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## Impact on maternity professionals of novel approaches to clinical audit feedback

### Abstract

We compared three approaches to feedback of clinical audit findings relating to miscarriage in 15 Scottish maternity services (printed report alone; report plus *Action Planning Letter*; report plus face-to-face *Facilitated Action Planning*). We surveyed clinicians to measure Theory of Planned Behaviour constructs (in the context of two audit criteria) before and after feedback (n=253) and assessed perceptions of the audit through in-depth interviews (n=17). Pre-feedback, clinicians had positive attitudes and strong subjective norms and intentions to comply, although perceived behavioural control was lower. Generally, positive attitudes, subjective norms and intentions increased after feedback but for one of the two criteria (providing a 7-day miscarriage service), perceived behavioural control decreased. No changes over time reached statistical significance and analysis of covariance (adjusting for pre-feedback scores) showed no consistent relationships between method of feedback and post-feedback construct scores. Interviews revealed positive perceptions of audit but frustration at lack of capacity to implement changes. While interventions which increased intensity of feedback proved feasible and acceptable to clinicians, we were unable to demonstrate that they increased intention to comply with audit criteria.

**Key words:** clinical audit; miscarriage; feedback; cluster randomised trial; theory of planned behaviour;

## INTRODUCTION

Audit and feedback continues to be widely used as a strategy to improve clinicians' practice. In 2002, the UK National Institute for Clinical Excellence and Commission for Health Improvement published *Principles for best practice in clinical audit* (National Institute for Clinical Excellence, 2002) and pledged their continuing support for audit as lying 'at the heart of clinical governance'. Although national investment in clinical audit continues, it has not been found to be consistently effective. (Jamtvedt, Young, Kristoffersen, Thomson O'Brien, & Oxman, 2003) A Cochrane Review on audit and feedback showed a median decrease in non-compliance with recommended practice of only 7%. (Jamtvedt et al., 2003) Despite this very modest effect, audit and feedback can be effective in some circumstances, with reductions in non-compliance of up to 71% in individual trials. (Mayer et al., 1998) There is limited understanding of factors or characteristics [other than low base-line compliance (Jamtvedt et al., 2003)] which are associated with successful audit. On theoretical grounds, certain characteristics associated with higher 'intensity' of feedback would be expected to have a greater capacity to change clinician behaviour. For example, feedback directed at an individual recipient (rather than a group) and verbal feedback (rather than written) should possess greater 'intensity'. (Table 1)

The Scottish Programme for Clinical Effectiveness in Reproductive Health (SPCERH) is well-recognised in Scotland as a professionally-led, peer-review organisation and has undertaken a large number of national clinical audits over more than a decade. (Penney, Glasier, & Templeton, 1994; Penney & Templeton, 1994; Penney, Kitchener, & Templeton, 1995; Penney, Souter, Glasier, & Templeton, 1997; Souter, Penney, Gorman, & Templeton, 1997; Penney, Vale, Souter, & Templeton, 1997; Penney & Pearson, 2000) Our own experience suggests that audit and feedback can be effective, but that at best, the effects are small to moderate. (Penney & Templeton, 1995)

In our previous audits, the standard method of feedback comprised printed reports (which included peer group comparisons) mailed to participating clinicians. We have piloted enhancements to feedback on an empirical basis in individual audits. These enhancements included individualised letters to highlight the particular strengths and weaknesses of local performance, and presentations at continuing professional development meetings.

During 2002/2003, SPCERH undertook a national, criterion-based, clinical audit of the management of miscarriage. A printed report was distributed in May 2003. (Scottish Programme for Clinical Effectiveness in Reproductive Health, 2003) As part of this audit exercise, we developed two novel approaches to increase the intensity of feedback and to highlight the particular strengths and weaknesses of local performance (individualised *Action Planning Letters* and face-to-face *Facilitated Action Planning*).

The theoretical framework for this study was the Theory of Planned Behaviour. (Ajzen, 1991) According to this model, individual behaviour is determined primarily by the strength of *intention* to perform that behaviour. In turn, *intention* is predicted by three constructs: *attitude* towards the behaviour; *subjective norm* (perceived social pressure) to perform the behaviour; and *perceived behavioural control* (perceptions of the ease or difficulty of performing the behaviour, reflecting past experience as well as anticipated barriers and facilitators). The Theory also postulates that *perceived behavioural control* can directly influence behaviour: even if *intentions* are positive, sometimes barriers are so powerful that individuals are unable to act in their intended way.

