Measurement of outcomes of smoking cessation services in New Zealand

A summary for Funders and Providers

Purpose of this document

The purpose of this document is to clarify the outcome measures to be used by smoking cessation services (‘Cessation Services’). It is intended for both funders and providers of Cessation Services.

Background

The New Zealand Ministry of Health (the Ministry) funds a number of different Cessation Services including the National Quitline, Aukati KaiPaipa and some services for pregnant women who smoke. More recently some DHBs and PHOs are also funding smoking cessation services (SCS).

The primary purpose of smoking cessation services are to help people who smoke to quit. SCS should routinely monitor smoking status of their Service users and outcomes of the service. There are however different ways of measuring smoking cessation outcomes and following a Ministry review of the funded SCS it became clear that a consistent outcome measure across all SCS was required to provide a true picture of effectiveness and cost efficiency.

In 2010 the Ministry produced the ‘Measurement of outcomes of smoking cessation treatments in New Zealand’ document, providing recommendations of a minimum standard of measuring smoking cessation outcome (see appendix 1). This was then sent to key stakeholders for comment and feedback.

What is the standard outcome measure?

The minimum standard asks for measurement of smoking status at two time-points. The first is at 4-weeks following the target quit date (TQD) and the second at 3-months after the TQD.

4-week outcome measure

At 4-weeks after their TQD Service users should answer the following question by choosing one of the four options.

Over the past 2 weeks have you smoked at all?

(a) No, not a single puff
(b) Yes, just a few puffs'
(c) Yes, between 1 and 5 cigarettes
(d) Yes, more than 5 cigarettes.

Only those who answer ‘(a) No, not a single puff’ will qualify as 4-week abstainers.

3-month outcome measure

At 3-months after their TQD service users should answer the following question by choosing one of the four options.

Over the past 4 weeks have you smoked at all?’
(a) No, not a single puff
(b) Yes, just a few puffs'
(c) Yes, between 1 and 5 cigarettes
(d) Yes, more than 5 cigarettes.

Only those who answer ‘(a) No, not a single puff’ will qualify as 3-month abstainers.

What is a Target Quit Date (TQD)?

The TQD is the date at which a Service user plans to stop smoking altogether with support from a cessation service.

Do service users have to set a TQD?

Yes a TQD will need to be established and set, and documented, for all service users as this will be the nominal date that follow-up dates are based upon.

Some service users lapse during their treatment and cessation services often recommend that they set another quit date. However, for the purposes of measuring quit rates the first quit date must be used. For example if someone sets a quit date on the 1st January, lapses in the second week and sets another quit date on the 21st January, the 3-month follow-up would start from the 1st January and occur on the 1st March.

What’s the difference between a lapse and relapse?

Generally a lapse is a single episode of smoking, where as relapse is a return to regular smoking. Service users who lapse can be helped back to abstinence (as in the example above). Service users who relapse are often advised to ‘have a break’ and make another quit attempt when they are ready. This means that they should be discharged from the cessation service and re-enrol when they are ready to quit again.

What about service users who enrol with cessation services who have already quit?

Cessation services might enrol service users who have already quit (e.g. those who quit in hospital and are referred to cessation services on discharge). In these cases the TQD can be the date Service users had the last cigarette.
When should service users be followed up?

Service users should be followed up at 4 weeks and 3 months after their TQD. The diagram below shows the timeline of client follow-up. The shaded bars represent the 4-week and 3-month outcome measures.

Why were these measures chosen?

The 4-week measure was chosen to allow for

- smoking lapses within the first 2 weeks after the TQD
- comparison with the outcomes of the UK NHS Stop Smoking Service, which is the largest and most developed publicly funded cessation service in the world; and
- the estimation of 1-year quit rates

It can be assessed as part of routine clinical practice as part of treatment.

The 3-month measure was included following discussion with some service providers as it was thought that only counting 4-week abstainers would not demonstrate the achievement of some smokers who struggle to quit within the first 4-weeks. In order to capture these ‘late quitters’ this additional outcome measures sustained abstinence, over the past 4 weeks, at 3-months after the TQD.

How often should smoking status be measured in service users attending a cessation service?

All cessation services should routinely record the smoking status of their service users at each contact.¹ This is should be seen as standard practice and not just about reporting to funders. Reporting outcomes should be simple for cessation services that follow-up their service users on a regular basis. Some basic examples of how smoking status can be recorded are shown in appendix 2.

