

**SCSRN**

SMOKING CESSATION SERVICE RESEARCH NETWORK

**A report for the Department of Health**

# NHS Stop Smoking Service CO-verification project

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## 1.0 Executive summary

- Expired air carbon monoxide (CO) monitoring of clients attending NHS Stop Smoking Services (SSS) is important for motivational and verification purposes.
- The Department of Health requires that SSS attempt to CO-verify at least 85% of all clients who self-report as abstinent at four weeks; SSS vary in achieving this target but overall levels of verification are lower than is desirable or required.
- This project aimed to investigate current CO-verification practices amongst a selection (n=11) of SSS by interviewing service managers; and to develop guidance on best practice.
- Differences in CO-verification rates between SSS appeared to be mainly due to different interpretations of what was required on the monitoring form (i.e. it was an artefact of the question). Some services incorrectly defined an attempt at CO-verification as an occasion where a client was handed a CO monitor.
- CO-verification was more likely to be achieved by specialist core staff than by intermediate advisors. This reflected uncertainty amongst SSS managers as to the practices of their intermediate advisors.
- All of the SSS managers interviewed said that they gave CO monitoring a high priority; however none of the services had a policy that specifically addressed CO monitoring and its importance was not always reflected in clinical documentation.
- Access to CO monitors appears to be adequate (one per specialist advisor, one per venue for intermediate advisors), but the level of maintenance and calibration is sub-optimal.
- Training of advisors and clinical documentation should reflect the different functions of CO monitoring and the importance of CO-verification at four weeks post quit.
- Local SSS and regional-level systems need to be developed to monitor compliance with the requirement that attempts should be made to contact 85% of self-reported quitters for CO-verification.
- Clarification of the definition of attempting CO-verification should be disseminated and the importance of actually obtaining CO-verification should be emphasised.

## 2.0 Introduction

Carbon monoxide (CO) is a gas inhaled by smokers from cigarettes; it affects the cardiovascular system,<sup>1</sup> is linked to heart disease<sup>2</sup> and has adverse effects in pregnancy.<sup>3</sup> Hence, measuring levels of CO in smokers is a simple way of objectively showing the immediate damaging effects of smoking upon their health. CO has a short half-life, with elimination becoming slower as the concentration decreases,<sup>4</sup> and it is eliminated from the body within around 24 hours of stopping smoking.<sup>5</sup> This characteristic makes the measurement of CO useful for verification, if a smoker reports not smoking in the preceding 24 hours an exhaled air test can confirm this, and for purposes of motivation<sup>6</sup>. CO is easy to measure using readily available commercial products like those supplied by Bedfont Scientific Ltd<sup>7</sup> and Micro Medical Ltd.<sup>8</sup> These devices give a CO reading in parts per million (ppm) and 9ppm is generally considered to be the highest acceptable level of CO in the exhaled breath of an individual who reports not smoking<sup>9</sup>.

Clients of NHS Stop Smoking Services (SSS) who smoke after the quit date may be motivated to incorrectly report abstinence for a number of reasons. For example, a continued supply of medication may require clients to be abstinent, clients may wish to continue attending the service but be fearful of being excluded or clients may simply be embarrassed by their lack of success. The scale of such misreporting is unclear, although it has been estimated that over 10% of smokers misreport in general surveys in the UK<sup>10</sup>. Whatever the extent of the phenomena it is clear that verified abstinence rates are desirable for accurate monitoring of services and for good quality research.

Smoking cessation advisors are required to use CO monitoring to verify clients' self-reported abstinence four weeks after the quit date. However, this may not occur when clients are contacted by telephone because they are unable or unwilling to attend a face-to-face appointment for purposes of verification. Current monitoring guidance requires that SSS should attempt to verify self-reports of abstinence in 85% of cases.<sup>11</sup> The guidance states (page 15) that "an 'attempt' to carry out CO verification should comprise a minimum of three separate attempts to contact the client via telephone, text or e-mail in order to arrange a face to face CO validation".

