Workplace Wellbeing Cost Effectiveness Analysis (CEA) Calculator

User manual

Andrew Bryce, Mark Bryan, Sara Connolly and Emike Nasamu

For any queries, please contact Sara.Connolly@uea.ac.uk

Contents

Click on the content item to jump to that section.

Introduction

This user manual provides the information needed to use the Workplace Wellbeing Cost Effectiveness Analysis (CEA) Calculator.

The CEA Calculator is a Microsoft-Excel based programme developed by researchers at the University of Sheffield and the University of East Anglia. It is designed particularly to measure the cost-effectiveness of wellbeing initiatives and programmes delivered in the workplace, where the goal is to improve staff wellbeing across an organisation or industry.

This manual is designed as a reference both for people wanting to use the Calculator directly and for those with a broader interest in exploring the cost-effectiveness of wellbeing interventions in the workplace. Please use the links on the contents page and elsewhere to navigate around the document as required, and feel free to ignore any pages of less interest or relevance.

A glossary is provided on the next page to provide specific definitions of the different terms used in this manual and the Calculator itself.

Glossary

Control group: The group of people who took part in the intervention trial but were allocated to the group who did not receive the intervention. These people should be as similar as possible to the participants receiving the intervention (including working in the same workplace or industry), and their wellbeing should be measured at the same time and in the same way as the participants.

Cost: Any resource expended on the intervention that would not have been expended had the intervention not been implemented. For full details of which costs should and should not be included in the Calculator, please see the section on Costs.

Cost-effectiveness ratio: A measure of how much it costs (to a particular organisation or to society as a whole) to improve one person's wellbeing by a certain amount. The precise definition used in the Calculator is the average cost of improving the life satisfaction of one person by one point on a 0-10 scale for one year.

Delivery personnel: Any people who spent time delivering the intervention, but who were not themselves participants. This may include people internal or external to the organisation where the intervention was delivered, and may include volunteers or people being paid for their time.

Intervention: Any initiative or programme implemented with the intention of improving wellbeing. Ideally, this intervention should be introduced as a part of a trial, where one group of people participate in the intervention while a similar group of people (the control group) do not.

Life satisfaction: A widely used measure of wellbeing that is the main 'unit of currency' in the Calculator. A person's life satisfaction is their response to a question similar to: "Overall, how satisfied are you with your life nowadays?" Respondents can provide an answer between 0 and 10 where 0 means "not at all satisfied" and 10 means "completely satisfied". The Calculator converts all other measures of wellbeing into life satisfaction units.

Participants: The people who received the intervention. In most cases, the participants are staff working in the workplace or industry where the intervention was implemented. This does not include people taking part in the trial but who do not receive the intervention, as these people form the control group.

Productivity: The amount of output a person produces in their job in a given period of time. Wellbeing interventions may influence workers' productivity, for example by improving their skills, helping them to become more motivated or improving their mental and physical health. See the section on Productivity Benefits for more information on how to measure impact on productivity.

Quality adjusted life year (QALY): A common outcome measure appropriate for all healthcare interventions. One QALY can be interpreted as one person living for one year in 100% full health or living for two years in 50% of full health.

Statistical significance: The degree to which we can be sure that a true result has been found. To account for possible measurement error, the Calculator provides lower and upper bounds for an estimated cost-effectiveness ratio, where we can be 95% confident that the true result lies between these two bounds.

Wellbeing: A broad term that describes the extent to which a person has a good life. Wellbeing can be measured in lots of different ways. Please see the section on Wellbeing

Measures to find precise definitions of the different measures compatible with the Calculator, which all focus on individual wellbeing. To ensure consistency, the Calculator converts all individual wellbeing measures into life satisfaction.

What is the CEA Calculator?

Most people agree that improving people's wellbeing is a good thing. This is not only desirable for its own sake but can also help to meet other important objectives for society and business, for example increased productivity, reduced absenteeism and savings for the NHS.

A report by the All-Party Parliamentary Group on Wellbeing Economics (2019) identifies improved wellbeing at work as one of the key priority areas for government and private sector investment in the UK. It recommends that employers routinely measure worker wellbeing and publish the results in annual accounts. The report also recommends that employers put policies and programmes in place, which train line managers in how to promote wellbeing, address the management of mental health problems and give people more control over how they do their jobs.

However, the development and implementation of initiatives aimed at improving wellbeing will almost always involve a cost. This means that we have to ask some important questions.

For example:

> Is what we spend on improving wellbeing worth it relative to the number of people helped and how much their wellbeing improves?
>
> If there are lots of different ways in which we can spend our resources to improve wellbeing, which one is the most effective?

Cost Effectiveness Analysis (CEA) helps us to answer these questions. It provides a common measure that we can use to compare the cost-effectiveness of different initiatives and programmes all aimed at improving wellbeing.

By building up our collective knowledge about what works (or what doesn't) and how much it costs, we can design better initiatives which will improve wellbeing in the future.

The CEA Calculator is designed particularly to measure the cost-effectiveness of wellbeing initiatives and programmes delivered in the workplace, where the goal is to improve staff wellbeing across an organisation or industry. The Calculator is a Microsoft-Excel based programme developed by researchers at the University of Sheffield and the University of East Anglia, and draws on principles and methods developed by Layard (2016) through the What Works Centre for Wellbeing.

Who can use it?

You do not need to have any specialist knowledge or expertise to use the Calculator. These notes and worked examples will show you not only how to use the Calculator but also how to interpret the results across a range of examples.

The CEA Calculator is designed for anyone who has implemented or is planning to implement any sort of intervention with the aim of improving the wellbeing of staff in a workplace. This may include general managers or human resource managers in businesses, charities or public sector organisations, or officials or researchers undertaking a cost-effectiveness assessment on behalf of a workplace.

The Calculator can be used at all stages of an intervention from assessing options and designing a trial through to monitoring and evaluating the success of an intervention.

Data should be collected or estimated on how much the intervention cost and how effective it is at improving wellbeing (measured on a recognised numerical scale). Ideally, the data will have been collected as part of a trial, where some people (the participants) received the intervention while a similar group of people (the control group) did not. The Calculator can still be used even if there was no control group although, as explained later, this means that the estimated cost-effectiveness ratio (CER) should be treated with caution.

To use the Calculator, you must have a recent version of Microsoft Excel installed on your computer, with macros enabled. The Calculator is also compatible with Excel for Mac.

What information do you need?

The quality and confidence you can have from the outputs from this Calculator are dependent on the quality of the data that you can input with respect to your intervention.

Minimum data requirement: A basic before and after evaluation of your intervention, which can measure a change in the wellbeing of participants. This means that you will have surveyed participants before they are exposed to any aspect of the intervention (this is your baseline data, without which you will not be able to identify if any change has occurred), and at some point after the intervention, in both cases asking the same question which captures their individual wellbeing. You must also have data on the estimated costs of the intervention.

Higher quality estimates: A higher quality evaluation method will give you more confidence in the robustness of your results from the Calculator, particularly with respect to taking into account changes that would have happened to the wellbeing of participants without the intervention and the duration of any wellbeing effects. Your evaluation can be improved from the minimum requirement by:

- Sampling more people and capturing data on their key characteristics, like gender, age etc. (a larger sample size reduces uncertainty with respect to all outcomes and can allow you to compare the results between different groups);
- Establishing a control group and ideally randomising between the participants and control group (to establish the counterfactual – what would have happened without the intervention);
- Repeating the data collection at several points after the intervention has been completed, to test the duration of the effect and whether it diminishes or increases over time;
- Measuring changes in sickness absence and productivity before and after, to fully take account of all changes which will affect the cost effectiveness calculation.

Here is a handy checklist of the basic information you need:

How many people participated in the intervention?	*Also, if you were using a control group, how many people were in the control group?*
How much did the intervention cost in UK pounds (GBP)?	*Think about how much time was spent on the intervention by each participant and any delivery personnel, how much they earn (if known) and what monetary expenses were incurred.*
Did the intervention have any benefits to the organisation in terms of reduced sickness absence or improved staff productivity, that can be quantified?	*If not, or you don't know, then you can just ignore this bit. Note, however, that any productivity benefits to the organisation are included in the calculation as negative costs.*
How much has wellbeing improved since the start of the intervention?	*You need to have asked all of your participants (and all of your control group) to state their wellbeing at the start of the intervention and at least once after the start of the intervention. All the different wellbeing measures compatible with the Calculator are listed here.*

Don’t worry too much if you don’t yet have all this information to hand or you think it may not be correct. You can go back into the Calculator as many times as you like to update and change your data.

If you are using the Calculator to help with planning an intervention then use your best possible estimates for expected number of participants, and expected costs and wellbeing benefits.

For more information on conducting an evaluation which captures changes in wellbeing, please refer to the What Works Centre for Wellbeing microsite for measuring impact.

There are important ethical issues to consider when collecting, storing and using people’s personal data. Please see The Research Ethics Guidebook for guidance on research ethics.

What will the Calculator tell you?

The Calculator compares the costs of the intervention which are measured in UK pounds (GBP) against the benefits which are measured by changes in life satisfaction - the net cost of improving one person's life satisfaction by one point on a 0-10 scale for one year. See Layard (2016) for an explanation of why life satisfaction has been chosen as the 'common currency'.

Clearly it is difficult to compare pounds with life satisfaction, so we use an approach similar to that used in health care where the cost of a treatment is assessed against the benefits of an extra year of life in perfect health, or a quality adjusted life year (QALY).

The final calculation presented by the calculator is comparable to the decision making used by the National Institute for Health and Care Excellence (NICE) which regards an intervention as cost-effective if an additional QALY costs less than £25,000. This is effectively the government's stated willingness to pay for an additional year of healthy life.

Because the QALY is assessed on a 0-1 scale, where 1 is full health and life satisfaction is assessed on a 0-10 scale, where 10 is completely satisfied, a cost of £25,000 per one QALY can be approximately translated to £2,500 for an additional one point improvement in life satisfaction per year. Therefore, an intervention which can deliver an extra point in life satisfaction over a year and costs less than £2,500 is considered to be cost-effective.

This is an indicative threshold used for the Calculator. Employers may identify higher or lower thresholds depending on their own willingness to pay for an improvement in wellbeing. For example, employers who want their investment in wellbeing interventions to at least break even (i.e. all spending should be fully recouped in terms of improved worker productivity) may wish to consider £0 as their default threshold.

The Calculator provides this calculation plus some illustrations which will give you an idea of how certain you can be of the results.

Note that improving the life satisfaction of participants may not be the only social benefit of these sorts of interventions. Wider benefits may include the improved wellbeing of family members or reduced demand for healthcare. These benefits cannot be captured by the Calculator so it is possible that the Calculator generates conservative estimates of the true cost-effectiveness of interventions to society.

Using the Calculator to plan an intervention

We expect that many users of the Calculator will already have data collected from an intervention that has completed or is ongoing. However, if you are still at the stage of planning an intervention then there are some steps you can take to design your intervention and evaluation strategy to make the best use of the Calculator.

Using the Calculator to compare options

If you are currently at the stage of developing different options for wellbeing interventions that might be appropriate for a particular workplace, then the Calculator can help. Taking each option in turn, use the Calculator to input the expected costs of the intervention and the predicted benefits in terms of productivity benefits and wellbeing effects. Of course, these expected effects will be highly uncertain so try different scenarios and compare the estimated cost-effectiveness ratio (CER) for each. The range of CERs generated should help to identify which option is likely to be the most cost-effective under different scenarios (see Step 7), and provide evidence to support the implementation of the intervention from decision makers and funders.

Using the Calculator to design an evaluation

If you are at the stage of being close to starting an intervention, here are some tips to ensure that, from the start, you will be collecting the right data to make best use of the Calculator and get a robust estimate of cost-effectiveness:

- Consider launching your intervention as a pilot or trial. This means that you avoid spending too much resource on an intervention before you have evidence about whether it works and whether it is cost-effective. This design also allows you to build in a control group (see below). To avoid contaminating your data, try to avoid timing an intervention such that your participants and/or control group are also receiving some other intervention that may affect their wellbeing.
- If feasible, your trial should include a comparison or control group. This is a group of people who do not receive the intervention directly but are willing to provide you with data about their wellbeing. The best evaluation design is a randomised control trial whereby a group of people are selected at random to participate in the intervention with the remainder forming the control group. If this randomisation is not possible, then try to ensure that the profile of the comparison group (or control group) is as similar as possible to the participants (for example in terms of gender, age, employment contract and job description). The members of the control group may receive some other benefits to compensate them for not participating, for example being next in line to receive the intervention in the future. The control group should not include those who refused to take part in the intervention.
- Think carefully about the size of your trial. The number of participants should not be too large as to make the trial disproportionately expensive but must be large enough to provide statistically robust results. We recommend that you have complete data on at least 50 participants and another 50 people in your control group. Ideally, the original sample size should be much larger than this to allow for some people possibly dropping out of the sample before the end of the evaluation.
- Ideally all of your participants and all members of your control group should be asked about their wellbeing before they start to receive the intervention. We strongly recommend that you ask a simple life satisfaction question, but you may want to ask other wellbeing questions as well. Further guidance about measuring wellbeing is

provided here. Please see The Research Ethics Guidebook for guidance on research ethics.

- Plan to ask all of your participants and control group to report their life satisfaction and/or other wellbeing measure again at least once after the intervention has started. This should be timed such that you would expect the intervention already to be having an effect. For the best results, consider surveying your participants and control group two or three times after the intervention has started (for example, once while the intervention is ongoing, once immediately after the intervention has been completed and once six or twelve months after the intervention has been completed). Make every effort to ensure that as many people as possible respond to these follow-up surveys, even those who for whatever reason did not engage with the intervention. Reassure people that their responses are anonymous and they should answer as honestly as possible.
- Plan to collect as much information as possible about how much the intervention cost. Include both monetary and non-monetary expenditure. Try to measure how much staff time was spent delivering or engaging with the intervention. You could elicit estimates about how much time participants spent engaging with the intervention, and whether this was work or non-work time, by including questions in the follow-up surveys (above). More information about how to estimate costs is provided here.
- Think about how to best measure changes in productivity that may be expected to occur as a result of the intervention. The best way of doing this will vary according to the type of workplace, but some ideas are provided here. It is important that changes in productivity and sickness absence are measured for both participants and control group.

For more information on conducting an evaluation which captures changes in wellbeing, please refer to the What Works Centre for Wellbeing microsite for measuring impact.

Using the Calculator for sub-group analysis

It is possible to use the Calculator to calculate CERs for particular sub-groups of your participants rather than simply relying on the average CER across all participants.