Should self-reported abstinence be biochemically validated?

Yes, wherever possible self-reported abstinence should be validated with a carbon monoxide reading of less than 10ppm. It is acknowledged that this will not be possible for services that do not provide face-to-face support.

¹ At each contact Service users can simply be asked ‘Since I last saw you/spoke to you have you smoked at all?’ (a) No, not a single puff; (b) Yes, just a few puffs; (c) Yes, between 1 and 5 cigarettes; (d) Yes, more than 5 cigarettes.
Carbon monoxide monitors

Carbon monoxide (CO) monitors are a useful tool for cessation services. Apart from verifying self-reported smoking status, CO monitors are a good motivation tool. For example, smoking service users who have CO readings typically greater than 10 ppm will find that, when they stop, their CO readings drop below this level - and often below 5 ppm.

What do you do if the client is late in attending for follow-up?

It is not always possible to see service users exactly 4-weeks and 3-months after their target quit day. Follow-up should be done as close to the scheduled date as possible (e.g. +/- 3 days is acceptable), however smoking behaviour (i.e. quit or smoking) after the scheduled date should not be counted (see appendix 2 for more examples)

Example of a late follow-up

If a client’s 3-month follow-up was due on the 7th of April, but they we not followed up until the 21st of April (i.e. two weeks late), then they will need to be asked if they have smoked at all over the 4-week period between 10th March and 7th April.’

See appendix 2 for some more examples

In reality many of the service users who avoid follow-up do so because they have relapsed and feel embarrassed by their perceived failure. However some service users will have a genuine reason for not replying (e.g. away from home) but may respond sometime after their follow-up point.

If SCS are following up service users past 3 months, should they continue to measure smoking cessation outcome?

Yes absolutely. The same question used at 3-months can be used at other time-points (e.g. 6 months and 12 months). Services are also encouraged to measure continuous abstinence. This can be easily calculated from client records that record smoking status at each contact. Continuous abstinence rates, that are CO validated, are the most conservative measure of smoking cessation outcome.
Appendix 1: Measurement of outcomes of smoking cessation treatments in New Zealand

Background

Different definitions of abstinence are used in different literature on smoking cessation. There are variations in methods (and time periods) used to measure abstinence rates and rates can vary depending on the criteria used. Lack of a standard definition in New Zealand has led to some confusion in reporting and interpretation of smoking cessation data.

Although ‘seven day point prevalence’ (not smoking for seven days prior to service follow-up) is used for most smoking cessation service providers in New Zealand, not all service providers have adhered to this quit definition. This is because a standard measurement of abstinence has not been included as a contractual obligation. Different smoking cessation providers have therefore tended to use the definition of quit they are most familiar with, or were recommended or trained to adopt and implement.

Inconsistent criteria have made it difficult to assess the effectiveness of smoking cessation programmes, preventing comparisons and learnings between services.

What are the different ways of recording and defining abstinence rates?

Abstinence rates can vary depending on the measurement criteria used (see Appendix 1). The generally accepted ‘gold standard’ for measuring outcomes is to measure continuous abstinence that is biochemically validated (e.g. by measuring carbon monoxide in expired breath of less than 10 parts per million). Studies that have reported both continuous and point prevalence abstinence rates have demonstrated that these rates can vary substantially, with point prevalence usually producing higher rates.

Purpose of this document

The Ministry of Health (MoH) wishes to adopt a standard definition of abstinence to be used across all smoking cessation services. This document outlines the preferred option for measuring abstinence. The MoH wishes to consult key stakeholders regarding these outcome measures.

Measurement of smoking cessation outcomes

The Ministry of Health considered a number of different outcome measures. Following internal discussion and consultation with international experts the following measures the preferred options for use by New Zealand smoking cessation services.
The preferred outcome measure will determine abstinence at two time-points: (1) 4-weeks after the target quit date (TQD) and (2) 3-months after the TQD. This means that services will be expected to follow-up Service users at these two time points.

