 3, 9); and three concerning referral and communication with other related health and social care services (markers 6, 10, 11). This offers managers and commissioners a means to assess a range of processes intended to help women move through maternity and related health and social care systems during pregnancy, and to monitor these for improvements over time. It includes markers that highlight some of the different social characteristics that have a bearing on entry and in-system access such as socio-economic deprivation, and command of local language.

Case note audit is popular because it is relatively straightforward and inexpensive, and does not interfere with clinical activity or make demands on service users.²⁶ It is easily replicable and lends itself to monitoring changes over time. There are limitations. First, high retrieval rates are very important in audits concerned with detecting inequalities in access, and this is labour-intensive. Second, case note audit captures little about access barriers to NHS care encountered by women outside the system such as those classified as 'not normally resident'.²⁷ Third, it inevitably confines enquiry to the perspectives of those authorised to write in the records, and is highly dependent on the type and quality of information they record. Audit does not allow easy discrimination between poor recording of activity and inadequate provision of information or services.

However, there is likely to be some relation between the two. Poor documentation in an area—such as that of initiation of infant feeding—may serve to flag up a need for further investigation.

Our findings indicate that some, but by no means all, dimensions of access to high-quality care can be measured through case note audit.²⁸ Other complementary methods of data collection are thus important, such as patient surveys used to quantify different aspect of access,^{29–31} and qualitative studies of the views of patient experiences across the interface between primary and secondary healthcare.³²

There has been a recent upsurge of interest in tools to monitor maternity service performance at the national level. The Healthcare Commission, for example, recently introduced a 25-indicator scoring assessment for its national maternity reviews.¹⁰ Our basket of markers for use in internal case-note audit complements this activity. It has a far more specific focus—markers that will reflect relative entry-access and in-service access within populations, and it is designed for local use by service managers or commissioners.

As with other baskets of indicators for monitoring health inequalities, local adaption may be necessary, and users may wish to select from the basket or to supplement with additional locally available and relevant indicators. This version of the basket was developed in a site serving a highly mobile multi-ethnic urban population. Future research will be required to test and adapt the tool for use in other settings.

Acknowledgements We thank the women who permitted their case notes to be reviewed and who completed the survey questionnaires; the members of stakeholder groups who contributed to the marker selection process; the interpreters who facilitated the survey; midwife researchers M Callaghan, C Momoh and C Singh for input on the design of tools and for conducting the data extraction for the case-note audit; P Khng for administrative support; M Ahmed, intern, for research assistance; R Steinbach for statistical advice; and L Bacchus, who advised on Domestic Abuse routine enquiry.

Funding Funded by a grant from Guy's and St Thomas' Charity Quality of care research programme (reference No R031111p2). The authors' work was independent of the funders, who had no role in the study design, analysis of data, writing of the manuscript, or decision to submit for publication.

Competing interests None.

Patient consent Obtained.

Ethics approval Ethics approval was provided by the Trust Hospital R&D process and Ethics Committee (St Thomas' Hospital REC ref. 05/Q0702/127).

Contributors SFM had the idea for the study and drafted the paper with contributions from all authors. AMB and SFM conducted stakeholder consultation, designed and piloted the tools, and wrote marker statements. AMB led the data-collection team, established and cleaned the database, and conducted statistical analysis with inputs from SFM. SB and JS provided specialist advice during the process of the project design and implementation, and read and critiqued the draft of the final marker report.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

1. Darzi A. *High quality care for all: NHS next stage review final report*. London: Department of Health, 2008.
2. Department of Health. *World class commissioning: vision*. London: Department of Health, 2007.
3. Health Select Committee. *House of commons health select committee on health inequalities 2007–8*. London: The Stationary Office Limited, 2008.
4. Department of Health. *Tackling health inequalities. A programme for action*. London: Department of Health, 2003, Report No: 32366.
5. Department of Health, Partnerships for Children FaM. *Maternity matters: choice, access and continuity of care in a safe service*. London: Department of Health, 2007.
6. Healthcare Commission. *Towards better births A review of maternity services in England*. London: Healthcare Commission, 2008.
7. HM Government. *PSA delivery agreement 19: ensure better care for all*. London: The Stationary Office, 2007.
8. Aday L, Andersen R. *Development of indices of access to medical care*. Ann Arbor: Health Administration Press, 1975.