During the 12 months between April 2006 and March 2007 the mean self-reported four week post-quit abstinence rate<sup>9</sup> in England was 53%, while the CO-verified abstinence rate was 33%<sup>12</sup>. The large discrepancy must, almost wholly, be the result of an absence of verification rather than the failure of CO monitoring to confirm self-reported abstinence. In fact, in 2006–7 CO-verification was attempted on an average of 72% of SSS clients reporting abstinence at four weeks post-quit. In a sample of six client databases obtained by the Smoking Cessation Service Research Network (SCSRN; [www.scsrn.org](http://www.scsrn.org)) attempts at verification varied from 65% to 93% of clients who reported abstinence four weeks after their quit date, indicating that higher levels of verification can be achieved. Clearly the overall levels of verification are lower than is desirable or required<sup>13</sup> and there is considerable variation among the services.

This project set out to examine the methods used for CO-verification by *high performing* services, and also the barriers to CO-verification reported by services that perform less well in this regard, and to develop guidance for best practice for CO monitoring.

## 3.0 Aims

To establish best practice for CO-verification and to develop guidance for SSS on how to maximise their levels of verification.

### 3.1 Objectives

1. To identify, from Department of Health records, five English Stop Smoking Services who report the highest levels of CO-verification and another five SSS whose levels of verification are the lowest
2. To design a semi-structured interview applicable to both groups
3. To contact managers of the services identified and conduct the semi-structured interview
4. To uncover any themes and trends that distinguish the successful from the under performing services
5. To determine which factors, if any, determine performance level for CO-verification including: techniques of establishing client contact, strategies for obtaining face-to-face appointments, level of commitment from the service manager and barriers to verification
6. To generate a report of findings, with recommendations for best practice, from the results

## 4.0 Methods

The first stage of this project involved obtaining the contact details of the five top and bottom performing SSS in England. For the purposes of this project, performance was defined and measured solely in terms of levels of attempted CO-verification. However, for the period in question (the final quarter of 2007/8) the Department of Health (DH) only collected information on CO-verification in NHS Stop Smoking Services at a Strategic Health Authority level, not at a service level. Hence the DH provided the researcher with the contact details for the two top and bottom performing Strategic Health Authorities (SHA) in England. The researcher requested that the four SHA's identified the highest and lowest performing three services within their region. The top three performers in the two best performing SHA's, and the bottom three performers in the two bottom performing SHA's, were then selected. The managers of these twelve services were contacted over a period of six weeks (August - September 2008) and a semi-structured interview was carried out by telephone. All telephone conversations were recorded on a PHONAPART telephone two-way recorder and the interviews were transcribed and collated; the recordings were then destroyed. E-mail correspondence followed where data was not readily available or where the service manager had agreed to send documents describing their policy for CO-verification. As this was an exploratory study the interviews mostly comprised of open-ended questions. There was plenty of scope for free comment, and the analysis was of themes and trends in the managers' reports of activities. The content was analysed to explore attitudes to CO monitoring generally, barriers to CO-verification and the methods and systems used to achieve CO-verification in the services.

NB: In this report the term 'intermediate advisor' is used to denote 'level 2 advisor' or 'community advisor'



## 5.0 Findings

A total of 11 service managers were successfully interviewed (five managers in the *high performing* group and six managers of in the *low performing* group).

Seven service managers provided DH returns figures for abstinence (four *high performers* and three *low performers*). These figures were converted to percentages and are given below. Service Code: HA-HE are *high performing* services, LA-LF are *low performing* services.

**Table 1: Department of Health return figures for participating Stop Smoking Services**

Service code:	% of treated smokers who quit at 4 weeks (self report)	% of treated smokers who were CO-verified quitters at 4 weeks	% of self reported quitters for whom CO-verification was attempted	% of self reported abstainers verified by CO
HA	49	38	100	78
HB	43.8	36.5	84	83.4
HC	56.5	43.5	100	77
HD	65.2	57	100	87.4
HE			88.6*	
<b>Mean value</b>	53.6	43.8	94.5	81.5
LA	76	16.4	21.5	21.5
LB	52.4	6.4	12.2	12.2
LC	60.5	22.1	36.5	36.5
LD			14.7*	
LE			13*	
LF			34*	
<b>Mean value</b>	63	14.9	30.0	23.4

\* Where complete figures were not provided by the SSS manager, levels of attempted CO-verification from their region were used

It can be seen from this table that self reported success rates varied between the services, and that CO-verified quit rates varied by an even greater degree. This is due to differences in the levels of CO-verification achieved between the two groups and is related to the variation in the percentage of self reported quitters where CO-verification was attempted (the selection variable in this project).