(1) Measurement of 4-week abstinence

This will be based on the UK NHS Stop Smoking Services definition. That is sustained abstinence in the last two of 4-weeks of treatment. The advantages of this measure is that it (a) allows for slips/lapses within the first 2 weeks after the TQD; (b) allows for international comparison of quit rates for smoking cessation programmes; and (c) allows for the estimation of 1-year quit rates. Where ever possible self-reported abstinence should be validated with a carbon monoxide reading of less than 10ppm. It is acknowledge that this will not be possible for services that do not provide face-to-face support.

How will this be measured?

Service users of smoking cessation services will need to be follow-up at 4-weeks after their TQD. At this follow-up service users should answer the following question by choosing one of the four options.

Over the past 2 weeks have you smoked at all?
(a) No, not a single puff
(b) Yes, just a few puffs
(c) Yes, between 1 and 5 cigarettes
(d) Yes, more than 5 cigarettes.

Only those who answer ‘(a) No, not a single puff’ will qualify as 4-week abstainers.

(2) Measurement of 3-month abstinence

Following discussion with some service providers it was thought that only counting 4-week abstainers would not demonstrate the achievement of some smokers who struggle to quit within the first 4-weeks. In order to capture these ‘late quitters’ this additional outcome will measure sustained abstinence, over the past 4 weeks, at 3-months after the TQD. Again, where ever possible self-reported abstinence should be validated with a carbon monoxide reading of less than 10ppm.

How will this be measured?

Service users of smoking cessation services will need to be follow-up at 3-months after their TQD. At this follow-up Service users should answer the following question by choosing one of the four options.

Over the past 4 weeks have you smoked at all?
(a) No, not a single puff
(b) Yes, just a few puffs
(c) Yes, between 1 and 5 cigarettes
(d) Yes, more than 5 cigarettes.
Only those who answer ‘(a) No, not a single puff’ will qualify as 3-month abstainers.

**Setting a Target Quit Date (TQD)**

A TQD will need to be set, and documented, for all service users as this will be the nominal date that follow-up dates are base upon. Some service users, who don’t initially succeed may set another quit date. However, for the purposes of measuring quit rates the first quit date must be used. For example if someone sets a quit date on the 1st January, slips in the second week and sets another quit date on the 21st January, the 3-month follow-up would occur on the 1st March.

**Calculation of abstinence rates**

Self-reported abstinence rates should be calculated as:

\[
\frac{\text{Number of smokers who meet the abstinence criteria above}}{\text{Number of smokers who set a quit date and received at least one treatment session on or prior to the quit date}} \times 100
\]

Validated abstinence rates should be calculated as:

\[
\frac{\text{Number of smokers who meet the abstinence criteria above AND have a breath CO measurement of < 10 ppm}}{\text{Number of smokers who set a quit date and received at least one treatment session on or prior to the quit date}} \times 100
\]

**Inclusion/Exclusion of people in calculations**

- People who attended for a session prior to quitting (e.g. for information only) but did not set a quit date should not be counted.
- People who had stopped smoking before attending the service should not be counted.
- The denominator must include all smokers who set a quit date and received at least one treatment session on or prior to the quit date. This includes smokers that could not be contacted for follow-up.
- People who have died before follow-up may be removed from the denominator.
Appendix 2: Examples of using the outcome measures

First here are some examples of using the two outcome measures assuming minimal contact with Service users (e.g. one pre-quit session and two follow-ups).

Example 1

Client name: Mere Morrison

<table>
<thead>
<tr>
<th>Session</th>
<th>Scheduled follow-up</th>
<th>Actual Date of contact</th>
<th>Smoking status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-quit</td>
<td></td>
<td>08/01/10</td>
<td>Smoking daily</td>
</tr>
<tr>
<td>TQD</td>
<td>15/01/10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 4*</td>
<td>12/02/10</td>
<td>12/02/10</td>
<td>Not a single puff</td>
</tr>
<tr>
<td>3 months**</td>
<td>15/04/10</td>
<td>18/04/10</td>
<td>Not a single puff</td>
</tr>
</tbody>
</table>

*Asked 'Over the past 2 weeks have you smoked at all?'
**Asked 'Over the past 4 weeks have you smoked at all?'

This client is abstinent at both 4-week and 3-month time-points. The 3-month follow-up contact was 3-days late, but within the acceptable bounds of +/- 3 days.