To do this, identify your sub-groups in advance (for example women and men, people in different job categories, people with specific mental or physical health problems, etc.) and make sure you have at least 50 participants, and at least 50 members of your control group, in each sub-group of interest. Once the trial is complete, take each sub-group in turn and use the Calculator to input the data relating to that group, as if they were the only people participating in the intervention. Save the spreadsheet and repeat the process with each of the other sub-groups.

You will then get a different CER for each sub-group which can be compared. You may find that the intervention is cost-effective if targeted at a particular group of people even if it may not be cost-effective on average across all participants in the trial.

Some examples

Here are some examples of randomised control trial interventions that have already been evaluated for their cost-effectiveness using the Calculator:

1) Problem-solving training for airline flight attendants (Ayres and Malouff 2007)
2) Resilience training for civil servants (Lloyd, Bond and Flaxman 2017) – this is the worked example shown in this manual
3) Online self-help goal-setting and planning intervention for working adults (Oliver and MacLeod 2018)
4) Community singing for older people (Coulton et al. 2015)
5) Mindfulness intervention for police officers (Fitzhugh et al. 2019)

Full references for these studies are provided here.

There are also a set of case studies which discuss work and wellbeing interventions and what might be learned by applying elements of a cost effectiveness analysis.

We would welcome further examples to add to our understanding, so please consider submitting details of your intervention. Instructions for how do this are provided here.

Step-by-step instructions

You are now ready to use the Calculator. Follow the step-by-step instructions to enter your data and interpret your results. We have also produced a worked example with screenshots which you may find helpful for reference alongside this step-by-step guide.

Step 1 – Getting started

Download the Calculator.

Open the Calculator in Microsoft Excel.

You may be asked whether you want to enable macros. The Calculator will not work properly without macros so make sure you allow macros to be enabled.

If macros are enabled, a welcome message box should come up. Click ***OK***.

Then click on the big ***Start*** button in the spreadsheet to start inputting your data.

Step 2 – Entering your data: participation

Having clicked on ***Start***, you will be taken to the Participation window. Read the information and click ***Next***.

Enter a name for your intervention and click ***Next***.

Enter how many participants took part in or received the intervention. If you don't know the exact number, please enter your best estimate. Click ***Next***.

You will now be asked whether your intervention was trialled using a control group. If you do have a control group, select ***Yes*** and enter the number of people in the control group. If not, select ***No***.

Click ***Finished*** to go to the next section, or ***Back*** if you need to change anything.

Step 3 – Entering your data: costs

Once you have clicked ***Finish*** in the Participation window, you will enter the Costs window.

Please read the introductory information and click ***Next***.

You are invited to input information on the total cost of your intervention. If you know how much the intervention cost in total, or can provide a good estimate, select ***Yes*** and input the figure in UK pounds (GBP).

See the section on Costs for more information about which costs should be included.

Click ***Next***, then skip to Step 4. If you do not want to input a total cost, select ***No*** and then click ***Next***.

On the next screen, you need to provide some information on how much your participants earn. This is to help estimate the cost of staff time that was spent engaging with the intervention. If your participants belong to different pay grades, the Calculator

allows you to split up participants into groups based on their pay grade. For each group, type in the number of participants (the sum of the three groups has to add up to the total number of participants entered in Step 2). Also type in an average gross hourly wage for each group *or* an average gross full-time equivalent annual salary, if you have this information to hand.

See the section on Costs for more information about how to calculate gross wages or salaries.

If you don't know the wages or salary of your participants, click ***Browse occupations***. This will take you to another screen where you can find the UK standard occupation classification that could best fit the job title of each group of your participants. Each Level 4 occupation has a four-digit Standard Occupation Code (SOC).

For example, the code for nurses, which can be found by selecting 'Professional occupations' then 'Health professionals' then 'Nursing and midwifery professionals', is 2231.

Make a note of this code and then click ***Close worksheet***. Now input that code for the relevant group and click ***Apply***. This brings up an average gross hourly wage for that occupation, taken from the UK Annual Survey of Hours and Earnings. You can change this manually if you want.

Once you have supplied information on the earnings of all your participants, click ***Next***.

Now please provide an estimate of the average amount of time that each participant spent engaging with the intervention, again split by group if you provided earnings data for more than one participant group on the previous screen. If you are only interested in the costs incurred by the employer, include work time only. If you are interested in the total cost to society, you should include both work and non-work time. This time can be measured in hours, days or weeks. Then click ***Next***.

The next screen allows you to identify anybody who spent time delivering the intervention (but were not themselves a participant or beneficiary). As before, you can split these people into up to three groups, providing a wage or occupation title for each group. Please remember also to specify the number of people in each group before clicking ***Next***.

As before, please provide an estimate of the amount of time each person in each group spent delivering the intervention. Click ***Next***.

Finally, you have the opportunity to include any other costs incurred by the intervention. This may include actual expenditure by the organisation or organisations delivering the intervention or may include the value of non-monetary resources used in the delivery. Again, think about whether you want to include only resources expended by the employer or the total cost to society of the intervention.

See the section on Costs for more information about which costs should be included.

Click ***Finish*** to move to the next window.

Step 4 – Entering your data: productivity benefits

Once you have finished the Costs window, you will enter the Productivity Benefits window where you will be required to enter data on any recorded changes in productivity which resulted from your intervention. Please read the introductory information and click ***Next***.

If you have the data, please use this screen to input how many more or fewer sickness days the participants in total (and the control group in total, if applicable) recorded over the 12 months after the intervention compared to the 12 months before. If your data covers a different period, you can change the number of months, although note that any effects beyond 12 months are ignored by the Calculator. If you do not have any reliable data on sickness absence, leave this screen unchanged and click ***Next***.

On the next screen, you have the opportunity to record any changes in productivity that can be measured since the start of the intervention. This should be expressed as a percentage change. Edit the number of months to reflect the time period over which this change occurred and was sustained.

Note that the Calculator uses the information you provided in Step 3 to estimate the average hourly wage of your participants and control group for the purposes of quantifying productivity benefits. If you did not provide wage data in Step 3, the Calculator assumes that the average wage of participants is the same as the national average.

Please see the section on Productivity Benefits for more information on how to measure impact on productivity.

If you have no reliable data about productivity changes then just click ***Finish*** without changing anything.

Step 5 – Entering your data: wellbeing

Once you have completed the Productivity Benefits window, you will enter the Wellbeing window. Please read the introductory information and click ***Next***.

Now please select whichever measure you have used to evaluate the wellbeing of the participants (and, if applicable, control group). Life satisfaction on a 0-10 scale is the preferred measure. If you have used any other measure, this will be 'converted' into life satisfaction units to calculate the Cost Effectiveness Ratio (CER).

Please see the section on Wellbeing Measures to find precise definitions of the different measures compatible with the Calculator.

Click ***Next***. You will either be taken to another menu or directly to the screen where you can input your wellbeing data. If the screen you end up on does not match the measure you have used to collect your data, then click ***Select different wellbeing measure***.

Firstly, enter the average (mean) wellbeing of your participants (and, if applicable, your control group) at baseline: ideally this should have been collected just before the participants began to receive the intervention. You can either enter the numbers directly into the text boxes (any number of decimal places is accepted) or use the scroll bars to find the number. The scroll bars are set to prevent you from selecting a number that falls outside the possible range for the measurement scale in question.

Only the participants and control group members that reported their wellbeing at all time points should be included. If anyone drops out of the trial or does not answer your survey, their wellbeing data should be removed from the analysis.

Next, enter the average (mean) wellbeing of your participants (and, if applicable, control group) for at least one point in time after the start of the intervention. If you have data for more than one post-intervention point in time, tick ***Time 2*** and ***Time 3*** as appropriate. Again, the wellbeing scores can be inputted into the text boxes either directly or by using the scroll bars.

You must also type in the number of weeks since the start of the intervention that the data was collected. This must be the same for the participants and control group.

If you know both the standard deviations of your data and the covariance between your post-intervention data and your baseline data, this can also be entered on this screen.

If you don't know these statistics, they are easy to calculate if you have the raw data to hand. Please go to the section on Calculating Statistics for some guidance on this.

If you do not know both the standard deviation and covariance and are not able to calculate it, then leave these boxes blank. In this case, the Calculator will automatically use default figures from overall population estimates to estimate the likely spread of your data.

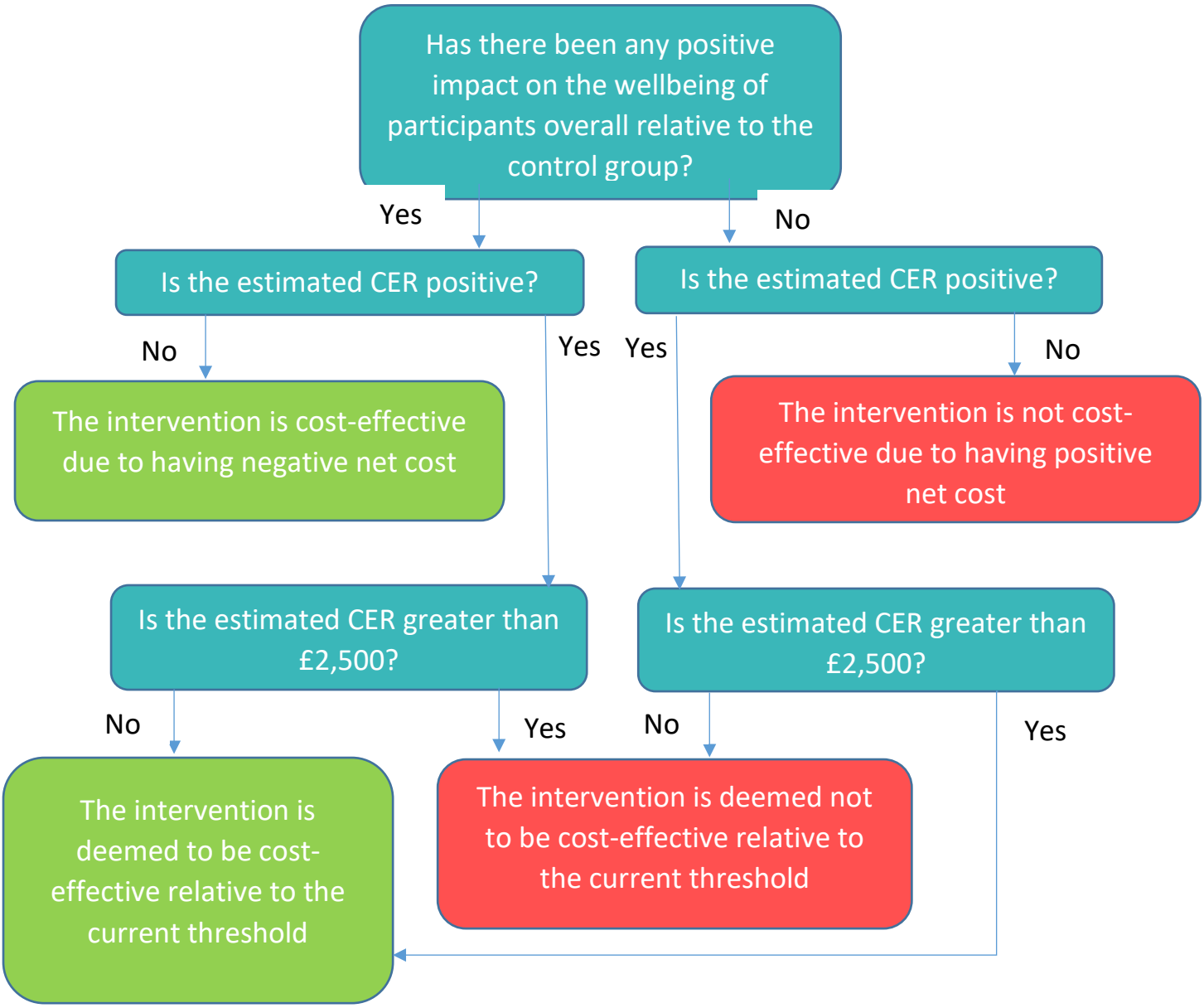
Once you have entered all your data, click ***Next***.

Finally, you will be asked to confirm the sample size of your data. This will default to the size of the participant group and control group specified in Step 2. However, sometimes not everyone is available to answer questions about their wellbeing at every point in time. Therefore, please provide the actual number of participants and control group members who reported their wellbeing at all time points.

Then click ***Finish***.

Step 6 – Interpreting your results

Having clicked ***Finish***, a message box will pop up telling you the estimated cost-effectiveness ratio (CER) of the intervention. This flowchart describes the different results you may get.



While the average change in wellbeing may be positive, it may not be statistically significant. In this case, a message box will appear to warn you of this. This will also be clear when looking at the graphs (see below).

If you have either not used a control group and/or based your intervention on a sample size of less than 50, further message boxes will appear to warn you that the results may not be robust.

Having clicked ***Finish***, you can now view your results in the worksheet itself. The main result is shown in cell B71. This assumes that the impact of the intervention lasts for just one year. Below this is a table showing the upper and lower bounds of the estimated CER and also how the result would change if we assumed that the impacts last for two years and three years respectively.

Now look at the two graphs. The lower one shows how the impact on life satisfaction changes from the start of the intervention (time 0) to three years after the start of the intervention. The dashed lines show the upper and lower bounds of this estimate while the solid line shows the central estimate.

The upper graph plots the impact on life satisfaction against the net cost per participant. The red cross shows the central estimate while the length of the red line shows the possible upper and lower bounds of this estimate. If the red line falls totally in the green area, then we can say for certain that the intervention is cost-effective (relative to the £2,500 threshold). If the red line falls totally in the red area, then we can say for certain that the intervention is not cost-effective. If the red line bisects the blue line separating the green area and the red area, then we cannot be sure either way.

You can find out more about how the Calculator calculates the CER here.

Step 7 – Editing your data

You may want to change any of the data that you entered into the Calculator. This might be because you have made a mistake and need to go back and change something. Or you might want to try different scenarios to see how changing particular values affects the overall result.

Also, you might want to calculate the cost-effectiveness for a particular sub-group of participants that you are able to identify from your data, or you might want to estimate a different CER that only takes into account costs incurred by the employer.

If you want to compare CERs for different interventions, sub-groups, assumptions or scenarios, then it is a good idea to save the Excel file with a file name of your choice before going back to make changes to your data. The edited version of the spreadsheet can then be given a different file name, so you can compare the two sets of results later. The big green box at the bottom of the worksheet can be used to make any notes, which may be particularly helpful if you are creating more than one spreadsheet.

To edit your data, you can click ***Start*** and go back through the questions. The data you entered previously should still be there, so you can quickly click through the windows until you get to the window where you want to change something. Alternatively, you can change figures directly in the spreadsheet by changing any of the green cells. You can also change your wellbeing measure by using the drop-down menu in cell B58.

