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**To cite this article:** Bjørn Backe & Geir Jacobsen (1994) General practitioners' compliance with guidelines for antenatal care, Scandinavian Journal of Primary Health Care, 12:2, 100-105, DOI: [10.3109/02813439409003683](https://doi.org/10.3109/02813439409003683)

**To link to this article:** <https://doi.org/10.3109/02813439409003683>



Published online: 12 Jul 2009.



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# General practitioners' compliance with guidelines for antenatal care

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**Backe B, Jacobsen G. General practitioners' compliance with guidelines for antenatal care. Scand J Prim Health Care 1994;12:100-5.**

**Objective** – To assess general practitioners' compliance with Norwegian guidelines for antenatal care issued in 1984 and to identify characteristics of physicians with low compliance.

**Setting** – Routine clinical practice in primary care.

**Study population** – All women permanently residing in the county of Oppland who gave birth during a 12-month period 1988-89 and the general practitioners who provided their antenatal care.

**Methods** – The content of the care was assessed from nine procedures, the selection of which was based on a previous perinatal audit. A 'compliance score' was established and logistic regression analysis was used to estimate pregnant women's odds for a low score by characteristics of their care-providing GPs.

**Results** – GPs' compliance with the guidelines was lower for procedures which required recording of a clinical judgment. The odds for a low score increased significantly if the doctor was a male or worked in a single rather than a group practice. There was no association between compliance score and fetal outcome, or between compliance score and the effectiveness of antenatal care measured as the detection of major obstetric disorders.

**Conclusion** – The gender specific differences in GPs' antenatal care performance were the same as those reported by others. These findings warrant further research.

**Key words:** antenatal care, compliance, clinical guidelines.

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Unlike other Nordic countries, antenatal care in Norway has typically been provided by community general practitioners (GP), and most pregnant women will first encounter secondary care when labour starts and they arrive at a hospital.

In the early 1980s, antenatal care in Norway came into focus for two reasons. First, perinatal mortality rates did not follow the same favourable trend as in the other Nordic countries, with higher stillborn rates identified as the main contributing

factor (1). Second, a perinatal audit concluded that about 30 % of perinatal deaths were 'possibly avoidable', and suboptimal antenatal care was claimed in 46 % of fatal cases (2). Members of the audit panel were commissioned to scrutinize antenatal care and suggest remedial action. Their Official Report (3) included new antenatal care guidelines, which were approved by the Directorate of Health. The guidelines and a new standardized record were introduced to all doctors and

midwives engaged in antenatal care. Following a consensus conference, the Directorate of Health later recommended that pregnant women be offered one ultrasound examination at gestational week 17-19 (4).

The antenatal record is kept by the woman and has a didactic design. Hence, when it is appropriately completed, essential aspects of care have been in accordance with the guidelines.

The purpose of the present study was to document to what extent the guidelines were followed and to identify characteristics of compliant and non-compliant GPs.

## Material

During a 12-month period (March 1988 – February 1989) information about all deliveries in Oppland county (182 000 inhabitants) was recorded prospectively. Data sources were the standardized antenatal and hospital records.

Of the 1908 women who delivered during the study period, 866 (45.4 %) delivered their first and 693 (36.3 %) their second baby. The mean maternal age was 27.5 (16-44) years, the average gestational age 39.9 (24-50) weeks, and the mean birthweight 3547 (470-5280) grams.

With the exception of 12 premature deliveries that took place at the regional hospital and 46 women who incidentally gave birth elsewhere, the material comprises all deliveries in the county.

About 180 GPs were engaged in antenatal care during the study period. Whereas 78 % of the women saw the same doctor at every visit, 17 % were cared for by two, and 5 % by more than two GPs, respectively. Information about the doctors was obtained from the community medical officers. We excluded interns and GPs who were not in active practice during the whole period and women who had been cared for by private obstetricians or one of the obstetrical departments. This left a sample of 1574 women (82 %) and 137 GPs who on average had managed 11.5 pregnancies (1-86; median 8). The main characteristics of the GPs are summarized in Table I.

## Methods

The perinatal audit had identified several areas of deficient antenatal care (2). The nine most frequent procedures (Table II) were selected for the

Table I. Background characteristics of 137 doctors providing antenatal care to 1574 women.

	Proportion in %
Working part-time	7
Fixed salary	59
Female	22
Specialist in general practice	39
Group practice	74
Age:	
30-39	46
40-49	31
50-59	12
Yearly number of pregnant patients:	
1- 4	27
5- 9	33
10-19	27
20-29	8
30 (+)	4

analysis and the antenatal record disclosed whether the procedure had been performed by the GP. Based on exact definitions for each procedure, compliance was counted as one and non-compliance as zero. Thus, a 'compliance score' was obtained that ranged from zero to nine.