Example 2

Client name: Serena Simons

<table>
<thead>
<tr>
<th>Session</th>
<th>Scheduled follow-up</th>
<th>Actual Date of contact</th>
<th>Smoking status</th>
<th>CO reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-quit</td>
<td></td>
<td>08/01/10</td>
<td>Smoking daily</td>
<td>26 ppm</td>
</tr>
<tr>
<td>TQD</td>
<td>15/01/10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 4*</td>
<td>12/02/10</td>
<td>19/02/10</td>
<td>Not a single puff</td>
<td>2 ppm</td>
</tr>
<tr>
<td>3 months**</td>
<td>15/04/10</td>
<td>15/04/10</td>
<td>Not a single puff</td>
<td>3 ppm</td>
</tr>
</tbody>
</table>

*As this is a week late the smoking status will need to be assessed between the 29th of January and 12th of February.
**Asked 'Over the past 4 weeks have you smoked at all?'

This client is abstinent (CO validated) at both 4-week and 3-month time-points. The 4-week follow-up was late, but as she had not smoked at all over the past 3-weeks she can be considered a 4-week abstainer.

Example 3

Client name: John Peters

<table>
<thead>
<tr>
<th>Session</th>
<th>Scheduled follow-up</th>
<th>Actual Date of contact</th>
<th>Smoking status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-quit</td>
<td></td>
<td>08/01/10</td>
<td>Smoking daily</td>
</tr>
<tr>
<td>TQD</td>
<td>15/01/10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 4*</td>
<td>12/02/10</td>
<td>21/02/10</td>
<td>1-5 cigarettes –</td>
</tr>
</tbody>
</table>
This client had a lapse at a party on the 10th of February. As this is within the 2-week window he is not considered a 4-week abstainer. He is however a 3-month abstainer.

Example 4

Client name: Steve Jenkins

<table>
<thead>
<tr>
<th>Session</th>
<th>Scheduled follow-up</th>
<th>Actual Date of contact</th>
<th>Smoking status</th>
<th>CO reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-quit</td>
<td></td>
<td>08/01/10</td>
<td>Smoking daily</td>
<td>15 ppm</td>
</tr>
<tr>
<td>TQD</td>
<td>15/01/10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 4*</td>
<td>12/02/10</td>
<td>13/02/10</td>
<td>Not a single puff</td>
<td>3 ppm</td>
</tr>
<tr>
<td>3 months **</td>
<td>15/04/10</td>
<td>28/04/10</td>
<td>More than 5 cigs – daily smoking started on 01 April 2010</td>
<td>13 ppm</td>
</tr>
</tbody>
</table>

*Asked ‘Over the past 2 weeks have you smoked at all?’

**As this follow-up is almost 2-weeks late then the service users smoking status should be assessed between the 12th of March and 9th of April.

This client is abstinent (CO validated) at the 4-week but reports relapsing on the 1st of April. He is therefore not considered a 3-month abstainer.

The following are examples of more regular follow-up would be provided by services such as Aukati KaiPaipa. In these cases smoking status is documented at each visit.

At each contact point after the TQD service users can be asked ‘Since I last saw you/spoke to you have you smoked at all?’; giving the following choice of responses: (a) No, not a single puff; (b) Yes, just a few puffs; (c) Yes, between 1 and 5 cigarettes; (d) Yes, more than 5 cigarettes.

Example 5

Client name: George Jackson

<table>
<thead>
<tr>
<th>Session</th>
<th>Scheduled follow-up</th>
<th>Actual Date of contact</th>
<th>Smoking status*</th>
<th>CO reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-quit</td>
<td></td>
<td>01/01/10</td>
<td>Smoking daily</td>
<td>26 ppm</td>
</tr>
<tr>
<td>TQD</td>
<td>08/01/10</td>
<td></td>
<td>Smoking daily</td>
<td>30 ppm</td>
</tr>
<tr>
<td>Week 1</td>
<td>15/01/10</td>
<td>15/01/10</td>
<td>1-5 cigarettes</td>
<td>7 ppm</td>
</tr>
<tr>
<td>Week 2</td>
<td>22/01/10</td>
<td>22/01/10</td>
<td>Not a single puff</td>
<td>2 ppm</td>
</tr>
<tr>
<td>Week</td>
<td>Date 1</td>
<td>Date 2</td>
<td>Smoking Status</td>
<td>CO Reading</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>----------</td>
<td>------------------</td>
<td>------------</td>
</tr>
<tr>
<td>3 months</td>
<td>15/04/10</td>
<td>15/04/10</td>
<td>Not a single puff</td>
<td>2 ppm</td>
</tr>
</tbody>
</table>

*since last session

Note that all follow-up sessions are based on the target quit date (TQD).