The purpose of this study was to evaluate the feasibility, acceptability and impact of two interventions which were designed to increase the intensity of clinical audit feedback (individualised *Action Planning Letters* and face-to-face *Facilitated Action Planning*) in comparison with a lower intensity feedback method (distribution of a printed audit report alone). Feedback methods were evaluated in the context of two pre-selected audit criteria relating to miscarriage care: (1) a *dedicated, early pregnancy assessment service should be available daily[including Saturday and Sunday]* and (2) *all women less than 25 years old presenting to early pregnancy services should be tested for Chlamydia trachomatis*. Before-and-after questionnaires permitted quantification of the Theory of Planned Behaviour constructs in the context of these two audit criteria. In addition, in-depth interviews explored clinicians' perceptions of clinical audit in general and of the feedback they had received.

## **METHODS**

### **Setting and sample**

In 2002, we identified all obstetric & gynaecology services in Scotland which provide care for women with miscarriage by reference to routinely-collected data on hospital admissions (SMR01 and SMR02 datasets maintained by Information Services of NHS Scotland). For the purposes of this study, an 'obstetric & gynaecology service' was defined as '*a hospital or hospitals where a distinct team of consultants leads care for pregnant women; intrapartum care is provided in a single, consultant-led labour ward but gynaecology services may be spread over several hospitals*'. We excluded services which cared for less than 30 women with miscarriage per year. On this basis, we identified 25 services eligible for inclusion.

The 25 services were divided into five categories according to their characteristics: university teaching hospitals; large district general hospitals (caring for >250 women with miscarriage annually); small district general hospitals (caring for 30-250 women with miscarriage annually); hospitals serving 'remote and rural' populations; and 'split-site' services.

## **Procedure**

Using computer-generated random numbers, three services were selected from each of the five categories to provide a sample of 15 services considered to be representative of the range of Scottish obstetric & gynaecology services. These 15 services were approached for participation in the Scottish Audit of the Management of Early Pregnancy Loss and all 15 accepted. For feedback of audit findings, the 15 participating services were divided into three groups of five services. Each feedback group included one service from each of the five categories previously described. Stratified allocation to feedback groups was undertaken in a random manner using computer-generated numbers. Thus, each of the three feedback groups was broadly representative of the range of Scottish obstetric & gynaecology services.

The Scottish Audit of the Management of Early Pregnancy Loss has been described in full in our published report. (Scottish Programme for Clinical Effectiveness in Reproductive Health, 2003) In brief: 35 clinical audit criteria were developed from national guidance documents (Scottish Office Department of Health National Medical Advisory Committee, 1996; 1997; Hinshaw & Fayyad, 2000; Anon, 1999; 2000) and published literature; current practice in each of the 15 services was measured using a combination of three audit tools (site visits involving 18 hospitals and 56 interviews; case-note review involving 1258 patient records; and patient survey involving 649 women); all participating staff received feedback in the form of the printed report. (Scottish Programme for Clinical Effectiveness in Reproductive Health, 2003)

## **Feedback methods**

### *Printed report*

One feedback group of five services received the published report only. (Scottish Programme for Clinical Effectiveness in Reproductive Health, 2003) These services were designated 'Controls'. The report summarised audit findings in relation to all 35 audit criteria. It included anonymised service-level data; services were identified by means of a number so that staff in each service could identify their own results and compare their performance with that of their peer group services.

### *Action planning letter*

In addition to the printed report, the second group of five services received an intervention designed to increase the intensity of feedback while keeping resource implications to a minimum. In each of these services, the designated lead consultant for the care of women with miscarriage received an 'Action Planning Letter' prepared by SPCERH. The letter identified specific strengths and specific challenges for the local service, and made suggestions for three aspects of care which warranted change. It was suggested that the lead clinician might wish to discuss the content of the letter with his colleagues. These services were designated the 'Letter group'.

### *Facilitated action planning*

In addition to the printed report, the third group of five services received an intervention designed to increase the intensity of feedback which carried greater resource implications. This intervention was designed to combine the benefits of individual feedback (or 'academic detailing') and verbal group feedback to wider stakeholders in the local service. We termed this intervention 'Facilitated Action Planning'. It involved two meetings in each service facilitated by senior, medically qualified members of the SPCERH team:

- 1 An 'academic detailing' meeting with key staff (the lead consultant for miscarriage care accompanied in some services by a senior midwife). The objectives were to preview the audit data and agree three areas for change.
- 2 An 'action planning' meeting with all relevant staff, including managers. The objectives were to undertake a formal diagnostic analysis of barriers to change (University of York.NHS Centre for Reviews and Dissemination & Group, 1999) for each of the three areas and agree time-specific goals with designated staff responsibility for these.

These services were designated the 'Action Planning group'.

## Instruments and measures

### *Quantitative survey*

In each of the 15 participating services, the lead consultant provided SP CERH with a list of all clinicians actively involved in the local miscarriage service. These clinicians included: obstetrician/gynaecologists (consultants, specialist registrars, staff grades and associate specialists, and senior house officers); midwives and nurses; and ultrasonographers. In total, 569 relevant clinicians were identified.