Step 8 – Using your results

We hope that the results you get from the Calculator will provide useful evidence to demonstrate the cost-effectiveness of an intervention and inform decisions about whether interventions should be rolled out to more participants or other workplaces. The results may also be used to help select between different options for improving wellbeing in an organisation.

As well as making use of the Calculator for your own purposes, we hope that you will consider sharing your results with us. At the What Works Centre for Wellbeing, we want to build up a repository of evidence on the cost-effectiveness of different types of wellbeing interventions.

You can also email your spreadsheet(s) to info@whatworkswellbeing.org. Also use this email address if you have any questions or need any help using the Calculator.

Estimating the cost of your intervention

To estimate the cost of your intervention, you firstly need to decide which costs are important to you and which costs can be ignored.

Many users will be interested in the total social cost of an intervention. This means that you need to consider all costs incurred by society as a whole, including the organisation and business delivering the intervention, the participants themselves and any other third party stakeholders such as the public sector or other organisations. This approach may be appropriate if the intervention has received external funding and funders are interested in how cost-effective the intervention has been for society as a whole, not just your organisation.

Other users will be more interested in the private costs, and therefore will only want to include costs incurred directly by the business or organisation providing the intervention. This may be the appropriate approach if, for example, you want to demonstrate the cost-effectiveness of an intervention to directors or shareholders.

You may want to estimate both the social costs and private costs of your intervention. In which, we recommend that you save two versions of the Calculator as described in Step 7.

Here is some guidance about the costs that should and should not be included in the Calculator.

Cost of time

For most interventions, a large share of the total cost will be a result of the amount of time spent by participants receiving the intervention and people involved in delivering the intervention. This is time that could have been spent on other productive activities, and therefore represents a cost to society and/or to the business.

DO include:

- The time spent by participants engaging with the intervention during work time when they were not otherwise carrying out their normal duties.
- **Social costs only -** The time spent by participants engaging with the intervention in their own free time. For simplicity, this should be valued at the same rate as time spent at work.
- The time spent by delivery personnel on delivering the intervention. This may include people already employed by the organisation where the intervention was delivered, people commissioned from outside the organisation and (**social costs only**) volunteers offering their time for free.

DO NOT include:

- The time spent by participants, members of the control group and delivery personnel engaging in monitoring and evaluation related activities (providing data, answering questionnaires, designing the evaluation etc.). This is time that is not being spent directly on providing and receiving the intervention.
- The time spent on activities that would have been undertaken anyway in the absence of the intervention.

In some cases, it may not be clear whether or not a particular activity would have taken place without the intervention. Here is an example:

Suppose a trainer spends 12 hours designing a training course and preparing materials. These training resources were used for the intervention but also for two other projects not related to the intervention. In this case, it may be appropriate to split up the cost between the three projects. So the time spent by the trainer on preparing for the intervention is 12 x 0.33 = 4 hours.

Valuing an hour of time

The default position of the Calculator is to value a person's time according to their gross hourly wage. This is a measure of how much a person gets paid per hour before deducting tax, national insurance, pension contributions and other deductions. As this gross hourly wage usually underestimates the true cost of a person's time to their employer, the Calculator automatically increases this figure by 25% to account for additional costs such as employers' national insurance and pension contributions, training and recruitment costs etc.

For many people, pay is specified as an annual salary rather than an hourly wage. The Calculator allows you to input a gross annual salary for your participants and delivery personnel. In this case, it is important to provide a full time equivalent (assumed to be 2,080 hours per year) salary for any part time workers.

What if some of your participants are not employed?

The CEA Calculator is specifically designed for workplace interventions so we assume that most participants will be employed and therefore their hourly earnings provide a good approximation of the value of their time. However, it is possible to use the Calculator for interventions where some or all of the participants are not employed (e.g. unemployed people, retired people, children). In this case, please use your own judgement to estimate the value of participants' time. It may be appropriate to value this at zero (for example if engaging with the intervention is a leisure activity that they would enjoy doing anyway) or at the minimum wage or median wage (if the time incurred is costly in terms of replacing other productive activities, such as job search or volunteering).

Other costs

You should also include any other costs incurred as a result of the intervention that would not have been incurred otherwise.

This may include actual expenditure by the organisation or organisations delivering the intervention or may include the value of non-monetary resources used in the delivery.

If the intervention involved purchasing assets (e.g. land, buildings, vehicles or equipment) that will also be used for other things, then the cost should be the total value of the asset multiplied by the proportion of the total lifetime of the asset where it was used for your intervention. For example, say that the intervention involved the purchase of ten smartphones at £100 each. These smartphones were used by the participants for one year but are expected to be kept by the organisation for another four years before being disposed. Therefore, the true cost of this asset for the intervention is £1,000 x 0.2 = £200.

Use a similar calculation if the intervention involved making use of an asset already owned. An alternative method for valuing the use of assets is to estimate how much this would have cost had the asset been rented rather than owned. For example, say that the intervention

involved use of the company's boardroom for a whole day. If this room was hired by an external organisation, they would have paid £500 so that is the true cost. It is important to incorporate this cost because even though the use of the room involves no direct financial cost to the company, it is being made unavailable for other productive uses so still represents an economic cost.

If you are estimating the social cost of the intervention, it doesn't matter who actually paid for the resources used by the intervention. Even if those resources were given for free (i.e. no money changed hands), you still need to include them. However, if you are estimating the private cost, only include resources paid for by the employer in question.

Estimating productivity benefits

Evidence shows that improvements in employee wellbeing may in turn deliver productivity benefits for an employer.

In the Calculator, any productivity benefits that can be quantified are included as negative costs. Productivity benefits may be incurred through reduced sickness absence of an employee, or increased output (through reduced presenteeism, or higher effort or ability in the workplace). There are also benefits to employers from improved wellbeing of employees that cannot be quantified through productivity measures, which include greater creativity and improved customer satisfaction. These are outside the scope of the Calculator, but suggest that any estimates of the cost effectiveness of an intervention which delivers wellbeing benefits are conservative from the employer's perspective.

One possible benefit of interventions focused on wellbeing is an improvement in mental and physical health which could lead to reduced sickness absence. If you have data on changes in sickness absence for the participants and control group, you can input these figures directly in the Productivity Benefits window.

There are of course many other ways in which improved worker wellbeing may influence productivity. These can all be captured by estimating a percentage change in productivity across the participants and control group as a whole. The sorts of changes that might constitute a productivity benefit will vary depending on the organisation where the participants and control group are employed, but here are some examples:

Following the intervention, the participants may be producing more (or less) output in the same amount of time. For example, the participants may be working on a production line producing widgets. If they were producing 10 widgets per hour on average before the intervention but this had risen to 11 widgets per hour after the intervention, then this is a 10% improvement in productivity. If the participants produce a variety of different products, then work out the total monetary value of output produced by each worker before and after the intervention to estimate the productivity change.

If workforce productivity cannot easily be measured in terms of output (likely to be the case for many public and voluntary sector workers), then an alternative approach is to think about whether there have been any changes in the duties that the participants can perform competently, and how much this would affect their pay if they were to be paid the same amount as someone else recruited to perform those same duties. For example, before the intervention the participants on average may be earning £30,000 per year but, due to restricted duties, only be performing the job description of someone who would be earning £27,000 per year. If they are able to work to their full job description after the intervention, this represents a 10% productivity improvement.

It is important to remember that the productivity improvement you enter should be calculated as the average across all participants (or the whole control group). If only one person experiences a 10% productivity improvement and there are 100 participants altogether, then the overall productivity improvement is just 0.1%.

Often productivity in a workplace will improve even in the absence of an intervention (for example due to better capital or technology or increased customer demand). That is why it is important also to measure productivity changes in the control group (who would be exposed to the same outside influences). It is only the difference between the two groups that will generate a net productivity gain. If both the participants and the control group experience the

same increase in productivity then the Calculator assumes that there has been no productivity benefit as a result of the intervention.

It is recommended that if you are evaluating the intervention without a control group, you do not include productivity benefits or sickness absence benefits in your calculation, as this may risk overestimating the true benefits of the intervention.

If in doubt, we recommend that you err on the side of caution when estimating productivity effects. You may want to try lower percentage changes or remove the productivity benefits altogether to see how sensitive your CER estimate is to their inclusion. Please note that the Calculator only counts productivity benefits and sickness absence changes experienced in the first year, even if you say that these effects have been sustained for longer.

Remember, if you have no reliable data about productivity changes then just click ***Finish*** without changing anything in the Productivity Benefits window.

Estimating wellbeing benefits

All users of the Calculator must have data on the wellbeing of participants (and, if applicable, the control group) immediately before the start of the intervention and at between one and three points in time after the start of the intervention.

Life satisfaction

When deciding how to measure wellbeing, it is recommended that you use life satisfaction. This is the Calculator's main 'unit of currency'. It is also considered by many to be the most reliable indicator of how people feel about the quality of their lives.

To elicit a person's life satisfaction, ask them the following question (or something very similar): *"Overall, how satisfied are you with your life nowadays on a scale of 0 to 10, where 0 means not at all satisfied and 10 means completely satisfied?"*

As implied by the question, each respondent should give a numerical response between 0 and 10, and hence you should be able to calculate the average life satisfaction of the group.

Other wellbeing measures

If life satisfaction is not one the measures used to estimate wellbeing, then there are a range of other measures that can also be used with the Calculator. The Calculator will automatically convert these other measures into life satisfaction by means of an 'exchange rate'. (Some of these exchange rates are derived from Layard (2016), others from the authors' own calculations.) For example, the exchange rate between Worthwhile and Life Satisfaction is 0.75. This means that a 1 point improvement in someone's Worthwhile score is equivalent to a 0.75 point improvement in their life satisfaction.

The following table describes all the wellbeing measures that are compatible with the Calculator.

Wellbeing measure	Question or questions used	Range of possible scores	Exchange rate
Life satisfaction	*Overall, how satisfied are you with your life nowadays?*	0-10	1
Satisfaction with Life Scale	Multiple questions [Find questionnaire]	5-35	0.24
Worthwhile	*Overall, to what extent do you feel that the things you do in your life are worthwhile?*	0-10	0.75
Happy	*Overall, how happy did you feel yesterday?*	0-10	0.72
Anxious	*Overall, how anxious did you feel yesterday?*	0-10	0.35
General Health Questionnaire	Multiple questions (12-question version) [Find questionnaire]	0-36	-0.21
Short Warwick Edinburgh Mental Wellbeing Scale (SWEMBS)	Multiple questions [Find questionnaire]	7-35	0.25
Satisfaction with job	*How dissatisfied or satisfied are you with your present job overall?*	1-7	0.49
Satisfaction with income	*How dissatisfied or satisfied are you with the income of your household?*	1-7	0.61
Satisfaction with amount of leisure time	*How dissatisfied or satisfied are you with the amount of leisure time you have?*	1-7	0.57
Satisfaction with use of leisure time	*How dissatisfied or satisfied are you with the way you spend your leisure time?*	1-7	0.62
Satisfaction with social life	*How dissatisfied or satisfied are you with your social life?*	1-7	0.60
Satisfaction with health	*How dissatisfied or satisfied are you with your health?*	1-7	0.63

Source: Authors' own calculations and Layard (2016).

Calculating statistics

Average (mean) wellbeing

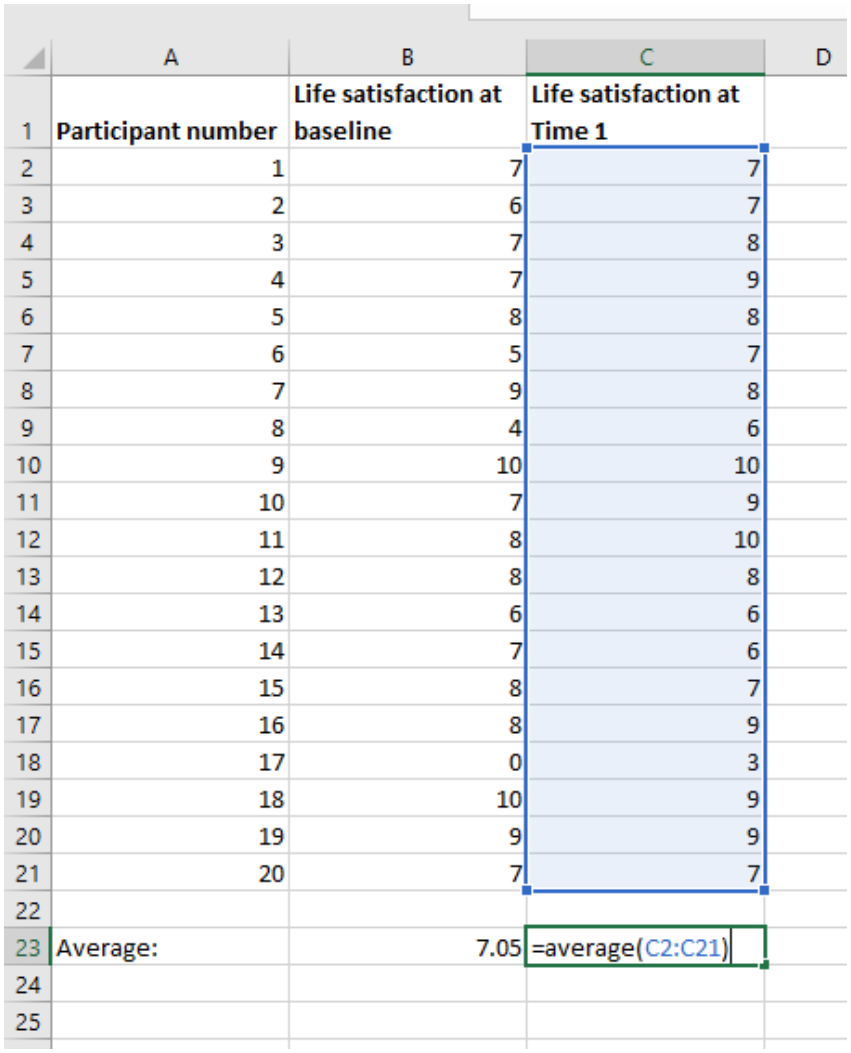
The only statistic that you have to calculate in order to use the Calculator is the average (mean) wellbeing for each group (participants and control group) at each point in time. This is very easy to calculate using Microsoft Excel or similar software.

We will now walk you through an example of how to calculate the average and other helpful statistics. In this fictional example, there are 20 participants (although note that we would normally expect sample sizes to be at least 50) and they have each provided a life satisfaction score between 0 and 10 at baseline and at Time 1. Remember, only include individuals who have responded in both (all) time periods covered by your evaluation.