Looking at the data provided by region (not reported here) there was also a suggestion that attempted verification rates varied between regions. In one SHA the highest and lowest scorers within the region were all relatively low (i.e. from 6% to 58%, mean=32%) and in two they were all relatively high (e.g. from 49% to 100%, mean=75%); the fourth SHA had a broader range (21%-100%, mean=61%).

## 5.1 Managers interpretation of the term 'attempted'

The DH SSS returns contain a column with the heading: 'number who had successfully quit at four week follow-up (self report) where confirmation of non-smoking status by CO validation was attempted'. This was the selection variable for the study and so it was crucial to understand what figure managers entered into this section of their returns. Hence, managers were asked (at the end of the interview) how they interpreted this item.

It appeared that the interpretation of this item was one major cause of the difference in the percentages reported. Those who scored well in this regard had included all occasions where attempts were made to contact the client to invite them in for verification. An attempt was typically defined as 'three separate attempts to contact them' as in the monitoring guidance (page 15). Where a lower figure was reported, managers had interpreted an attempt at CO-verification as an occasion where the CO monitor was placed in the clients hand and a CO was attempted.

**HD:** "...attempted means endeavoured to carry it out / have made it available to them"

**HA:** "That means that we've attempted to get them in for CO-validation"

**LD:** "My interpretation would be physically giving the person the monitor"

**LC:** "We don't put it in if attempted only, only if CO-verification was achieved"

This is reflected in the fact that the figures for 'attempts to CO-verify' and 'successful CO-verifications' are the same among the three *low performers* for whom we have figures, while there is a difference between these two figures among the *high performers* (see Table 1). Table 1 also reveals an apparent correlation between 'attempts at verification' and actual percentage of self-reported quitters who were verified. This would suggest that *high performing* services are managing to follow-up a greater percentage of their self reported quitters, as well as 'attempting' to follow more of them up.



Four of the six managers of *low performing* services interviewed stressed that they were now aware of the monitoring guidance definition of 'attempted' (i.e. that it is three attempts to contact the smoker) and that they have amended their data collection to reflect this. These services anticipate that this change in their recording practices will be reflected in their DH returns in the future.

Problems with capturing the data was also given as a reason for low figures:

LA: "Gold standard monitoring form doesn't offer a box to say whether CO-validation has been attempted, only if it has been confirmed"

LD: "The figure given is more a case of the fact that our database didn't have the ability to capture that data"

Two of the *low performing* services interviewed also reported collecting data directly from GP records:

LE: "A large number of our quitters came direct from GP records, without the full monitoring form being completed"

It is interesting to note that two of the *low performing* services opted to send the researchers a copy of their First Quarter returns for 2008/9. In one of these cases (LD) the level of attempted CO-verification had increased from 14.7% to 100%, however their CO-verified quit rate was still low at 15.9%. This indicates that they have simply changed their definition of 'attempted' and not their practice of attempting to contact clients to verify self-reported abstinence. In the other case (LB), the percentage of self-reported quitters who were CO-verified rose from 12.2% to 72.5%. This is a huge improvement and when asked about the improvement, the manager commented that:

"The reason the CO results increased was due to writing to advisors explaining the importance of this and phoning up advisors who had not entered the relevant details on the monitoring forms"

This indicates large improvements can be made relatively simply by stressing the importance of CO monitoring at four weeks post-quit.

## 5.2 Managers attitudes to CO monitoring

All managers reported that the taking of CO readings was ‘very important’ or ‘extremely important’ with no difference between *low and high performers*. When asked what the main reason for CO monitoring was, most managers reported that it was important for assessment and motivation as well as for verification of self reports. LE’s response was typical:

“The main reason depends on what hat I’m wearing. Service manager – then verification, clinician – then motivating”

Service managers appeared to place very similar levels of importance on CO monitoring and give comparable reasons for doing so; however, there were clearly differences between services in their understanding of the meaning of the term ‘attempted’ as discussed previously. This suggests that meaningful comparisons between the CO monitoring practices of low and high performing services would be difficult; hence the decision was taken to examine responses of the services as a whole in order to derive indications for best practice. The remainder of the results are presented with that in mind and in item order.