A questionnaire was developed to measure psychological constructs from the Theory of Planned Behaviour. Questions were derived from previously recommended scales (Ajzen, 1991; Conner & Sparks.P., 1996) and from a similar survey conducted by our own group in relation to abortion care. (Foy et al., 2005) The questionnaire focused on two key clinical audit criteria: (1) a *dedicated, early pregnancy assessment service should be available daily (including Saturday and Sunday)* and (2) *all women less than 25 years old presenting to early pregnancy services should be tested for Chlamydia trachomatis*. (These two criteria were pre-selected from the total of 35 audit criteria as being likely to have low baseline compliance and to include one criterion requiring action at the organisational level and one amenable to action by the individual clinician.) We sought data on the following constructs: *intention* (three items); *attitude* (four items); *subjective norm* (three items); and *perceived behavioural control* (five items) in the context of each of these two criteria. (Illustrative items from the questionnaire are shown in Table 2.) Each questionnaire item provided a measure of the relevant psychological construct on a 7-point scale; the mean score for all items relating to each construct was calculated to yield an overall score (from 1 to 7) for that construct. The questionnaire was piloted in an obstetric & gynaecology service which did not participate in the national audit.

In December 2002 (prior to feedback), all 569 clinicians were sent the postal, self-complete questionnaire. In July 2003 (after completion of feedback), clinicians were re-surveyed using a similar questionnaire. On both occasions, up to two reminders were sent to non-responders. Response rates were 381/569 (67%) for the pre-feedback survey; and 274/569 (48%) for the post-feedback survey.

### *Qualitative interviews*

In August 2003, an independent social scientist (SM) undertook in-depth, face-to-face interviews with clinicians exposed to the novel feedback interventions. The aim of the interviews was to elicit clinicians'

views on participation in the national audit and, more specifically, their perceptions of the style of feedback received. Because of resource constraints, in-depth interviews were restricted to 17 clinicians. These comprised seven clinicians (four obstetricians and three midwives) from three services in the *Letter* group and 10 clinicians (five obstetricians and five midwives) representing all five services in the *Action Planning* group. Interviews included a series of prompts to ensure that participants' perceptions of the audit in general and of each element of feedback were explored.

Interviews were tape-recorded and transcribed. Analysis of the transcripts was undertaken by two investigators independently (MC and GP). Content analysis followed a five-stage framework (Pope, Ziebland, & Mays, 2005) involving: familiarisation with the data by reading and re-reading the transcripts; identification of themes within the transcripts; indexing and charting the transcripts to ensure that all individual themes had been identified; and finally interpretation. Any differences between the investigators in themes identified and in interpretation were resolved by discussion without the need to involve a third researcher for arbitration. Quotations included in this paper are illustrative of the issues raised, but not an exhaustive representation of the interviews.

### *Statistical methods*

Internal reliability of the questionnaire items was assessed by calculating Cronbach's alpha for the items relating to each psychological construct (*intention, attitude, subjective norm, and perceived behavioural control*) for both key audit criteria (*7 day service* and *Chlamydia testing*) in both the pre- and post-feedback questionnaires. In general, internal consistency of the questionnaire items was good (Cronbach's alpha >0.8, see Table 3).

Means and standard deviations are presented for the scores for each construct pre- and post-feedback (both overall [Table 3] and by intervention group [Table 4]). To explore changes from pre- to post-feedback within intervention groups, within-person changes for each of the constructs were tested for using paired t-tests; mean differences and 95% confidence intervals are presented, with all confidence intervals inflated using the design effect to account for clustering (Table 4).

For each audit criterion, the primary outcome measure was post-feedback intention to comply. This was modelled using linear regression in an ANCOVA framework to adjust for pre-feedback intention. Dummy variables were included to estimate the effects of the *Letter* and *Action Planning* compared to the *Control*

style of feedback. Confidence intervals and *P* values were estimated using Huber-White standard errors accounting for the clustered nature of the data (Table 5). All data were analysed using SPSS and STATA.

For analyses relating to pre- to post-intervention changes, only responses from individuals who answered at both time points were used; 253 paired, before-and-after responses were available (44% of the total sample). Not all responders answered all questions; thus analyses relating to *provision of a 7-day service* were based on 215 paired responses and analyses relating to *Chlamydia testing* were based on 207 paired responses.

## RESULTS

### Quantitative survey

Table 3 summarises the mean scores for the four psychological constructs for each of the two audit criteria both pre- and post-intervention. At both time points, mean scores for *intention*, *attitudes* and *subjective norm* were relatively high. However, *perceived behavioural control* was lower, particularly in relation to *provision of a 7 day service*. Simple, bivariate correlation analysis showed that (for both key audit criteria at both time points) all three explanatory variables (*attitudes*, *subjective norm*, and *perceived behavioural control*) were significantly associated with *intention* (and with each other).