Enter everybody's wellbeing score at baseline and Time 1 in two columns of a spreadsheet like this:

	A	B	C	D
1	Participant number	Life satisfaction at baseline	Life satisfaction at Time 1	
2	1	7	7	
3	2	6	7	
4	3	7	8	
5	4	7	9	
6	5	8	8	
7	6	5	7	
8	7	9	8	
9	8	4	6	
10	9	10	10	
11	10	7	9	
12	11	8	10	
13	12	8	8	
14	13	6	6	
15	14	7	6	
16	15	8	7	
17	16	8	9	
18	17	0	3	
19	18	10	9	
20	19	9	9	
21	20	6	7	
22				
23				
24				
25				
26				

Then use the AVERAGE function to take the average of each column, as shown:



	A	B	C	D
1	Participant number	Life satisfaction at baseline	Life satisfaction at Time 1	
2	1	7	7	
3	2	6	7	
4	3	7	8	
5	4	7	9	
6	5	8	8	
7	6	5	7	
8	7	9	8	
9	8	4	6	
10	9	10	10	
11	10	7	9	
12	11	8	10	
13	12	8	8	
14	13	6	6	
15	14	7	6	
16	15	8	7	
17	16	8	9	
18	17	0	3	
19	18	10	9	
20	19	9	9	
21	20	7	7	
22				
23	Average:	7.05	=average(C2:C21)	
24				
25				

Standard deviation and covariance

Alongside the average of your data, it is also helpful to estimate the spread or distribution of your data. This information is used by the Calculator to estimate upper and lower bounds around your central results and allows you to say that you are 95% confident that the true cost-effectiveness ratio lies between these two bounds.

If you have your data in the format shown in the screenshot above, it is very straightforward to calculate the statistics required by the Calculator. However, if your data cannot be presented in this way and you have no other way of calculating *both* the standard deviation and covariance of your data or you do not feel confident about doing so, then simply leave these boxes blank in the Wellbeing window and the Calculator will automatically use default statistics based on your wellbeing measure.

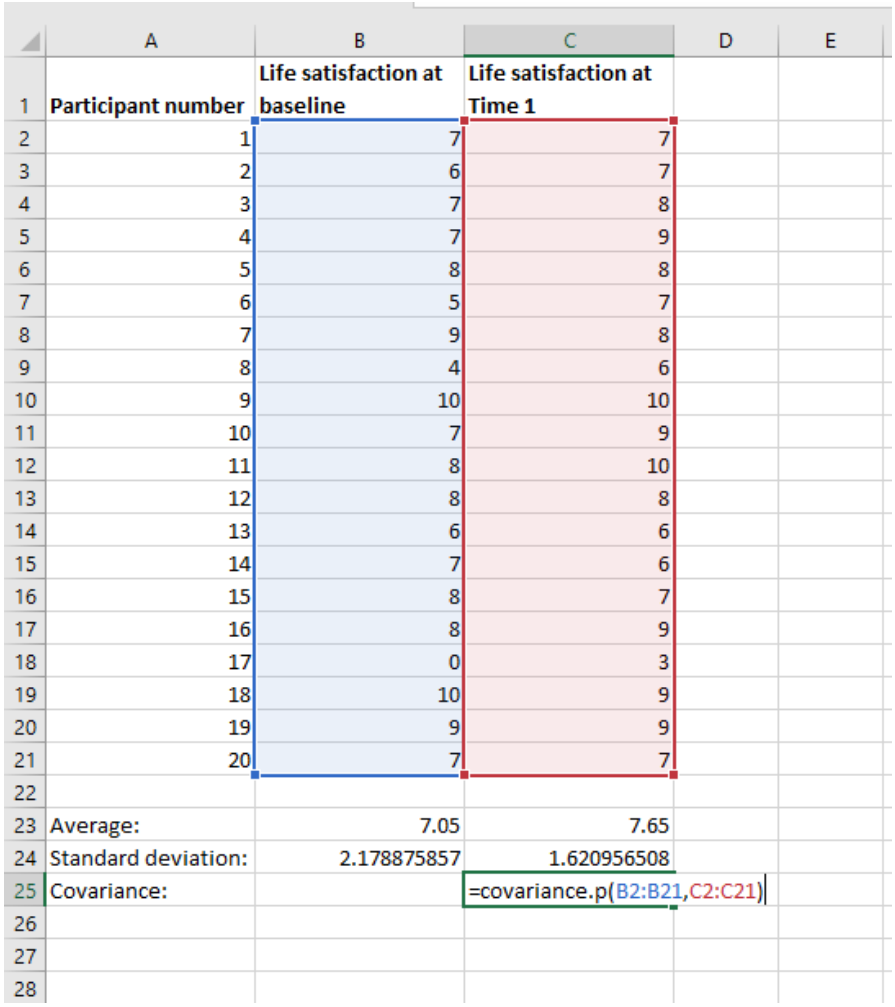
Standard deviation

This is a measure of the spread of your data. A higher standard deviation indicates that there is a big variation in the wellbeing scores within the group. To calculate the standard deviation for each column, use the STDEV.P function in Excel as shown:

	A	B	C	D
1	Participant number	Life satisfaction at baseline	Life satisfaction at Time 1	
2	1	7	7	
3	2	6	7	
4	3	7	8	
5	4	7	9	
6	5	8	8	
7	6	5	7	
8	7	9	8	
9	8	4	6	
10	9	10	10	
11	10	7	9	
12	11	8	10	
13	12	8	8	
14	13	6	6	
15	14	7	6	
16	15	8	7	
17	16	8	9	
18	17	0	3	
19	18	10	9	
20	19	9	9	
21	20	7	7	
22				
23	Average:	7.05	7.65	
24	Standard deviation:	2.178875857	=stdev.p(C2:C21)	
25				
26				
27				

Covariance

Covariance is a measure of correlation between two sets of data. A high covariance implies that there is a strong correlation between the wellbeing score of a given participant at baseline and the wellbeing score of the same participant at Time 1. To calculate the covariance between the Time 1 data and the baseline data, use the COVARIANCE.P function in Excel as shown:



	A	B	C	D	E
1	Participant number	Life satisfaction at baseline	Life satisfaction at Time 1		
2	1	7	7		
3	2	6	7		
4	3	7	8		
5	4	7	9		
6	5	8	8		
7	6	5	7		
8	7	9	8		
9	8	4	6		
10	9	10	10		
11	10	7	9		
12	11	8	10		
13	12	8	8		
14	13	6	6		
15	14	7	6		
16	15	8	7		
17	16	8	9		
18	17	0	3		
19	18	10	9		
20	19	9	9		
21	20	7	7		
22					
23	Average:	7.05	7.65		
24	Standard deviation:	2.178875857	1.620956508		
25	Covariance:		=covariance.p(B2:B21,C2:C21)		
26					
27					
28					

Note that, in all cases, we are looking for the covariance between the baseline results and the post-intervention time point in question. For example, the covariance relating to Time 2 is the covariance between the baseline results and the Time 2 results.

How does the Calculator calculate the cost-effectiveness ratio?

The Calculator starts by calculating the net cost of the intervention per participant (cell B55). This is derived from the total cost of the intervention (from either cell B46 where the total cost was provided directly or the sum of cells B20, B36 and B45) minus any productivity benefits (net of any productivity benefits also experienced by the control group, shown in cell B52) divided by the number of participants (cell B3).

$$Net\ cost\ per\ participant = \frac{Total\ cost - Productivity\ benefits}{Number\ of\ participants}$$

To calculate the wellbeing impact, the Calculator uses an approach called difference-in-difference. The net wellbeing impact at any point in time post-intervention (say Time 1) is equal to the difference between the average wellbeing of the participants at Time 1 (cell B60) and the average wellbeing of the participants at baseline (cell B59) minus the difference between the average wellbeing of the control group at Time 1 (cell B64) and the average wellbeing of the control group at baseline (cell B63).

$$Net\ wellbeing\ impact\ at\ Time\ 1 = (B60 - B59) - (B64 - B63)$$

If there is no control group, the Calculator effectively assumes that the counterfactual change in wellbeing (what would have taken place without the intervention) is zero, i.e. $B64 - B63 = 0$. Making this assumption risks overestimating the true impact of the intervention, which is why results from studies that do not use a control group should be treated with extreme caution.

The Calculator also estimates upper and lower bounds around the net wellbeing impact at each point in time. This is calculated using estimates of the sample size, standard deviation and covariance of the data. The exact formula used can be provided by the authors on request but in general confidence intervals are lower (i.e. results are more likely to be statistically significant) the higher the sample size, the lower the standard deviations and the higher the covariance.

This net wellbeing impact is then converted into life satisfaction units, using the exchange rates shown in the table. Again, the methods used to estimate these exchange rates can be provided by the authors on request. Some of our exchange rates are taken directly from Layard (2016).

As the data inputted into the Calculator provides only a snapshot of the wellbeing impact at a maximum of three points in time post-intervention, we need to make some assumptions about how wellbeing evolves over time between these data points. We make the assumption that the wellbeing effect starts from zero and then evolves in a straight line to net wellbeing impact (converted into life satisfaction) at Time 1. It then moves in a straight line between Time 1 and Time 2 and between Time 2 and Time 3. In other words, we assume that changes in wellbeing as a result of the intervention are gradual and constant. After the last

data point, wellbeing is assumed to flat-line from that point forward. In other words, the participants are assumed not to experience any further increases or drop off in wellbeing relative to the control group. This evolution is clear by looking at Chart 2 in the Calculator, once the data has been entered. The upper and lower bounds determined by the 95% confidence interval follow similar trajectories.

To find the net impact on life satisfaction per person in the first year, the Calculator calculates the area under the line and above the baseline (x-axis) bounded between 0 and 1 year (i.e. we assume no impact after one year from the start of the intervention). If the line goes below the baseline, then this is a negative impact. This figure is shown in cell B76, with the lower and upper bounds shown in cell C76 and D76 respectively.

The cost-effectiveness ratio (CER), shown in cell B71, is the ratio between the net cost per participant and the net impact on life satisfaction per person in the first year.

$$CER = \frac{Net\ cost\ per\ participant}{Net\ impact\ on\ life\ satisfaction\ per\ participant}$$

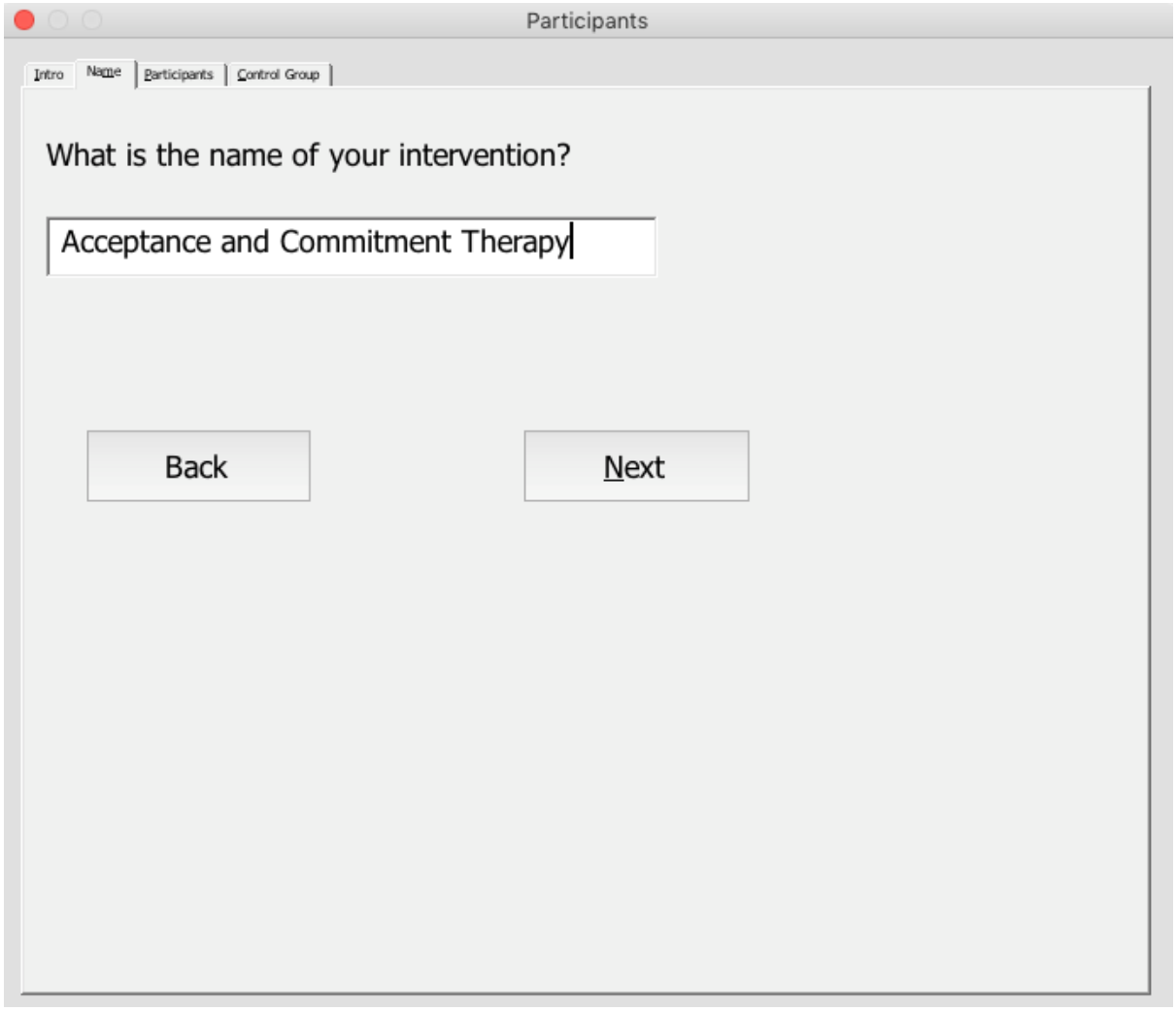
The cells B80 and B83 show how this cost-effectiveness changes if we assume that wellbeing impacts persist for two and three years respectively, where impacts beyond the first year are discounted at a rate of 1.5% per year. See Wright et al. (2017) for a discussion about discount rates.