In this example the client would be considered to be quit at 4 weeks (not a single puff in the past 2 weeks) and at 3 months (not a single puff in the past 4 weeks). Both smoking status reports are CO validated.

**Example 6**

**Client name:** Sally Jones

<table>
<thead>
<tr>
<th>Session</th>
<th>Scheduled follow-up</th>
<th>Actual Date of contact</th>
<th>Smoking status*</th>
<th>CO reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-quit</td>
<td>08/01/10</td>
<td>Smoking daily</td>
<td>18 ppm</td>
<td></td>
</tr>
<tr>
<td>TQD</td>
<td>15/01/10</td>
<td>Smoking daily</td>
<td>12 ppm</td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td>22/01/10</td>
<td>22/01/10</td>
<td>Not a single puff</td>
<td>2 ppm</td>
</tr>
<tr>
<td>Week 2</td>
<td>30/01/10</td>
<td>30/01/10</td>
<td>Not a single puff</td>
<td>3 ppm</td>
</tr>
<tr>
<td>Week 3</td>
<td>05/02/10</td>
<td>05/02/10</td>
<td>1-5 cigarettes</td>
<td>6 ppm</td>
</tr>
<tr>
<td>Week 4</td>
<td>12/02/10</td>
<td>19/02/10</td>
<td>Not a single puff</td>
<td>2 ppm</td>
</tr>
<tr>
<td>Week 8</td>
<td>12/03/10</td>
<td>12/03/10</td>
<td>Not a single puff</td>
<td>1 ppm</td>
</tr>
<tr>
<td>3 months</td>
<td>15/04/10</td>
<td>15/04/10</td>
<td>Not a single puff</td>
<td>2 ppm</td>
</tr>
</tbody>
</table>

*since last session

Here the client starts well, but slips in the 3rd week. She is also late for her 4-week follow-up, where she reports not smoking since her last contact (2 weeks ago). In this example the client would not be considered abstinent at 4 weeks (as she had smoked in the last 2 weeks of her scheduled 4-week follow-up date), but would be considered abstinent at 3 months (not a single puff in the past 4 weeks).

**Example 7**

**Client name:** Harley Davidson

<table>
<thead>
<tr>
<th>Session</th>
<th>Scheduled follow-up</th>
<th>Actual Date of contact</th>
<th>Smoking status*</th>
<th>CO reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-quit</td>
<td>08/01/10</td>
<td>Smoking daily</td>
<td>22 ppm</td>
<td></td>
</tr>
<tr>
<td>TQD</td>
<td>15/01/10</td>
<td>Smoking daily</td>
<td>24 ppm</td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td>22/01/10</td>
<td>22/01/10</td>
<td>More than 5 cigs – still smoking daily</td>
<td>19 ppm</td>
</tr>
<tr>
<td>Week 2</td>
<td>30/01/10</td>
<td>30/01/10</td>
<td>1-5 cigarettes</td>
<td>5 ppm</td>
</tr>
<tr>
<td>Week 3</td>
<td>05/02/10</td>
<td>05/02/10</td>
<td>Not a single puff</td>
<td>5 ppm</td>
</tr>
<tr>
<td>Week 4</td>
<td>12/02/10</td>
<td>12/02/10</td>
<td>Not a single puff</td>
<td>2 ppm</td>
</tr>
<tr>
<td>Week 8</td>
<td>12/03/10</td>
<td>22/03/10</td>
<td>More than 5 cigs – smoking daily</td>
<td>Not done</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>----------</td>
<td>---------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>3 months</td>
<td>15/04/10</td>
<td>15/04/10</td>
<td>Not a single puff</td>
<td>2ppm</td>
</tr>
</tbody>
</table>

*since last session

In this example the client would be considered abstinent at 4 weeks. However he had relapsed between week 4 and the next date of contact (a late week 8 follow-up). Even though he managed to stop smoking again he could not be counted as a 3-month abstainer as he was abstinent for less than 4-weeks at this follow-up.