### ***Differences between feedback groups***

Comparing pre-intervention and post-intervention scores, Table 4 generally shows a small increase over time in the mean score for each psychological construct for each criterion. The main exception was *perceived behavioural control* in the context of *provision of a 7-day service* (responders consistently felt less able to offer a 7-day service after feedback). However, none of the changes over time in any of the psychological constructs (either overall or for individual feedback groups) reached statistical significance.

Regression modelling (ANCOVA) was used to explore the extent to which feedback group predicted post-feedback scores for each construct, while adjusting for pre-feedback scores (Table 5). There were no consistent relationships between feedback group and adjusted post-feedback scores. In particular, we were unable to demonstrate a significant positive effect of our novel approaches to feedback on intention to comply with either key audit criterion. The novel approaches to feedback appeared to have a negative effect

on *perceived behavioural control*, particularly in the context of *provision of a 7-day service* (where the negative effect of the Action Planning Letter was statistically significant ( $p=0.047$ )).

## **Qualitative interviews**

### ***Overall impressions of participation in the audit***

The first parts of all 17 interviews explored clinicians' general perceptions of participating in the national audit of miscarriage care (Table 6). All but three participants reported generally positive perceptions. The others described a mixture of positive and negative feelings. Specific themes that emerged as contributing to the positive aspects of participation included having an 'external' or 'official' assessment of the service; providing 'leverage' or 'ammunition' in making a case to management for additional resources; and a confidence-boosting effect. Even among staff with generally positive views, negative themes emerged: the time-consuming nature of audit was described by several participants; and some questioned the validity and provenance of the audit standards. In contrast with those describing a boosting of confidence, a few participants felt they had been demoralised, and that the feedback had not given due credit. A recurring theme, regardless of the style of feedback received, was a sense of frustration and lack of capacity to implement desired changes. Despite expressing some negative perceptions, interviewees were universally supportive of future audits of a similar style.

### ***Perceptions of the printed audit report***

All 17 participants described their impressions of the printed audit report (Table 7). The report presented anonymised results for individual services thus enabling clinicians to compare their performance with that of their peer-group services throughout Scotland. All participants expressed generally positive views on the content and style of the report and several specifically commented on the value of comparing performance with others. One participant specifically commended the fact that services were anonymised. Only one participant found the comparisons unhelpful, saying she was '*not bothered*' with comparing local performance with other centres. Despite overall positive perceptions of the audit report, some participants expressed reservations about the accuracy and validity of some findings.

### ***Perceptions of the Action Planning Letter***

Seven interviewees had received an individualised letter which highlighted the strengths and weaknesses of their own service and made suggestions for aspects which might require change (Table 8).

Five participants indicated that they found the letter 'useful' or 'helpful' and that it complemented the printed report. However, two participants had not used or discussed the letter. Even though they found the letter 'useful' or 'interesting', most participants indicated that it contained 'no surprises'; it confirmed their own perceptions of the strengths and weaknesses of their service. Only a few indicated that the letter highlighted areas for change that they had not previously discussed locally. The interviewer explored whether participants felt it was appropriate for the SP CERH team to make suggestions for changes in their service; or whether there was any sense of resentment about these external suggestions. All participants who had received and discussed the letter were comfortable with SP CERH having made suggestions, and with the suggestions they made. Letter recipients were asked if they felt they would have gained added value from face-to-face feedback from members of the SP CERH team. Universally, participants felt that this would not have represented a good use of time.

### ***Perceptions of Facilitated Action Planning***

10 interviewees had participated in face-to-face Facilitated Action Planning. They described their perceptions of both the preliminary Academic Detailing meeting and the subsequent Action Planning meeting (Table 9). Participants universally perceived that both meetings had been a good use of their time and were fairly evenly divided in feeling that there had been enough time for discussion or that things had been too rushed. Most participants were supportive of agreeing three target areas for change and were generally supportive of the two-stage approach to feedback and action planning. One clinician who had not had the opportunity to attend the Academic Detailing meeting indicated that she felt somewhat unprepared for the larger Action Planning meeting.

A few participants commented that the 'right people' were not present at the meetings; that appropriate people had not been invited or were unable to attend. A few expressed fearful anticipation of the Academic Detailing meeting and one participant indicated that she felt inhibited about speaking out.