9. **Bowles C**, Walters R, Jacobsen B. *Born equal? A report on inequalities in infant mortality in London. A technical report*. London: London Health Observatory, 2007.
10. **Healthcare Commission**. *Scoring the maternity service review*, 2007.
11. **Gulliford M**, Morgan M, eds. *Access to health care*. London: Routledge, 2003.
12. **Pechansky R**, Thomas J. The concept of access: definition and relationship to consumer satisfaction. *Med Care* 1981;**19**:127–40.
13. **Pencheon D**. *The good indicators guide*. Coventry: APHO/NHS Institute for Innovation and Improvement, 2008.
14. **Junghans C**, Feder G, Hemingway H, *et al*. Recruiting patients to medical research: double blind randomised trial of 'opt-in' versus 'opt-out' strategies. *BMJ* 2005;**331**:940.
15. **Li DK**, Liu L, Odouli R. Exposure to non-steroidal anti-inflammatory drugs during pregnancy and risk of miscarriage: population based cohort study. *BMJ* 2003;**327**:368.
16. **Department of Health**. *Maternity Standard, National Service Framework for Children, Young People and Maternity Services*. London: DH, 2004.
17. **National Institute for Clinical Excellence**. *Antenatal care: routine care for the healthy pregnant women*. London: RCOG Press, 2003.
18. **Department of Human Services**. *Measuring maternity care. The final set of performance indicators—2002. (Part 2)*. Melbourne: Department of Human Services, State Government of Victoria, 2002.
19. **CEMACH**. *Why mothers die 2000–2002. The sixth report of the confidential enquiries into maternal deaths in the United Kingdom*. London: RCOG Press, 2004.
20. **D'Souza L**, Garcia J. Improving services for disadvantaged childbearing women. *Child: Care Health Dev* 2004;**30**:599–611.
21. **Hemingway H**, Saunders D, Parsons L. Social class, spoken language and pattern of care as determinants of continuity of care in maternity services in east London. *J Public Health Med* 1997;**16**:156–61.
22. **Petrou S**, Kupek E, Vause S, *et al*. Clinical provider and sociodemographic determinants of the number of antenatal visits in England and Wales. *Soc Sci Med* 2001;**52**:1123–34.
23. **Rowe Rachel**, Garcia Jo. *Evidence on access to maternity and infant care in England*. London: National Perinatal Epidemiology Unit and Maternity Alliance, 2003.
24. **Healthcare Commission**. *State of healthcare 2008*. Norwich: The Stationery Office; 2008, Report No: HC 11, 2008–09.
25. **Bacchus L**, Aston G, Torres Vitolas C, *et al*. *A theory-based evaluation of a multi-agency domestic violence service based in maternity and genitourinary services at Guy's & St Thomas' NHS Foundation Trust*. London: King's College London, 2007.
26. **Lilford R**, Edwards A, Girling A, *et al*. Inter-rater reliability of case-note audit: a systematic review. *J Health Serv Res Policy* 2007;**12**:173–80.
27. **Joint Committee on Human Rights PGB**. *The treatment of asylum seekers: tenth report of session 2006–07. Vol. 1*. London: The Stationery Office, 2007.
28. **Beake S**, McCourt C, Page L, *et al*. The use of clinical audit in evaluating maternity services reform: a critical reflection. *J Eval Clin Pract* 1998;**4**:75–83.
29. **Grogan S**, Conner M, Norman P, *et al*. Validation of a questionnaire measuring patient satisfaction with general practitioner services. *Qual Health Care* 2000;**9**:210–15.
30. **McKinley RK**, Roberts C. Patient satisfaction with out of hours primary medical care. *Qual Health Care* 2001;**10**:23–8.
31. **Calnan M**, Dickinson M, Manley G. The quality of general dental care: public and users' perceptions. *Qual Health Care* 1999;**8**:149–53.
32. **Preston C**, Cheater F, Baker R, *et al*. Left in limbo: patients' views on care across the primary/secondary interface. *Qual Saf Health Care* 1999;**8**:16–21.