Worked example

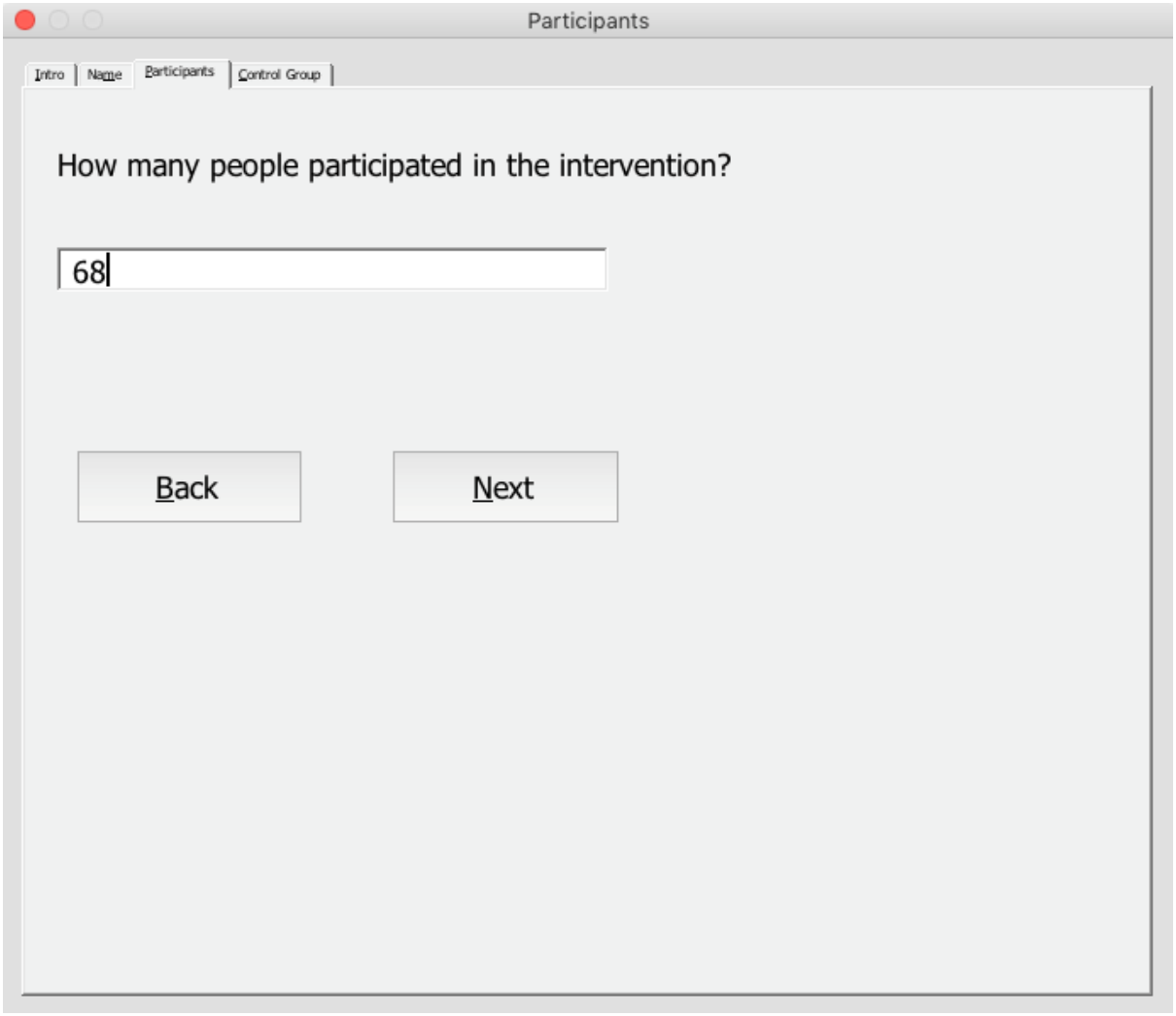
In this section, we present a worked example based on a study by Lloyd, Bond and Flaxman (2017). This study investigates the effect of a workplace Cognitive Behavioural Therapy on psychological flexibility and emotional burnout. A total of 153 UK government employees took part in the study, of which 68, which we will refer to as the *Participants*, received the therapy and 85, which we will refer to as the *Control Group*, did not receive the therapy. With this information, we are ready to fill in the Participant window in the Calculator.

The screenshots presented here are taken from the Excel for Mac version but PC users should see a very similar interface.

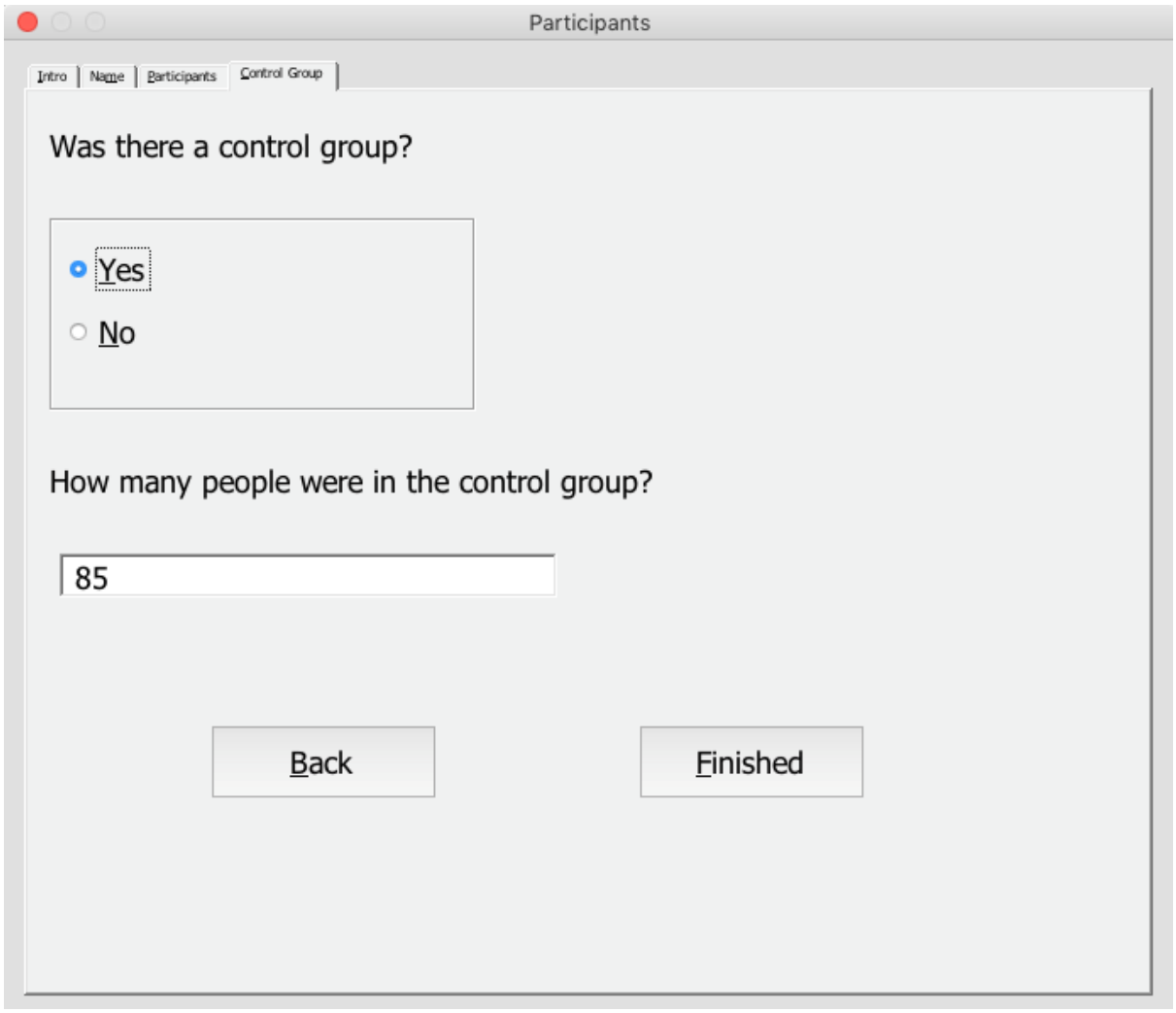
The first prompt requests the name of your intervention. In our example, the intervention is a Cognitive Behavioural Therapy (CBT) known as Acceptance and Commitment Therapy so we can use this as the name of the intervention.



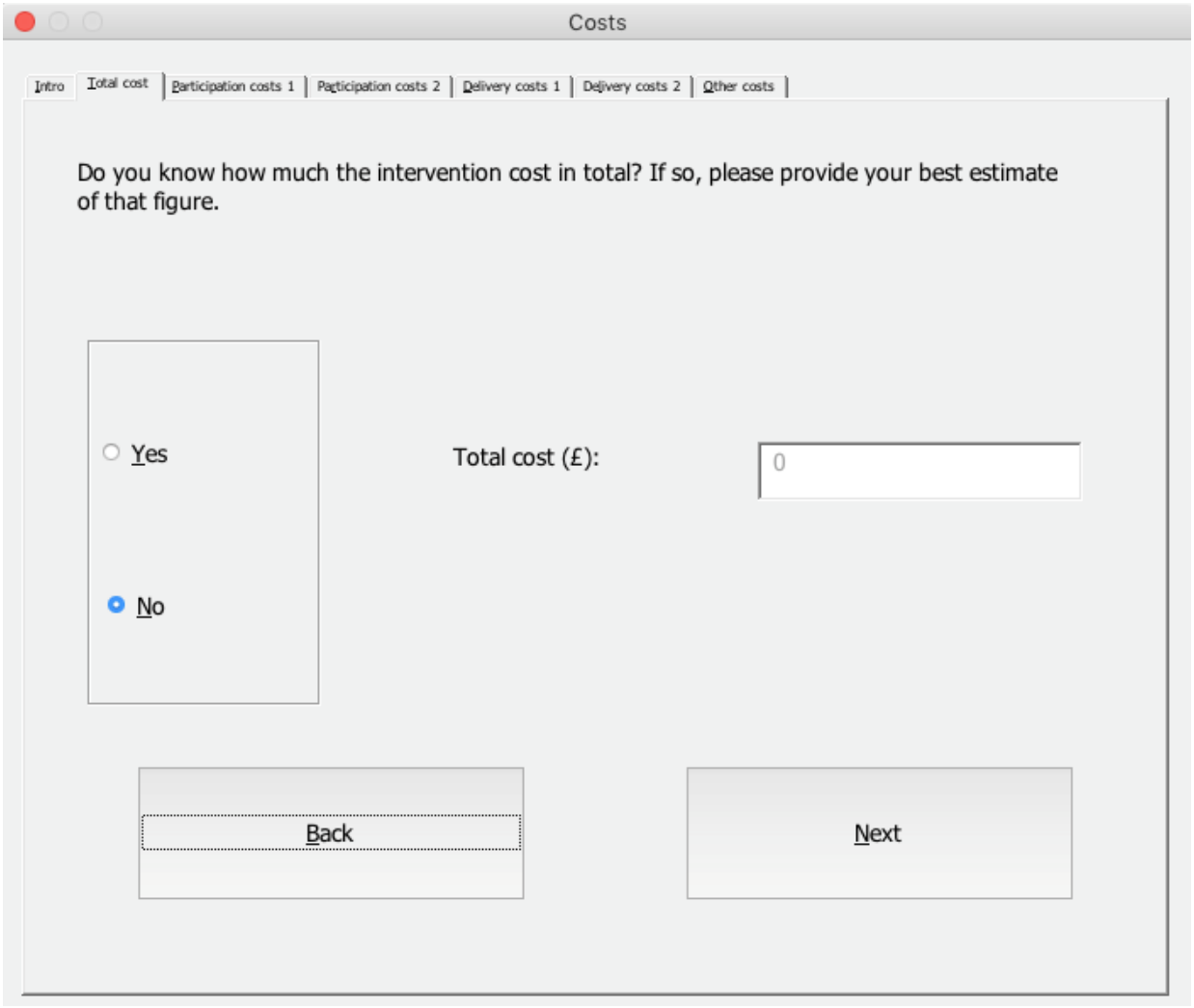
Once you have completed this and clicked the ***Next*** button, you will see a prompt which requires you to enter in the number of participants who received the intervention. In our example, 68 UK government employees received the training, so we enter in the value 68.



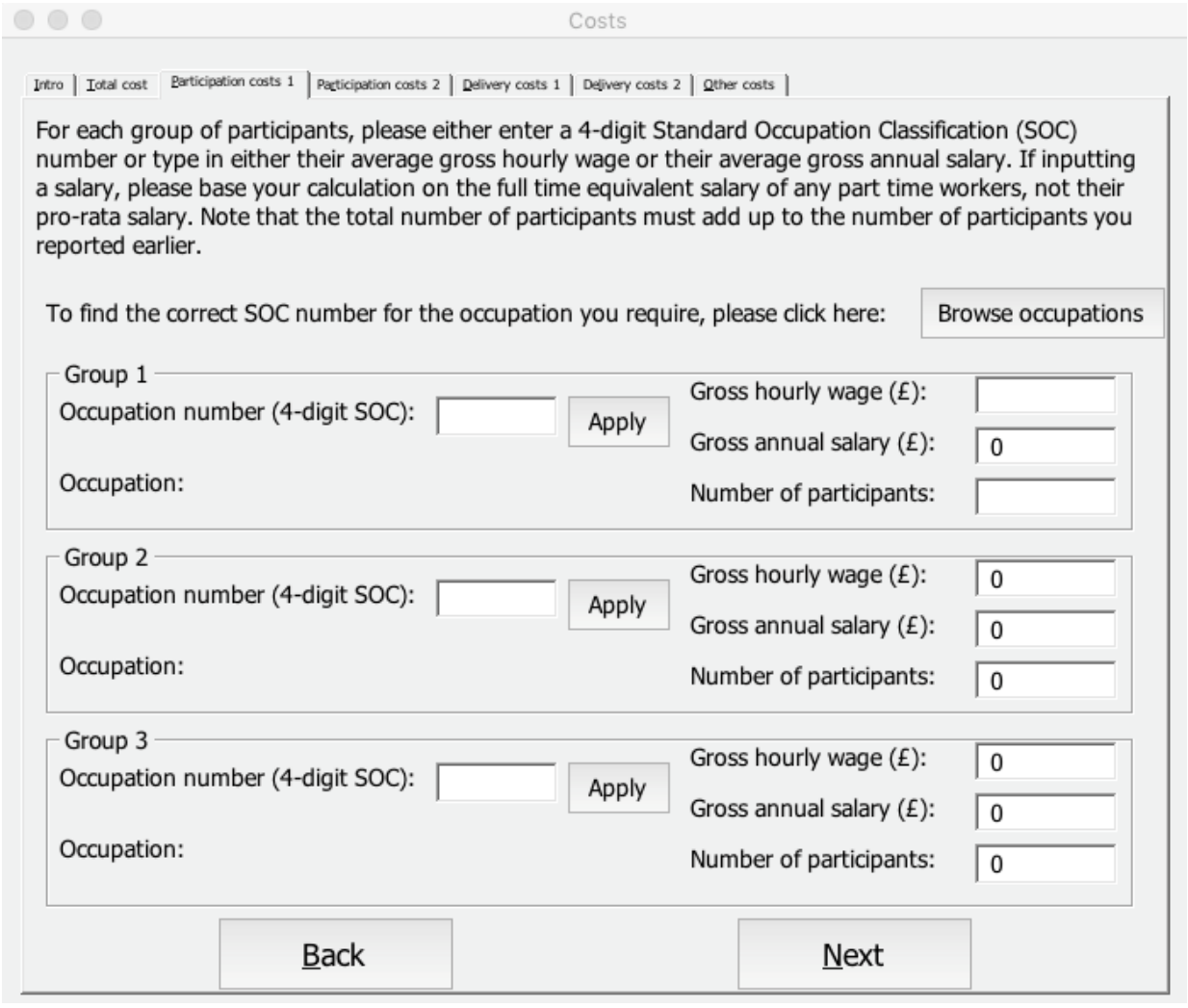
Following this, the next screen asks whether there was a *control group* (people who took part in the study but did not receive the intervention) and how many people there were in the control group. In our example, we have a control group which consists of 85 people who took part in the trial but did not receive the training.