One participant went as far as to describe the Action Planning meeting as 'fun', though another expressed anxiety about the findings being aired in a large meeting. One participant expressed personal feelings of guilt about the audit results. Conversely, another described how the open presentation of audit findings prompted positive feedback from a senior colleague. Participants were asked for their views on the formal diagnostic analysis of barriers to change which was undertaken at the Action Planning meeting. Most expressed positive impressions of this exercise.

Both meetings were facilitated by a Clinical Research Fellow usually accompanied by either the SPCERH Director or a consultant colleague. The interviewer asked participants for their impressions of these facilitators and asked whether an administrator, or other non-medical facilitator, would have been equally effective and acceptable. Participants universally spoke highly of the SPCERH facilitators; many indicating that less senior staff from other disciplines would have been less effective. Nevertheless, two participants felt that facilitators from different disciplines would have had just as much to offer. Many participants expressed strongly positive views about the value of face-to-face visits from the audit team (in contrast to the views on face-to-face meetings expressed by participants in the Action Plan Letter group).

## **DISCUSSION**

The Cochrane Review on *Audit and feedback* (Jamtvedt *et al.*, 2003) identified low baseline compliance as the strongest predictor of effective clinical audit. The two audit criteria chosen as outcomes for this study both had very low baseline compliance (only two of 15 services provided a *7-day early pregnancy service*; and across the 15 services, only 20% of women aged <25 years were *tested for Chlamydia trachomatis* as part of their care). (Scottish Programme for Clinical Effectiveness in Reproductive Health, 2003) Thus, there was good potential for achieving change in professional behaviour.

The method of feedback received by our '*Control*' services (printed audit report) included one characteristic of 'high intensity' feedback as defined by Jamtvedt *et al* (Jamtvedt *et al.*, 2003) (patient-level information on compliance with a standard, incorporating peer comparisons). In all other respects, feedback received by '*Control*' services would be considered 'low intensity'. Our novel feedback interventions were based on approaches which had been well-received in previous national audits and on theoretical grounds. The aim was to increase the intensity of feedback without undue resource implications. The Action Planning Letter served to increase intensity by: targeting (1) an individual recipient (lead consultant), rather than a group and (2) coming from an authoritative source (SPCERH senior clinical team). The Facilitated Action Planning further increased intensity by incorporating verbal format as well as written and by increasing the frequency of feedback activity.

In this study, we assessed the impact on target clinicians of the feedback interventions by measuring reported *intention* and other psychological constructs, rather than measuring actual clinical practice. The lack of before-and-after measures of actual practice is acknowledged as a limitation. Nevertheless, we believe that our measures of constructs from the Theory of Planned Behaviour, coupled with qualitative interview material, are helpful both in quantifying the effect of interventions and in explaining why interventions had such limited impact. Our study was intended to be exploratory in nature and to provide pointers to styles of feedback which warrant further investigation.

Our results provide reassurance that audit and feedback is an approach to clinical quality improvement that generally increases measures of psychological constructs which are known to be associated with behaviour change. However, in our study, measurable changes over time were small and not statistically significant. Moreover, we were unable to demonstrate that novel approaches (designed to increase the intensity of feedback) consistently produced greater changes in *intention* or other constructs.

Paradoxically, in the context of *provision of a 7-day service*, *perceived behavioural control* was lower post-feedback than at baseline. This paradoxical effect was greater in the intervention groups than in controls. This effect may have occurred because detailed consideration and discussion of the audit findings raised clinicians' awareness of the extent of barriers to provision of a daily service. Their perceived ability to bring about such a change may have been (reasonably and realistically) reduced by the action planning process.

Qualitative data from the in-depth interviews reinforced the findings from the survey. Clinicians expressed strongly positive perceptions of participation in a clinically-led, national audit project. Both novel approaches to feedback were well-received. Despite very positive perceptions of the overall audit and feedback exercise, many participants expressed frustrations at their inability to bring about desired changes because of managerial and systems-based barriers. These frustrations mirror those reported in a previous interview study undertaken in the early 1990's, at the beginning of the UK medical audit initiative. (Black & Thompson, 1993)

As in our previous work with Scottish obstetric and gynaecology clinicians, (Foy et al., 2005) we found that highly motivated individuals were constrained by organisational factors. Clinicians' attitudes and intentions towards nationally recommended clinical behaviours are strong. Interventions aiming to improve

performance by increasing intention alone may prove counter-productive, as highly committed clinicians may be demoralised and demotivated. Interventions with a wider target, encompassing health care managers, and directed at barriers at the organisational end of the spectrum are worthy of evaluation.

This exploratory study has shown that interventions designed to increase the intensity of audit feedback are highly acceptable to maternity professionals in Scotland. Moreover, we were able to recruit obstetric & gynaecology services to a study with a cluster randomised trial design. However, the feedback interventions we tested appeared to be no more effective in changing *intention* (or other psychological constructs) than simple distribution of a printed report. Indeed, more intensive feedback may even have a negative impact by increasing awareness of organisational barriers to change (as demonstrated by the significant reduction in perceived behavioural control seen after feedback in the 'Letter group'). Further work is required to identify how best to use audit and feedback as an effective tool for change.