### 5.3 Does your service have a written policy on CO monitoring?

None of the services had a policy specifically covering CO monitoring, although two of the *high performing* services had written policies on infection control for CO monitoring. However, most reported including CO monitoring in training or in another policy documents (e.g. their Locally Enhanced Service agreement (LES) or 'quality principles').

**LD:** "It's in local service agreement standard, it says should monitor at least at initial visit and at four weeks. But as a practice rule I would advise all my advisors that I would expect them to be doing it at each visit. There is the minimum data set then there is best practice"

Seven of the 11 services emailed the relevant documents after the interview from which the sections below are taken. Most, but not all, of the documents specifically mentioned the importance of follow-up at week four with strong emphasis on CO-verification:

**LD:** Validate all successful quit attempts at four weeks after quitting using Carbon Monoxide (CO) verification and offer this test to all clients attending after quitting.

**HE:** "Item three of Quality Principles: 'There should be a strong emphasis on CO-verification of quit status at four weeks from the quit date. This should be attempted in at least 85% of cases'"

In the following case CO reading is stated as mandatory, but there is no instruction given regarding what to do if a client does not attend their four week post-quit appointment.

**LA:** document appendix, 1:1 support "Take CO reading (mandatory) - if reading less than 10, has successfully quit!"

Some documents mentioned that follow-up should be 'attempted' in 85% of cases but with the emphasis on attempting to make the follow-up, not necessarily on obtaining a CO reading. For example

**LF:** CO validation at four weeks from the patient's quit date must be attempted in at least 85% of cases. An 'attempt' to carry out CO verification should comprise a minimum of three separate attempts to contact the patient via telephone, text or e-mail in order to arrange a face to face CO validation

**HA:** 'phoning round procedure' document: 'The purpose of this contact is to determine their smoking status'

In the latter case there is no mention made in the document of asking the client to attend for CO-verification.

Not all of the documents sent strongly differentiated between CO readings taken routinely at every visit and the particular importance of CO readings at four weeks.

LC: “‘Take and discuss CO reading’ to be completed at visits 3–6”

Hence, while most of the documents instructed advisors to conduct follow-up at week four, including a CO reading, the emphasis that this was given varied. The emphasis in any documentation should be upon obtaining a CO reading at week four, with adequate attempts at follow-up being the means to that end.

It should be noted that these comments are based on the documents received and do not take into account the wider context (i.e. any other instructions or training offered by the services).

#### 5.4 Do you have any input on CO monitoring from the region?

Most managers did not report any specific input from their region on CO monitoring. However, two of the *low performers* reported regional input stressing the importance of improving their attempted verification level.

**LC:** “The direction this year is that they want us all to try and achieve the 85% attempted CO monitoring. Keen for to us to achieve that.”

**LD:** “Discussed with region and needs to take the guidance literally as ‘attempting’ to perform CO’s.”

## 5.5 What proportion of your clients are seen by specialists vs. intermediate advisors?

The structure of services across the UK obviously differ in this regard; however, it was interesting to note that the *high performing* services reported that more of their smokers were seen by their core service staff compared with *low performing* services (see table 2). On average, across the four *high performing* services in this sample approximately 58% of smokers were seen by specialists, whereas among the six *low performing* services the figure was 21%

**Table 2: Percentage of clients treated by specialist core staff**

Service Code	Approx. % treated by specialist core staff
HA	55
HB	33
HD	87
HC	57.5
<b>Mean</b>	58
LA	38
LB	10
LC	30
LD	10
LE	7.5
LF	32
<b>Mean</b>	21.3

## 5.6 In practice, at what visits do your advisors routinely obtain CO readings?

Managers seemed to be more confident about the level of CO monitoring among their specialist staff, than among intermediate advisors. Generally it was recommended at every visit, with an emphasis on weeks one and four post-quit.

**HC:** “Every visit for everyone, GP’s and pharmacy’s asked to but don’t know if they really do. Specialists definitely every visit, and definitely on the last intervention at four weeks.”

**LC:** “Usually at first meeting, definitely at four week follow-up, but very often at every visit. Specialist service: Usually every session. Intermediate advisors: Not always, but expect to see initial and four week follow up readings on the form.”