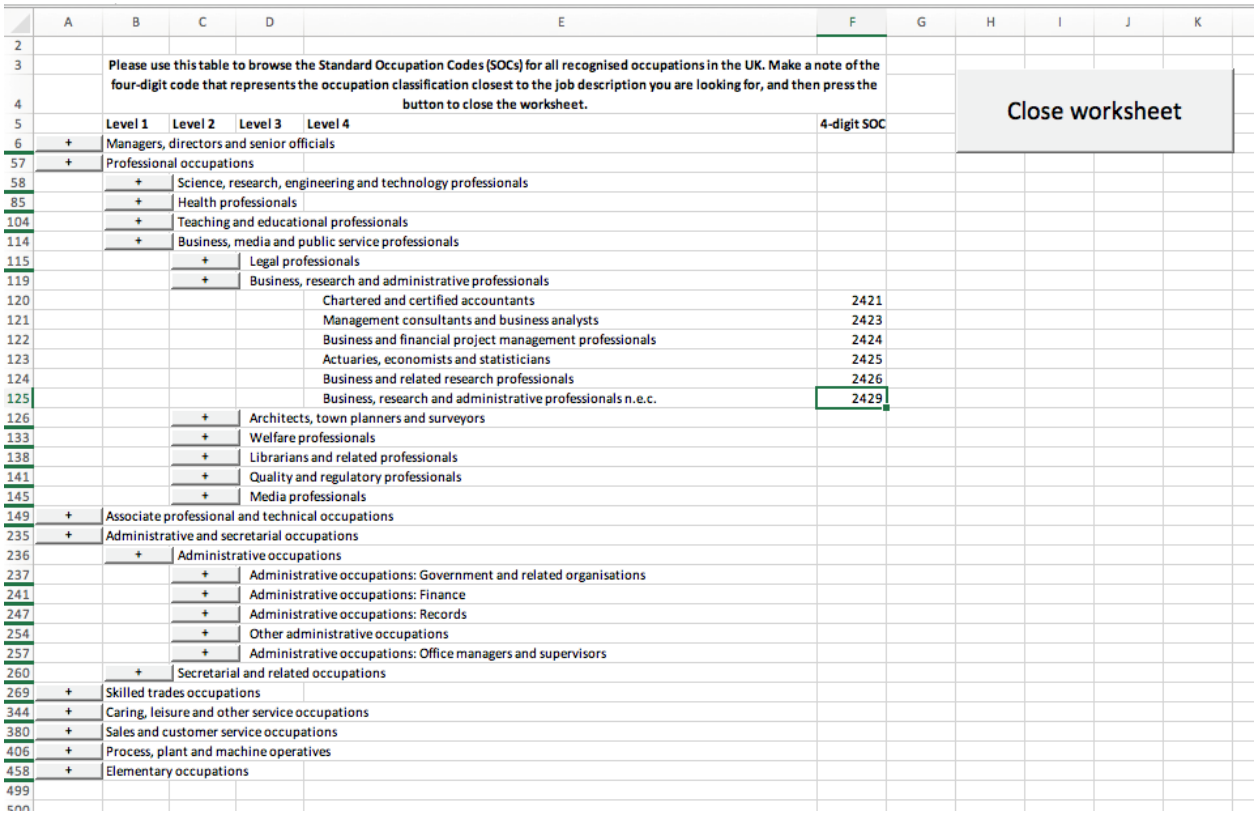
With this, we have completed the Participants window. Once we click the ***Finished*** button, we enter the Costs window of the Calculator. The first prompt we see in the Costs window asks whether or not we know the total cost of the intervention. In our example, the total cost of the intervention is not provided so we select ***No*** and click ***Next***.



We can work out the cost of our intervention by accounting for the time of those who participated in the intervention. In the screen below, we can see that participants can be split into up to three groups depending on their pay grade. This is to accommodate the possibility that the participants who received the training do not all belong to the same pay grade and thus have different values for their time. In our example, however, all our participants are UK government employees who we assume belong to the same pay grade so we need to use only one group: 'Group 1'.



We do not have information on how much UK government employees earn per hour but we can check this by clicking the ***Browse Occupations*** button. This takes us to a spreadsheet like the one below. The spreadsheet contains the Standard Occupation Codes (SOC) for all recognised occupations in the UK. Using the '+' buttons we can navigate to find the occupation that best fits the job description of the participants. In our example, within 'Business, media and public service professionals' we find the 4-digit SOC code for Business, research and administrative professionals which is 2429. We make a note of this number and click the ***Close worksheet*** button.

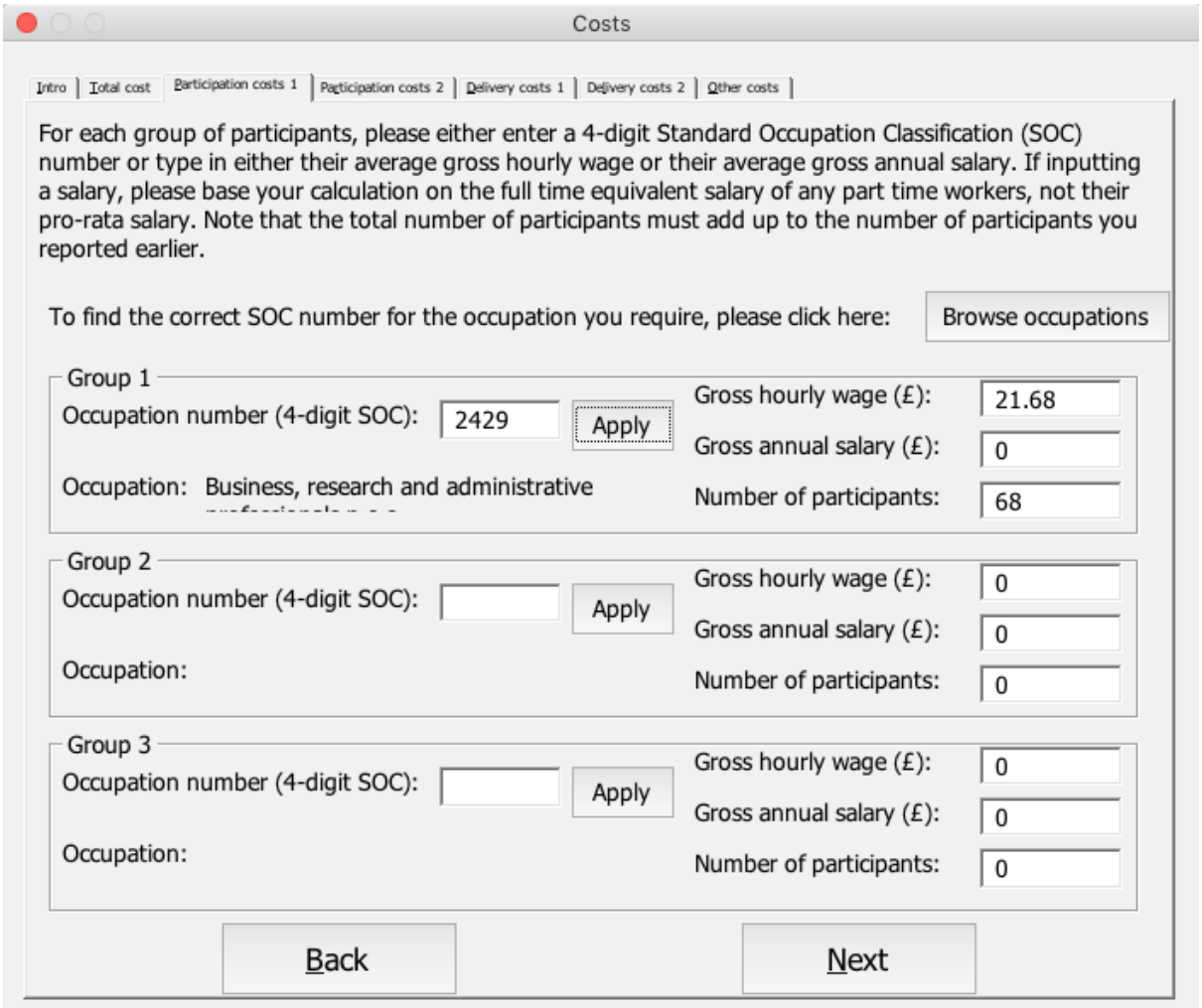


Please use this table to browse the Standard Occupation Codes (SOCs) for all recognised occupations in the UK. Make a note of the four-digit code that represents the occupation classification closest to the job description you are looking for, and then press the button to close the worksheet.

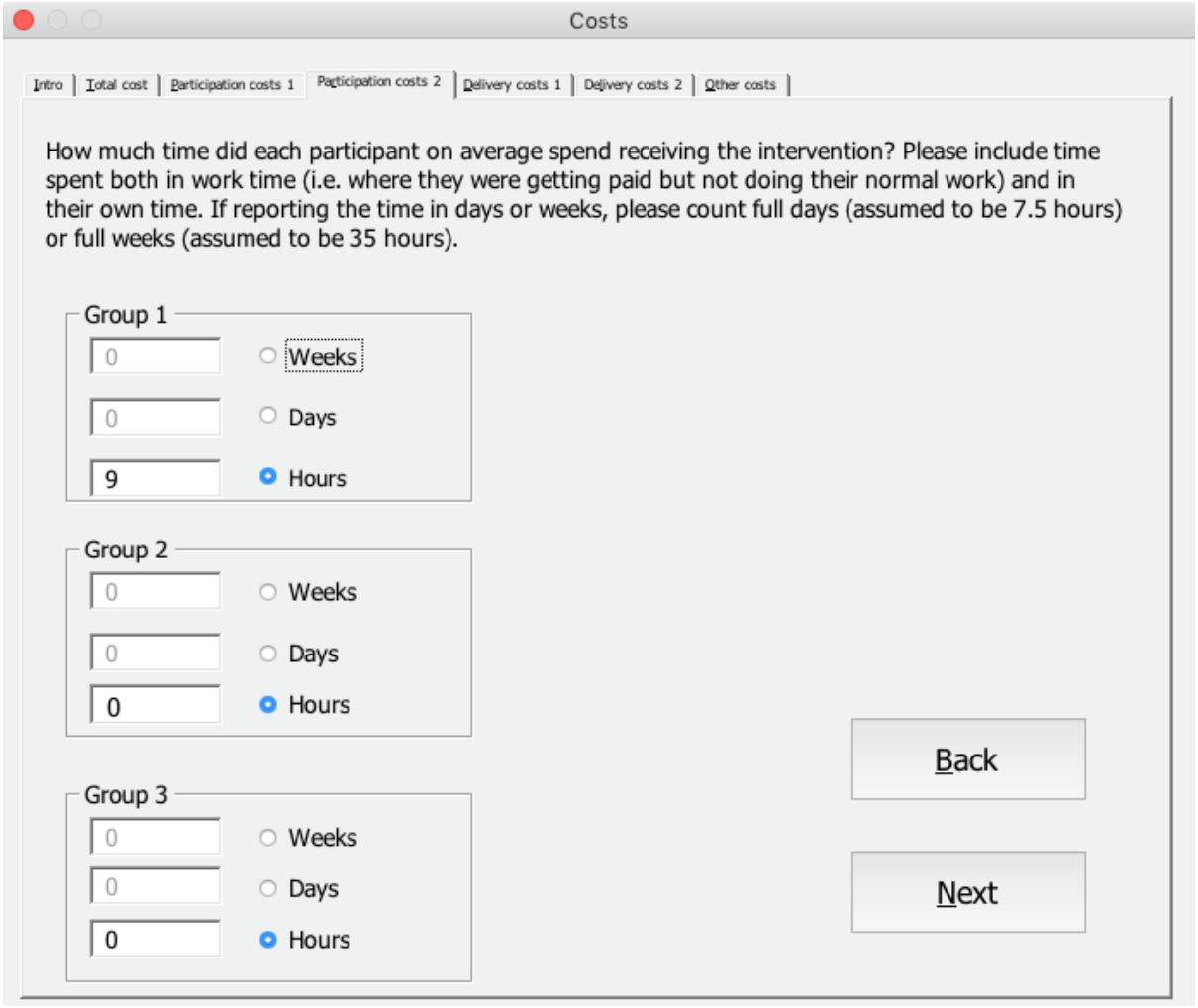
Close worksheet

Level 1	Level 2	Level 3	Level 4	4-digit SOC
+ Managers, directors and senior officials				
+ Professional occupations				
	+ Science, research, engineering and technology professionals			
	+ Health professionals			
	+ Teaching and educational professionals			
	+ Business, media and public service professionals			
		+ Legal professionals		
		+ Business, research and administrative professionals		
			Chartered and certified accountants	2421
			Management consultants and business analysts	2423
			Business and financial project management professionals	2424
			Actuaries, economists and statisticians	2425
			Business and related research professionals	2426
			Business, research and administrative professionals n.e.c.	2429
		+ Architects, town planners and surveyors		
		+ Welfare professionals		
		+ Librarians and related professionals		
		+ Quality and regulatory professionals		
		+ Media professionals		
+ Associate professional and technical occupations				
+ Administrative and secretarial occupations				
	+ Administrative occupations			
		+ Administrative occupations: Government and related organisations		
		+ Administrative occupations: Finance		
		+ Administrative occupations: Records		
		+ Other administrative occupations		
		+ Administrative occupations: Office managers and supervisors		
	+ Secretarial and related occupations			
+ Skilled trades occupations				
+ Caring, leisure and other service occupations				
+ Sales and customer service occupations				
+ Process, plant and machine operatives				
+ Elementary occupations				