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Table 1: Characteristics of audit and feedback associated with higher 'intensity'. (Adapted from Jamtvedt *et al*, 2003)

<b>Characteristic</b>	<b>High intensity</b>	<b>Low intensity</b>
Recipient	Individual	Group
Format	Includes verbal feedback	Written feedback only
Source	Senior colleague	Professional standards review organisation
Frequency	Weekly or more often	Less than monthly
Duration	One year or more	Less than one month
Content	Patient-level information on compliance with a standard or guideline. Incorporating peer comparisons	Information on costs or numbers of tests or prescriptions

**Table 2:** Illustrative items from *Theory of Planned Behaviour* questionnaire for maternity professionals

The following questions refer to this statement:

**All O&G services should provide an Early Pregnancy Assessment Unit (EPAU) that is open on a daily basis, and includes either a full or limited service on Saturdays and Sundays**

In the following questions, we are calling this a '7 day EPAU'.

**ATTITUDES**

**Overall, I think that offering a 7 day EPAU would be**

Bad Practice	1	2	3	4	5	6	7	Good practice
Harmful	1	2	3	4	5	6	7	Beneficial
A waste of time	1	2	3	4	5	6	7	A good use of time
The wrong thing to do	1	2	3	4	5	6	7	The right thing to do

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The following questions refer to *Chlamydia trachomatis* testing within the context of the following scenario:

**Next week, a 24 year old woman is referred to your clinical team and a diagnosis of complete miscarriage is made**

**INTENTIONS**

**I want to offer this woman *Chlamydia trachomatis* testing**

Definitely do not	1	2	3	4	5	6	7	Definitely do
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**I intend to offer this woman *Chlamydia trachomatis* testing**

Definitely do not	1	2	3	4	5	6	7	Definitely do
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**I plan to offer this woman *Chlamydia trachomatis* testing**

Definitely do not	1	2	3	4	5	6	7	Definitely do
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**Table 3:** Scores for each of four psychological constructs in the context of each of two audit criteria before and after feedback of audit findings

Audit criterion and time point	Theory of Planned Behaviour Construct	Cronbach's			Correlation between construct and intention*
		Alpha	Mean	(SD)	
Chlamydia testing Pre-feedback	Intention	0.96	5.3	(1.7)	
	Attitudes	0.92	5.8	(1.4)	0.74
	Subjective norm	0.86	5.0	(1.4)	0.77
	Perceived behavioural control	0.87	5.0	(1.6)	0.31
Chlamydia testing Post-feedback	Intention	0.95	5.5	(1.7)	
	Attitudes	0.93	5.8	(1.4)	0.78
	Subjective norm	0.84	5.2	(1.4)	0.75
	Perceived behavioural control	0.84	5.0	(1.1)	0.38
7 day service Pre-feedback	Intention	0.91	5.3	(1.8)	
	Attitudes	0.86	6.0	(1.3)	0.46
	Subjective norm	0.79	5.6	(1.2)	0.60
	Perceived behavioural control	0.79	3.5	(1.5)	0.52
7 day service Post-feedback	Intention	0.92	5.3	(1.7)	
	Attitudes	0.86	6.2	(1.1)	0.63
	Subjective norm	0.75	5.7	(1.2)	0.68
	Perceived behavioural control	0.80	3.3	(1.5)	0.55

\*for all correlations  $p < 0.001$

**Table 4:** Summary of mean differences (pre- to post-feedback) in scores for Theory of Planned Behaviour constructs (overall and by feedback group)