**HE:** “CO monitoring is an integral part of every appointment. All advisors are expected to be doing it at every contact. Not just four weeks.”



## 5.7 What proportion of clients who report not smoking four weeks from their quit date have their CO reading taken?

All managers reported higher levels of verification among their specialist service compared to their intermediates, although many were not able to provide accurate figures (see Table 3).

**Table 3: CO-verification by type of service staff**

Service Code	% with CO reading taken: whole service	% with CO reading taken: specialists	% with CO reading taken: intermediates
HA	76	83	68
HE	83	98.6	72.6
HB	86	99	80
HD			Approx. 65% of unverified reports came from this sector
LA	21.5	Approx. 90	
LC	36.5	82	25
LE		Approx. 80-90	Approx. 40-50

Note: some figures do not correspond well with figures given elsewhere by SSS managers

## 5.8 Do you ever monitor clients after their four week post-quit appointment?

Typically services offered CO monitoring for as long as the smoker was in contact with the service, which was often until the end of their medication period and sometimes beyond. Two of the high performing services offered awards to their smokers for passing CO tests at weeks four and 52 post-quit.

**LE:** “Specialists, yes determined by patient need, and CO offered every visit. LES contract just says they need to offer service for four weeks, so they may or may not go beyond that. I’d recommend that in training. It’s not recorded.”

## 5.9 What do you do to try to contact smokers for their four week follow-up and who is responsible for conducting four week follow-ups?

SSS managers reported that this typically involved seeing the patient at their usual appointment; however, if they did not attend then either the advisor themselves, a telephone advisor (in two cases) or an administrator would attempt to follow-up. Who conducted the follow-up varied between and within services; sometimes it was a team effort depending on who was available. There seemed to be less certainty regarding policy and practice for intermediate advisors.

Typically, follow-ups involved two or sometimes three telephone calls and then a letter. Most managers knew of the guidelines to attempt follow-up in 85% of self-reported quitters and in many cases this was written into documentation.

**HD:** “We have a Telephone advisor who supports over the telephone, this telephone advisor takes on follow-ups. End of four weeks they have a silver award certificate available only if self report is CO-verified. Standard protocol is two attempts by telephone (some out of hours, advisor will take the list home if we have people we know are not available in normal hours) then send out a letter with an attached slip. Advisors will also follow-up.”

Service managers were often not aware of what follow-up protocol was used among their intermediate advisors.

**HC:** “I can’t say for sure, don’t know. May follow their own protocol, but we train them to follow same protocol (i.e. three attempts) as us but they may not.”

**LC:** “Specialist service: advisors expected to follow-up. Intermediate advisors: most work in GP practices. Not sure who would do it, but it is probably usually the advisor in the practice who does it. It depends on practice protocol. Intermediates are encouraged to make three attempts, but it is whatever that practice feels they can do.”

**LE:** “Specialist service: advisor themselves. Intermediate advisors: pharmacy or GP staff, not written in LES so I don’t know how much they try to follow someone up. Don’t know what protocol is followed. Although in training we would recommend it.”

Some services faced specific practical problems:

**HD:** “They are not attending at week four because their NRT is arranged with GP from week three so people don’t go back. We are trying to address this, e.g. by getting follow-ups sent in to telephone advisor above.”

There was no evidence that follow-ups conducted face-to-face by advisors were more likely to produce positive outcomes than those conducted by telephone or by service administrators. However, it was apparent that service managers were not always aware of how follow-ups were conducted by their intermediate advisors, who was responsible for this or what procedure was followed in individual general practices.

## 5.10 What proportion of your advisors have their own CO monitor?

The majority of managers reported that all their specialists had their own CO monitor and that their intermediate advisors had at least one per venue. One was exceptional in this regard:

**HD:** “Specialist service; all have two so they can alternate between them and allow the first one they use to normalise between readings. Also so they have backup for failure.  
Intermediate advisors; all have their own, but just one each.”

One service (LF) required intermediate advisors to provide their own CO monitors, leading to additional problems at the maintenance/calibration stage (see overleaf). It is imperative that all advisors are provided with CO monitors (and sufficient mouthpieces) by the service for as long as they are actively seeing smokers. This is a practical issue but also indicative of the priority CO monitoring is given by the service.