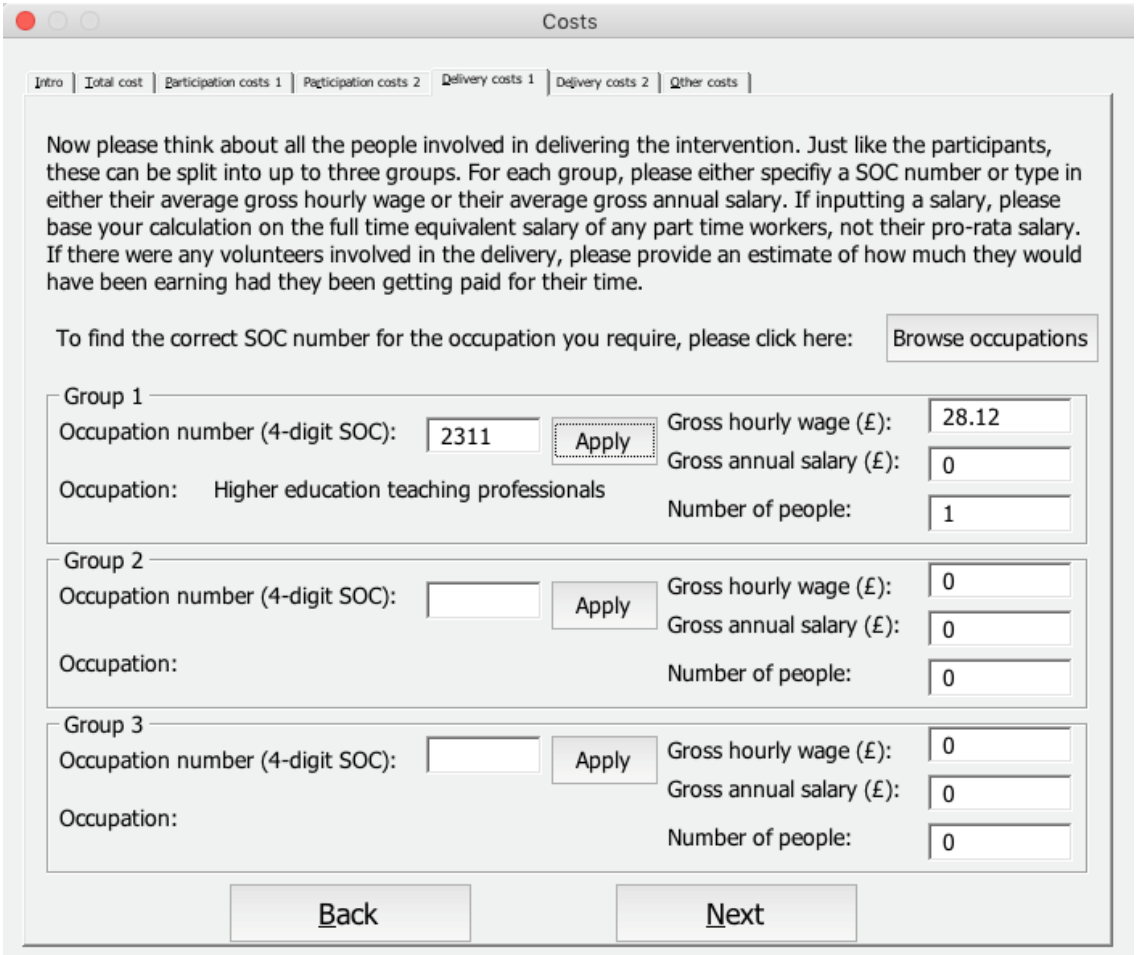
Once we have completed this step and we have our 4-digit SOC code to hand, we return to the Costs window where we input this 4-digit SOC code and click the ***Apply*** button. This automatically fills the 'Gross hourly wage (£)' cell with the appropriate figure (based on average hourly wages of people in this occupation in the UK). We then input the 'Number of Participants' and click the ***Next*** button.



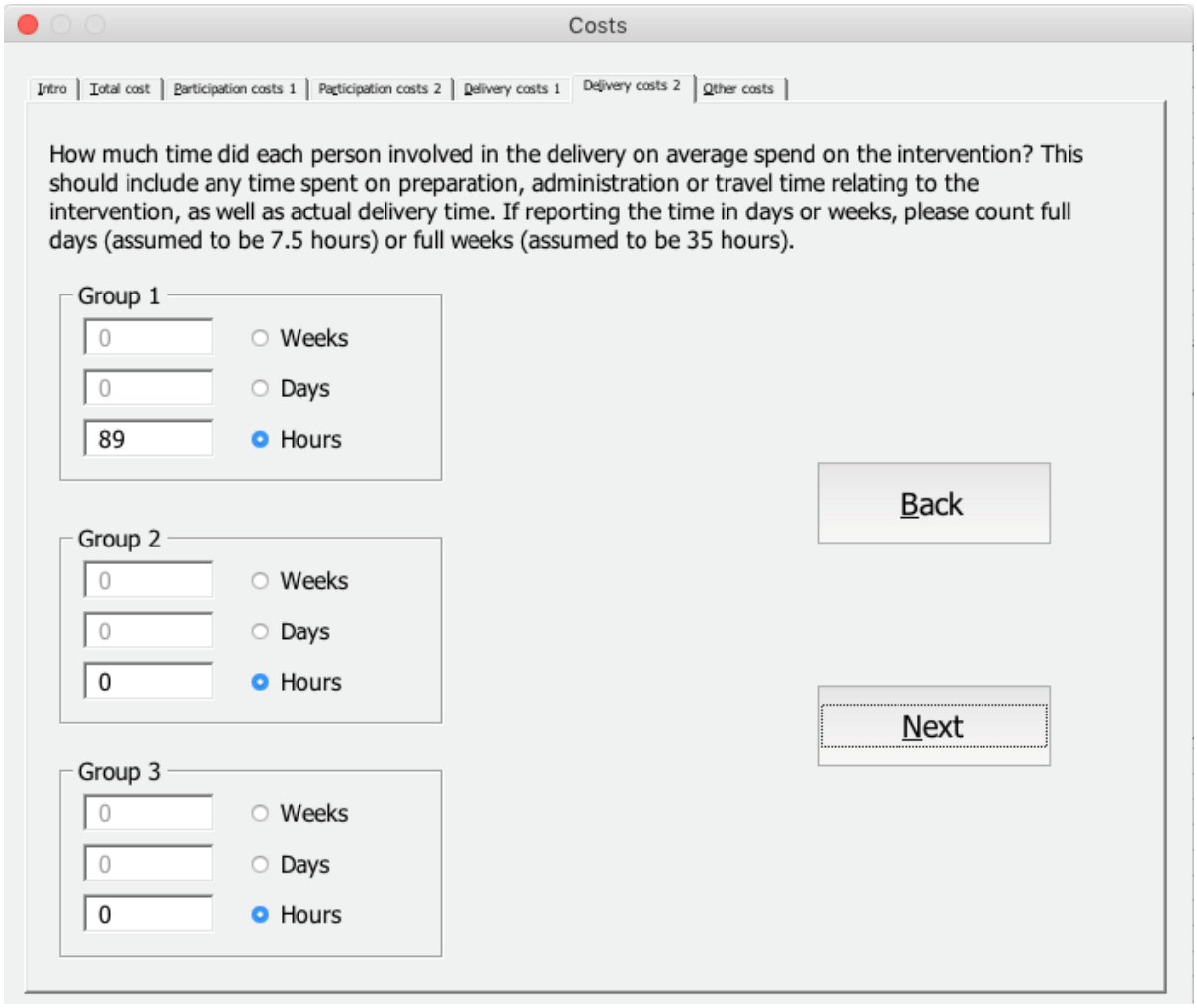
The following prompt requests information on how much time was spent by each group on the intervention. In our example, the participants (all in Group 1) each attended three three-hour sessions. Therefore, the total time spent on the intervention by each participant was 9 hours. We enter this value into the appropriate cell and click ***Next***.



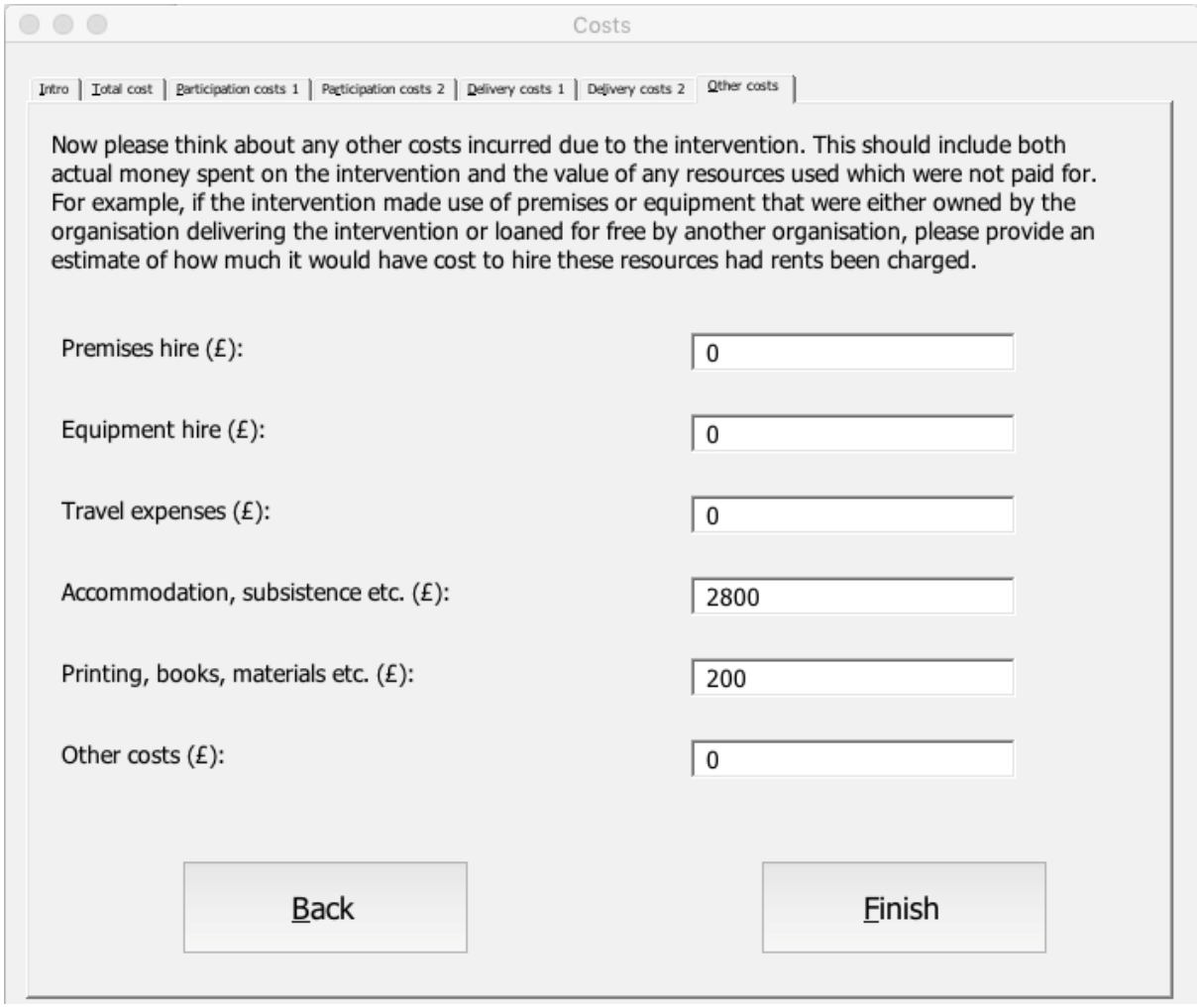
We click the ***Next*** button and move on to the 'Delivery costs' tab within the Costs window. Here we are required to account for the time spent delivering the intervention. In our example, the intervention was delivered by a facilitator who is a university researcher. To account for the facilitator's time, we can obtain the 4-digit SOC for Higher Education Teaching Professionals by clicking the ***Browse Occupations*** and making note of the appropriate code, 2311, from the spreadsheet. Once we have the code to hand, we can close the worksheet and return to apply the 4-digit SOC code. This automatically fills the 'Gross hourly wage (£)' cell with the value £28.12. Since we have just one facilitator in our example study, we enter the value 1 in the 'Number of people' cell.



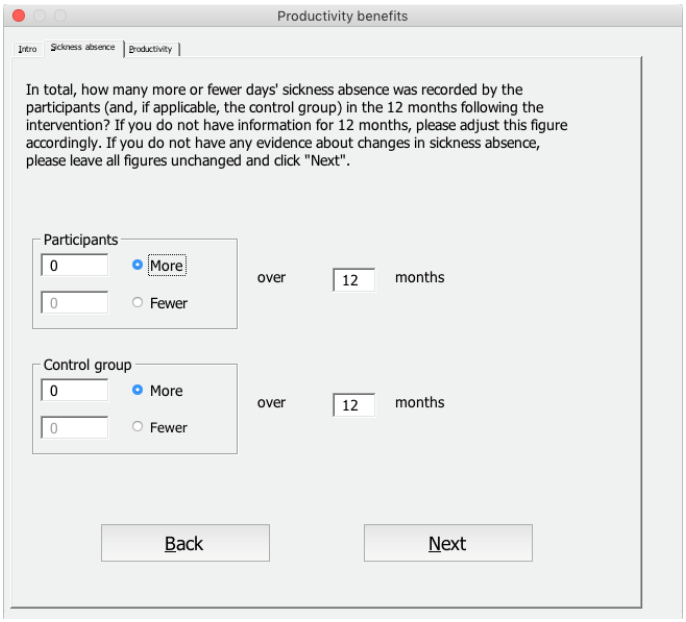
In our example, it is estimated that the facilitator spent a total of 89 hours on delivering the training. This includes 35 hours on using existing materials to develop the course plus time spent delivering the three three-hour sessions to all the participants in six groups (3x3x6=54).