Audit criterion / construct	Feedback group	Pre-feedback		Post-feedback		Difference pre- to post-feedback		
		mean	SD	mean	SD	difference	95% CI	p
<b>Chlamydia testing</b>								
Attitude	Control	6.08	(1.20)	5.85	(1.41)	-0.23	(-0.80 , 0.33)	0.419
	Letter	5.35	(1.56)	5.51	(1.58)	0.16	(-0.54 , 0.87)	0.649
	Action Planning	5.78	(1.39)	5.94	(1.24)	0.16	(-0.28 , 0.60)	0.477
	overall	5.76	(1.41)	5.78	(1.41)	0.03	(-0.34 , 0.38)	0.894
Subjective Norm	Control	5.21	(1.36)	5.18	(1.45)	-0.03	(-0.69 , 0.64)	0.935
	Letter	4.49	(1.50)	4.60	(1.47)	0.11	(-0.80 , 1.02)	0.815
	Action Planning	5.22	(1.35)	5.57	(1.19)	0.36	(-0.33 , 1.04)	0.313
	overall	5.00	(1.43)	5.15	(1.42)	0.15	(-0.19 , 0.49)	0.386
Perceived Behavioural Control	Control	4.88	(1.63)	5.03	(1.24)	0.15	(-0.44 , 0.74)	0.618
	Letter	4.74	(1.62)	4.80	(0.94)	0.06	(-0.62 , 0.73)	0.868
	Action Planning	5.21	(1.42)	5.20	(1.00)	-0.01	(-0.62 , 0.60)	0.976
	overall	4.96	(1.56)	5.02	(1.08)	0.06	(-0.26 , 0.39)	0.692
Intention	Control	5.64	(1.46)	5.60	(1.64)	-0.04	(-0.59 , 0.50)	0.869
	Letter	4.66	(1.96)	4.93	(2.08)	0.27	(-0.45 , 1.00)	0.461
	Action Planning	5.55	(1.54)	5.93	(1.33)	0.38	(-0.12 , 0.89)	0.135
	overall	5.32	(1.70)	5.52	(1.73)	0.20	(-0.23 , 0.63)	0.356
<b>7 day service</b>								
Attitude	Control	6.53	(0.95)	6.53	(0.87)	0.00	(-0.46 , 0.46)	0.987
	Letter	5.77	(1.29)	5.89	(1.38)	0.12	(-0.64 , 0.89)	0.765
	Action Planning	5.77	(1.37)	6.19	(0.93)	0.43	(-0.15 , 1.00)	0.148
	overall	6.01	(1.27)	6.21	(1.09)	0.20	(-0.15 , 0.55)	0.257
Subjective Norm	Control	6.02	(1.09)	5.90	(1.31)	-0.12	(-0.72 , 0.48)	0.703
	Letter	5.19	(1.37)	5.34	(1.20)	0.14	(-0.59 , 0.88)	0.702

	Action Planning	5.49	(1.11)	5.80	(1.01)	0.31	(-0.82, 0.39)	0.494
	overall	5.57	(1.22)	5.70	(1.19)	0.13	(-0.20, 0.46)	0.449
Perceived	Control	4.33	(1.72)	4.27	(1.85)	-0.07	(-0.63, 0.49)	0.810
Behavioural	Letter	2.98	(1.25)	2.74	(1.26)	-0.23	(-0.89, 0.43)	0.488
Control	Action Planning	3.27	(1.08)	3.06	(1.00)	-0.21	(-0.11, 0.73)	0.147
	overall	3.52	(1.46)	3.34	(1.52)	-0.17	(-0.53, 0.18)	0.336
Intention	Control	5.98	(1.60)	5.54	(1.91)	-0.44	(-1.22, 0.34)	0.269
	Letter	4.65	(1.85)	4.97	(1.80)	0.32	(-0.67, 1.30)	0.531
	Action Planning	5.24	(1.64)	5.29	(1.42)	0.05	(-0.67, 0.77)	0.890
	overall	5.30	(1.76)	5.27	(1.71)	-0.03	(-0.50, 0.45)	0.919

**Chlamydia testing: control = 72; Letter = 61; Action Planning = 74 paired responses**

**7 day service: control = 67; Letter = 63; Action Planning = 85 paired responses**

**Table 5:** Differences between groups in mean post-feedback scores for Theory of Planned Behaviour constructs (results from ANCOVA with all post-feedback scores adjusted for pre-feedback scores)

<b>Audit criterion /</b>				
<b>construct</b>	<b>Feedback group</b>	<b>Effect size</b>	<b>95% CI</b>	<b>p</b>
<b>Chlamydia testing</b>				
Attitude	Letter	-0.09	(-0.60 , 0.41)	0.706
	Action Planning	.19	(-0.12 , 0.50)	0.212
Subjective Norm	Letter	-0.30	(-0.79 , 0.19)	0.216
	Action Planning	0.39	(-0.04 , 0.82)	0.072
Perceived Behavioural Control	Letter	-0.19	(-0.72 , 0.34)	0.463
	Action Planning	0.08	(-0.35 , 0.50)	0.201
<b>7 day service</b>				
Attitude	Letter	-0.40	(-0.75 , 0.06)	0.025
	Action Planning	-0.13	(-0.47 , 0.22)	0.446
Subjective Norm	Letter	-0.21	(-0.68 , 0.27)	0.367
	Action Planning	0.14	(-0.33 , 0.61)	0.530
Perceived Behavioural Control	Letter	-0.81	(-1.60 , -0.01)	0.047
	Action Planning	-0.64	(-1.44 , 0.17)	0.116
Intention	Letter	0.01	(-0.76 , 0.77)	0.998
	Action Planning	0.06	(-0.77 , 0.88)	0.884