All records were assessed by one of three persons (a midwife and two obstetricians). In order to test the reproducibility, they went through 107 records independently, and more than 90 % of the cases were assigned the same compliance score +/- one.

Data were analysed with the Statistical Package for Social Sciences (SPSS/PC+, SPSS Inc. Chicago, Ill). Logistic regression analysis was used to study the relation between characteristics of the GPs and the compliance score. The compliance score was dichotomized for the logistic regression analysis and a high score was defined as values above six. Chi-square tests, t-tests, and Wilcoxon rank sum tests were performed with  $p < .05$  as the level of significance.

## Results

On average, there were 10.8 antenatal visits in primary care (0-22; median 11). Two women received no antenatal care. A statistically significant difference was found between primiparae and parous women (11.0 and 10.6 visits, respectively;  $p = 0.002$ ). In addition, there were on aver-

**Table II.** Procedures by which antenatal care was assessed. The percent of pregnant women where antenatal care was appropriate is stated,  $n=1908$ .

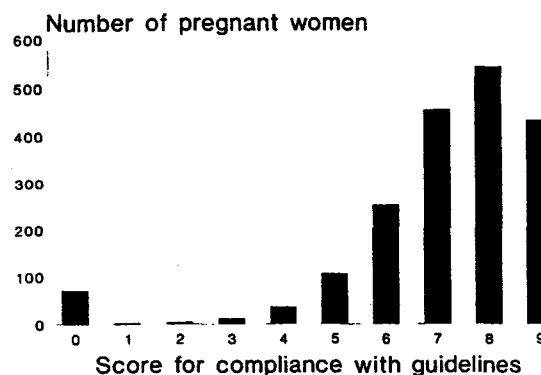
Procedure	Compliance
1. The mother brings the record to the hospital	95 %
2. Social anamneses adequately recorded	90 %
3. Obstetrical anamneses adequately recorded	86 %
4. Smoking habits recorded	96 %
5. Medical history adequately recorded	67 %
6. Gynaecological examination performed in first 1/3	61 %
7. Term of delivery assessed as reliable or unreliable	55 %
8. Symphysis-fundus measurements from week 16	88 %
9. Fetal position recorded from week 34	79 %

age 1.9 (0-15) outpatient obstetrical visits. This, however, included the ultrasound screening, which was performed on 96.6 % of the women.

The distribution of the compliance score is shown in Figure 1. For the 72 women (3.8 %) with a zero score, the antenatal record was not available when they were admitted for labour and was not provided during the stay. More primiparae failed to bring their record to the hospital (8.3 % vs 2.1 %;  $p < 0.001$ ).

Women with no previous births tended to have lower scores, but the difference was not significant. The social and obstetrical histories were adequately recorded in 90 % and 86 %, respectively, while the reliability of the menstrual term had been assessed by only 55 % of the GPs (Table II).

The low score group comprised about 25 % of the women. In the logistic regression analysis, the only GP characteristics that significantly influenced the women's odds for a low score were the doctor's gender (male vs female) and type of practice (i.e. single vs group). Thus, the odds for a low score increased by 33 % if the antenatal care had been provided by a male GP (odds ratio 1.33, 95 % confidence interval 1.04 – 1.71). Similarly, the odds for a low score were raised by 58 % when the GP worked in a single practice (odds ratio 1.58, 95 % confidence interval 1.24 – 2.01). There was no interaction between these variables. The increased odds for a low score among male GPs were due to a lower compliance for symphy-



**Fig. 1.** Distribution of the score for compliance with the guidelines for antenatal care ( $n=1908$ ).

sis fundus (SF) height measurements ( $p = 0.02$ ) and medical history recording ( $p = 0.04$ ). The GPs who worked in a single practice showed a lack of compliance for SF height measurements ( $p < 0.001$ ), and recording of fetal position ( $p < 0.001$ ) and smoking history ( $p = 0.003$ ).

The detection rate of the most common disorders in pregnancy did not differ between women with a high and low compliance score (5,6).

## Discussion

When the standardized antenatal record is used to assess the quality of care, underreporting of procedures performed and clinical observations made by the care provider must be considered. Three factors underline the importance of appropriate use of the antenatal record. First, it is the only tool of communication between primary and specialist care for the majority of women. Second, the record should confirm that the woman has received the care to which she is entitled. Third, compliance with the guidelines is a minimum requirement in relation to quality assurance.