### 5.11 How often are your CO monitors calibrated and how is this organised?

The procedure for calibrating CO monitors varied widely from service to service. Some services seemed highly organised and structured in their approach, other services were more ad hoc and one even reported that they did not offer a CO monitor calibration service.

**HA:** Specialists: every three months routinely. Intermediates: At quarterly update meetings monitor is calibrated. Have an attendance sheet with a check box for if monitor is brought in and calibrated. If advisor DNA two update meetings then specialist goes to them and will calibrate monitor. Some ad hoc if people call to say readings seem wrong.

**HD:** “On a travelling basis during 6 monthly visits to pharmacists. They can off load one and pick up another.”

**LB:** “We try to do it every 6 months, bring to advisor meeting every three months, also big conference once a year, do a lot there. By post takes a couple of days. Also specialists have area of GP’s they cover, they will go in and calibrate them there. Monitors have a sticker on them saying when next calibration is due.”

**LC:** “At least annually, more frequently if there is a problem. It’s the core service specialist advisors responsibility. They have a portfolio of intermediate advisors they look after and its their responsibility to make sure those monitors are checked.”

**LF:** “Should be 6 monthly, Specialists do it for intermediates, go out with equipment but not sure how often. No record of monitors as not all are owned.”

Again there was no strong evidence to suggest that one system was better than another. However, clearly it is important that responsibility is allocated and a procedure is in place for calibrating CO monitors and that it is given appropriate priority within services.

## 6.0 Discussion

Overall, service managers appeared to be committed to the idea of CO monitoring for both motivational and verification purposes. However, different interpretations of what constituted an attempt at CO-verification led to a wide variation in the figures given in DH returns for 'number who had successfully quit at 4 week follow-up (self report) where confirmation of non-smoking status by CO validation was attempted'. Some services interpreted "attempted" as was intended<sup>11</sup> (i.e. where three attempts to contact clients to CO-verify self-reported abstinence were made); other services defined an attempt at CO-verification as an occasion where a client blew into a CO monitor. Clearly this is an issue of education which would appear to be fairly easily addressed. It is also worth noting that one would expect a small percentage of clients who self-report as abstinent at four weeks to fail CO-verification; current data collection methods do not allow this information to be extracted.

There were also problems reported with capturing data on CO-verification; and some services are still conducting 'trawls' of GP databases to pick up smokers who have stopped smoking without accessing services. Obviously, in these cases, CO monitoring is not attempted and such practices not only undermine the reputation of SSS but devalue CO-verification attempts as a means for examining service delivery. Many *low performing* services reported having become recently aware of the correct interpretation of the monitoring guidance, definition of 'attempted'; consequently their DH return figures should show an improvement. In addition, among the four SHA's in the sample, there was also a suggestion that attempted verification rates may vary between regions. This could reflect a culture among service managers within that region or an effect emanating from the Regional Tobacco Control Leads.

Nevertheless, some services clearly achieved significantly higher levels of CO-verification at week four and hence better CO-verified quit rates, despite the fact that self reported quit rates did not vary significantly between the services sampled. The reasons for these differences could not be teased out from the documents received from the services or from the interviews given: there appeared to be little difference in policies or strategies used. It is perhaps likely that the differences are due to service structure, or to more subtle issues of the local emphasis and priority given to CO monitoring.

All managers reported lower levels of verification from their intermediate advisors, and with large numbers of smokers seeking help from this sector this is a significant issue. Indeed, in the services sampled this structural difference is the most likely explanation for the variation in CO-verified quit rates. Among *low performing* services 21% of clients, on average, were treated by core specialist staff compared with 58% for *high performing* services. It appeared as if some service managers were not aware of what protocols intermediate advisors were using to follow-up four week self-reported quitters. Service managers typically trained intermediate advisors to use the 'three attempts' model, but did not know if they were doing so. The managers seemed uncertain of the quality of their intermediate advisors work in this regard and this is clearly an area that requires attention.

The anecdotal evidence from one manager that they improved the verification levels in their service (by about six fold) simply by stressing the importance of CO monitoring, and by chasing up individual advisors who failed to provide this data, suggests there is merit in a strong lead from managers and a system for addressing non-compliance by advisors. At the most basic level it is essential to ensure that every advisor has their own CO monitor that is paid for, maintained and calibrated regularly by the SSS. Responsibility for this could be given to a specialist advisor or advisors who have a comprehensive list of monitors, their whereabouts and when they are due for calibration.