**Table 6: Overall impressions of participation in a national audit of miscarriage care**

Positive perceptions

*'definitely a positive experience because it made us think a lot more about what we were doing'*

*'it was a well done audit'*

Mixed feelings

*'positive, improving our service; negative, reducing morale.'*

*'positive, a good learning process; negative, the volume of work. The data collection forms were more extensive than I anticipated.'*

*'I have a general dislike of audits'*

*'Interesting, rather than positive or negative. I didn't really feel it was greatly beneficial for here.'*

Something official

*'Very good to have something official to highlight a neglected part of the midwifery service.'*

Leverage for management

*'You can take it to your Chief Executive and say "look, we could be the best in Scotland if we do these three things.'"*

Boosted confidence

*'It has given us some confidence; we know what we are doing well.'*

Supportive of future similar exercises

*'Yes, but not too often.'*

Demoralising

*'Some of the nurses have got quite upset.'*

Time-consuming

*'If all these people who did all these reports did the same thing, you would never see any patients at all. That's one of the problems I have with the assessment and audit and so on.'*

Validity of audit standards

*'The audit standards are set down by guidelines, and you don't always agree with the guidelines. That's the main thing I have against it really'*

Lack of capacity to implement change

*'outwith our hands and our jurisdiction'*

*'The biggest change as a result of the audit has been our documentation. ...Which I felt was in our hands and you could do.'*

*'I just feel a bit overwhelmed....it would have been fine if we had shared or delegated the workload a little bit more'*

*'the trouble is, I can't remember what the action plan in my part actually was.....things have gone substantially backwards because of the building work going on'*

**Table 7: Impressions of a printed audit report which permitted anonymised comparisons with peer-group services**

Content and style

*'Very useful'*

*'Well laid out, it scores 100% marks'*

Inter-hospital comparisons

*'At least you can benchmark yourself against the other units'*

*'I liked the fact that the areas weren't identified, that it was anonymous'*

Accuracy and validity of findings

*'that data you've got on our anti-D administration is wrong'*

**Table 8: Perceptions of a service-specific Action Planning Letter**

Usefulness

*'I liked the letter more than the report because that specifically told us about our services.'*

*'I can't tell you that I definitely read that letter.'*

No surprises

*'I knew that that was what our shortcomings were'*

Highlighted issues not considered previously

*'The letter highlighted an issue (7 day service) that hadn't been discussed internally previously – and has prompted action.'*

Appropriate for SPCERH to suggest areas for change

*'I thought it was quite appropriate. Initially, I thought they had just plucked three items.....So, obviously thought had gone into it and I felt that it was quite handy to have.'*

Face to face feedback would have little added value

*'Issues brought up are pretty straightforward; it would have been a waste of their time to discuss.'*

**Table 9: Perceptions of face-to-face Facilitated Action Planning**

Time allocated for discussion

*'ample time to discuss everything'*

*'quite a tight time schedule, it would have been nicer to have some more time'*

Agreeing three areas for change

*'You can't do everything at once. Focus people on a few. That is fine by me.'*

*'Not appropriate at all (to select three areas); we had five different weaknesses; we are acting on these as well.'*

Relevant people not present

*'The first meeting was just me I think. The sister couldn't come because she was too busy.'*

*'(clinical director) wasn't there and I especially asked him, and I spoke to (consultant midwife), she wasn't there either. It's difficult to get hold of all the managerial types.'*

Fear and trepidation

*'It provoked a certain degree of anxiety; kind of going to school for a report.'*

*'I had a little bit of anxiety of how my colleagues would interpret some of the findings'*

*'Medical staff were asking "Why, why are you not doing these things?" I felt almost guilty about it.'*

Inhibited to speak

*'This hospital is very political and some of the things you want to say, you can't always say.'*

Fun

*'It is more fun at a meeting than reading it.'*

Positive responses from senior colleagues

*'Even the Director, she came to me and she said "There is a lot of good work going on along there, M." So, they were aware we are doing things.'*

Perceptions of the diagnostic analysis and action plan

*'Very good actually. I did take it all down because I thought if I am ever doing anything like this again....'*

*'Very useful, it actually nailed down the things that we needed to do within the time frame.'*

*'Well, it seemed useful at the time'*

Value of senior, medically-qualified facilitators

*'I don't think it would be as useful. I think they actually need to understand everything including the politics to the patient care'*

*'I am sure everybody would have some use, whether it was a medical person or not.'*

General support for two-stage action planning

*'If you repeat the message often enough, it gets through'*

*'it was an advantage, so you can prepare yourself more.'*

*'I went in a wee bit cold actually'*

*'head to head discussions better than just sending a report. Most of them just get bunged in the bottom drawer'*