Continuity of care was nearly optimal since four out of five women were examined by the same doctor at every visit. Yet, with an average of 10.6, the recommended number of antenatal visits for healthy parous women was obviously exceeded. A similar reduction in the number of routine controls has been suggested by others (7-9). If more of the care should be aimed at pregnancies with the greatest needs, steps must be taken to reallocate the resources.

Number of visits has for long been used to characterize adequacy of antenatal care (10). A refinement was later introduced in the USA when adjustment was made for gestational length. Still, no firm conclusion can be drawn about the correlation between quantity of care and pregnancy outcome (10). As the recommended number of visits varies from five to 15 throughout Europe (11), it should indicate that the number *per se* is a poor quality index.

Fernandez constructed a score for the adequacy of antenatal care (12) which regarded six procedures, i.e. maternal height and weight, blood pressure, urine and blood samples, and pelvic examination. A similar approach has been used by others (13). We selected a number of procedures which were considered critical for the quality of care by a Norwegian panel of experts (2). Following recent research (14), maternal smoking was weighted, but none of the other procedures due to lack of knowledge about their relative importance.

There may be different views about the relevance of our selection of procedures. For example, the 96.6 % compliance with ultrasound screening may reflect that GPs regard it as an essential part of antenatal care. Also, our figures agree well with a recent national survey (4). However, the 1980 audit panel did not include lack of referral for ultrasound screening on their list of substandard performance (2). Another panel today may have had a different opinion.

Symphysis fundus height measurements were regularly recorded in 88 % of our women, which compares with 76 % in a previous Norwegian study (15). Much attention has been focused on the antenatal identification of SGA (small for gestational age) fetuses, which may explain the high compliance with this procedure.

Medical history was inadequately recorded in 1/3 of the women due to a deficient recording of alcohol intake. One possible reason for this omission is that doctors may feel like moralizers when they ask pregnant women how much they drink.

The question about smoking was answered by 96 % of the women. That issue may be less emotionally charged, and smoking is apparently easier to quantify than drinking. It may also reflect the present consensus that smoking is harmful (16), whereas the negative impacts of maternal alcohol

use are less well documented (17). However, the main reason for asking these questions lies beyond obtaining statistical information. In addition to the opportunity to influence negative health habits, the standardized record also enables the care provider to identify women with additional needs for social support.

Compliance was lower where the physician must record a clinical judgment, e.g. the reliability of the term based on the last menstrual period or the assessment of uterine size after a pelvic examination. Despite the introduction of ultrasound for gestational dating, a clinical judgment may still be helpful for the optimal timing of the routine scan (18).

Logistic regression analysis required that the compliance score was dichotomized. When score values of five and four, instead of six, were used as cutoff levels, the low score group was reduced to 12 % and 7 %, respectively. Still, this did not alter the main findings. Similarly, different ways of categorizing age and annual number of pregnant patients per GP did not change the results.

The observed association between doctor's gender and compliance agrees with another report (19), but that study made no attempt to control for confounding variables. Our results indicated that the less optimal performance of male GPs was due to a lower compliance for symphysis fundus height measurements (19). One might speculate whether male GPs have a different attitude to pregnant patients than their female colleagues, or whether their practices differ in general. We have no indication that the characteristics of pregnant patients differed between our male and female doctors. One female GP had a disproportionately large number of pregnancies (86), but reanalysis of the data without her patients did not change the results.

GPs working in a single practice may develop other documentation routines than those who work in a group. Shared care of patients and discussions between colleagues may enhance the need for more comprehensive and complete records. Groups have to a great extent replaced single practices over the last 20 years. Yet, no hard evidence shows that a group practice is superior in securing optimal quality of care. One study found that GPs working in a solo practice had a more decisive problem-solving style (20) which may imply that they represent a selected group.

Differences in compliance may also relate to different weight given by health authorities to various aspects of antenatal care. For instance, no significant efforts have been made to reduce the number of visits for healthy parous women. By contrast, the issue of ultrasound screening has received a lot more attention from health authorities, professionals, and pregnant women alike.

Like Fernandez (12), we failed to find a correlation between compliance score and pregnancy outcome. It remains a challenge to document the impact of adequate antenatal care on maternal and fetal outcome (10). A standardized record may overemphasize the medical aspects of antenatal care and other important information about the pregnant woman may be overlooked (21). Guidelines based on the 'conventional wisdom' about good clinical practice, may limit research and development. Future studies in antenatal care should, thus, address the adequacy of such guidelines.

## Acknowledgements

Financial support for the study was obtained from the Royal Norwegian Department for Social Affairs and the Norwegian Research Council for Science and the Humanities.

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Received March 1993

Accepted November 1993