As there were no marked differences in policy documents, or views expressed in the interviews, between *high* and *low performing* services it was not possible to say which strategies work better for ensuring self report quitters are CO-verified. For example, there is no evidence to suggest that the client's advisor is more likely to be successful at obtaining CO-verification from them than a different advisor or even an administrator.

One issue of concern is that whilst there was an expressed emphasis on obtaining follow-up at four weeks; there was less emphasis on facilitating face-to-face meetings for the purposes of CO-verification. An additional general conclusion, drawn from the interviews with managers and from the documents relating to CO-verification reviewed by the researcher, was that there was not always a strong enough emphasis on the significance of CO readings at four weeks, compared with CO readings taken routinely at every visit. The different role CO monitoring plays at different stages of a quit attempt (i.e. assessment, motivation and verification) should be emphasized in advisor training, at update meetings and in the text of any documentation. In addition, incentives could be offered for CO-verification at four weeks to intermediate advisors (e.g. additional payments) and to clients (e.g. certificates). An issue not addressed in this project, but one which is crucial to successful CO monitoring, is whether advisors were instructing clients in the correct procedure for expired air CO testing. Clearly this should be covered in initial advisor training; and could be addressed during update training and via a written list of instructions.

Clearly this project is limited by the restricted sample of SSS and the absence of validation for the items raised in the semi-structured interview. Additionally, the documents submitted by the services were reviewed by a single researcher without the structure of an analysis framework. However, this project is the first of its kind to report in any detail on the CO-verification practices of SSS and raises some useful issues that need addressing.



## 7.0 Conclusion

Different definitions of what constitutes an attempt at CO-verification can account for much of the difference in rates of attempts between *high* and *low performing* SSS; but not for the differences in the percentage of clients that are actually verified. Levels of CO-verification appear to be lower among intermediate advisors and this appears to be a result of the importance given to CO-verification by SSS managers and the quality of systems employed by services to monitor this. Access for advisors to CO monitors that are regularly calibrated is also clearly an important practical consideration.

## 7.1 Recommendations

1. All advisors should have their own CO monitor, paid for by the SSS, that is properly maintained and calibrated. Systems should be in place to ensure that CO monitors are calibrated as per the manufacturer's instructions.
2. SSS training and documentation should stress the different uses of CO measurement at different time points, and emphasise the importance of it for verification at week four post-quit.
3. SSS should have a written protocol for CO monitoring. This protocol should emphasise the importance of obtaining CO-verification of self reports, with adequate follow-up being the means to that end.
4. Payment should only be made to intermediate advisors under an LES if a full monitoring form is completed and submitted to the SSS. Written in to this LES agreement should be the stipulation that follow-up at four weeks is to be conducted with all self reported quitters. If clients do not attend their appointment they should be followed up by telephone, text or email (three times at different times of day) and, importantly, asked to attend for CO-verification.
5. Consideration should be given to making funding available for home visits for the purpose of CO-verification.
6. Regional variations need to be addressed by ensuring that the Regional Tobacco Control Leads monitor the data on CO-verification from SSS within their region and attend to *low performing* services.
7. Consideration should be given to recording whether CO-verification has been attempted on the Gold standard monitoring form.
8. If the current definition of 'attempting' to obtain CO-verification is retained (i.e. three attempts to contact clients who self-report abstinence) then it should be stipulated that this should be attempted in 100% of cases. The Department of Health could provide useful clarification on the definition of attempting CO-verification.
9. The Department of Health could consider defining their primary outcome measure of the success of SSS as CO-verified abstinence rates at four weeks. Such a measure would strongly reinforce the importance of obtaining CO-verification of self-reported abstinence and would allow the Department to more accurately gauge SSS performance.

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## Authorship

The views and opinions expressed in this report are those of the authors and do not necessarily represent the position of the Department of Health.

## Dissemination

This report will be made available on the website of the Smoking Cessation Service Research Network (SCSRN) from 30th November 2008: [www.scsrn.org](http://www.scsrn.org)

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