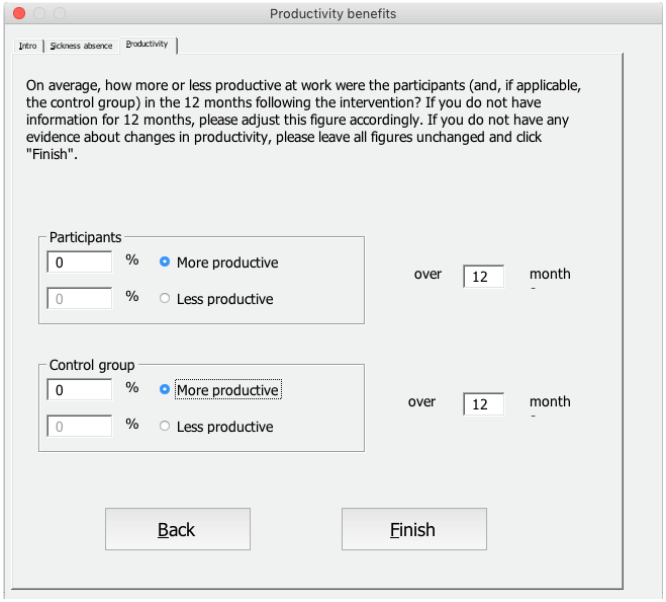

Costs
Intro
Total cost
Participation costs 1
Participation costs 2
Delivery costs 1
Delivery costs 2
Other costs
How much time did each person involved in the delivery on average spend on the intervention? This should include any time spent on preparation, administration or travel time relating to the intervention, as well as actual delivery time. If reporting the time in days or weeks, please count full days (assumed to be 7.5 hours) or full weeks (assumed to be 35 hours).
Group 1
0
Weeks
0
Days
89
Hours
Back
Group 2
0
Weeks
0
Days
0
Hours
Next
Group 3
0
Weeks
0
Days
0
Hours

We now move on to complete the 'other costs' section. In our example, it is estimated that £2800 was spent on accommodation and subsistence by the facilitator and £200 was spent on printing books and material for the intervention.



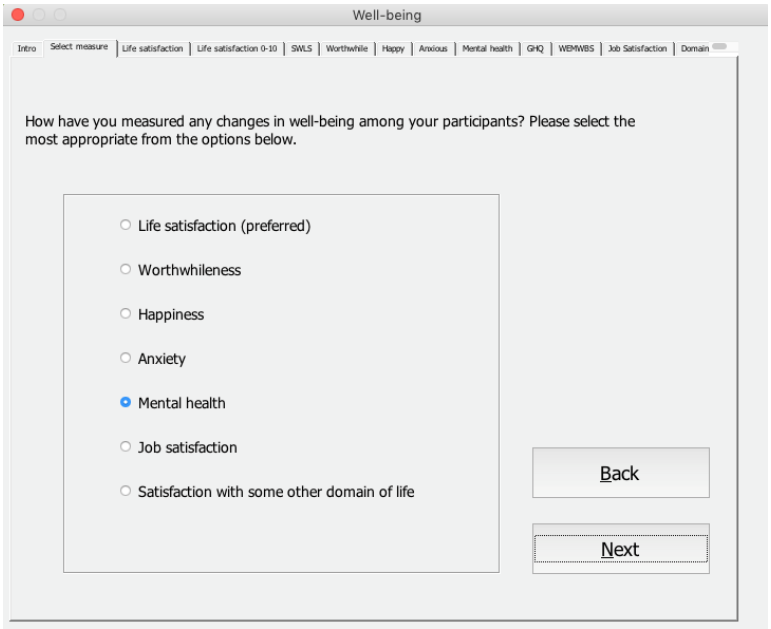
Once we have finished with the Costs section of the Calculator, we move on to the ‘Productivity Benefits’ window. In this section, if we recorded any productivity benefits from our intervention, we can input them here. Productivity benefits could be recorded via changes in sickness absence and changes in any other measure of productivity. However, if we do not have any measure for productivity, we can skip through this section.





In our example, no measure for productivity was recorded so we will skip this section and move on to the 'Wellbeing' section.

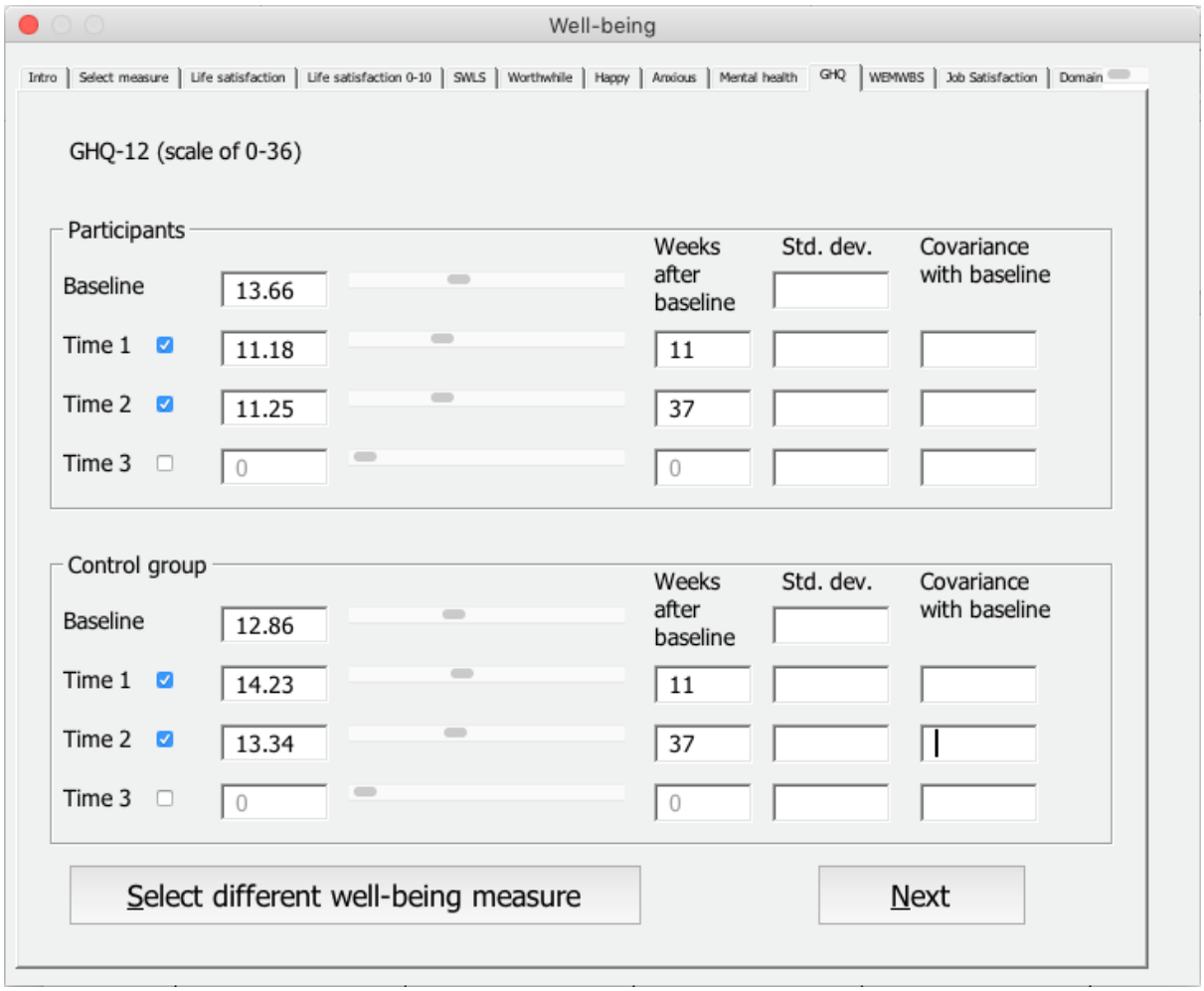
In the Wellbeing window, we begin by selecting the measure of wellbeing used in our study. In our example, the wellbeing measure is the GHQ-12 scale which was used in our example to measure the mental strain of participants. We make the appropriate selections as shown and click ***Next***.



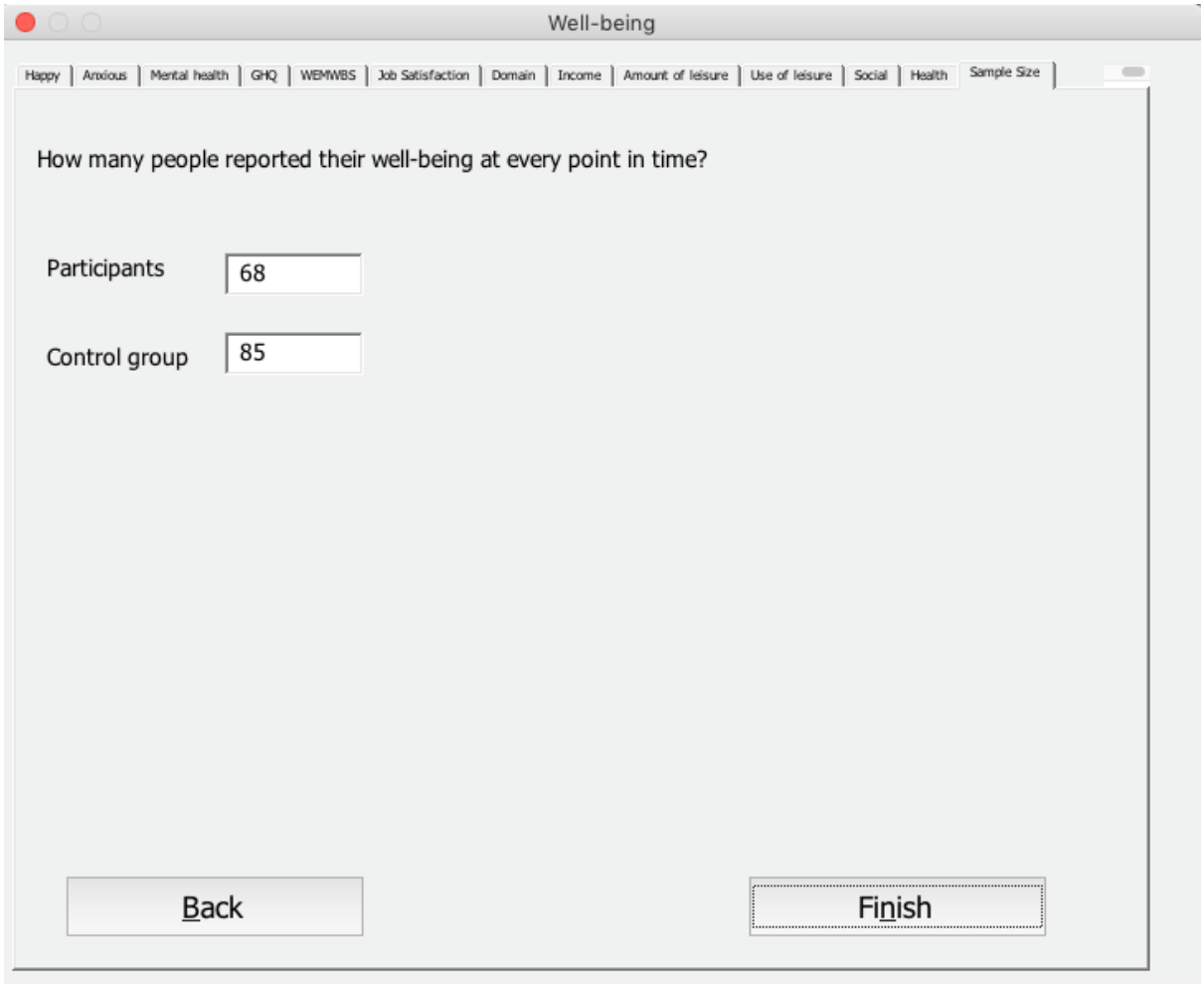
Having made the appropriate selection, we are taken to a screen which requires us to enter values of our wellbeing measure before the start of the intervention and at other times after the intervention has started. In our example, GHQ-12 before the start of the intervention was on average 13.66 for the participants and on average 12.86 for the control group. After the end of the intervention (week 11), GHQ-12 for the participants was an average of 11.18 and for the control group, an average of 14.23. Six months (follow-up period) after the end of the intervention (week 37), GHQ-12 for the participants was an average of 11.25 and for the

control group, an average of 13.34. Note that, on the GHQ-12 scale, higher numbers indicate higher mental strain and lower numbers indicate lower mental strain.

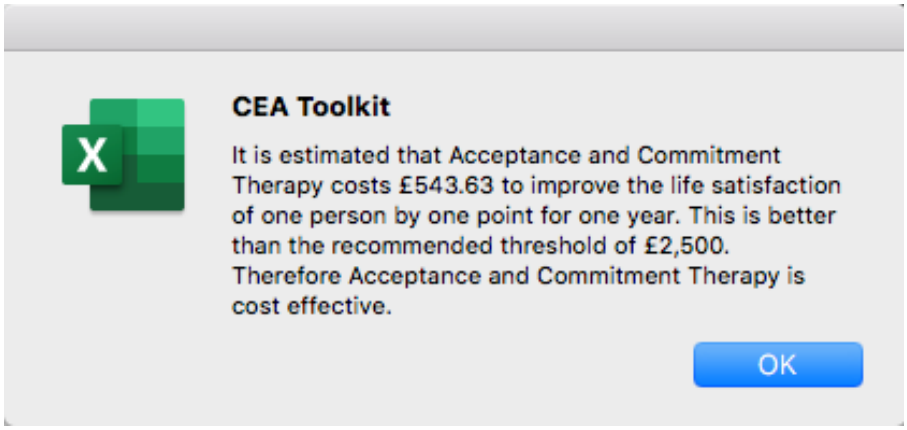
For the standard-deviation and the covariance values, if you have ***both*** values, then you can enter them accordingly. However, if you have just one or none of the values then you should ***leave both blank***. For our example, we do have values for the standard-deviation but we do not have values for the covariance, so we will leave all of these cells blank and click ***Next***.



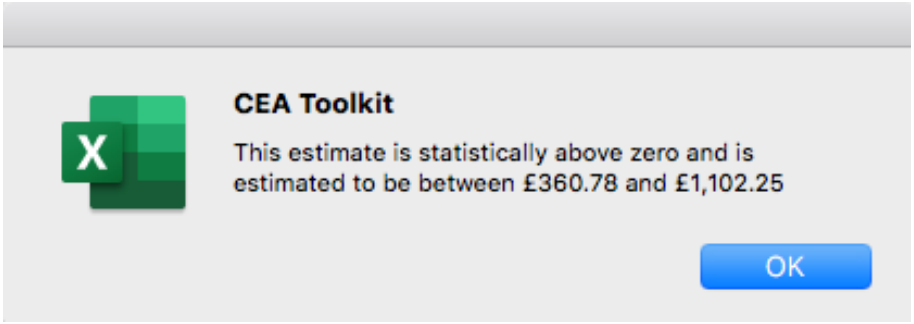
The following screen asks “How many people reported their wellbeing at each point in time?” This is to account for the eventuality that everyone who starts the intervention may not finish the intervention or may not report their wellbeing at all time points. In our example, however, everyone who started the intervention finished the intervention so we enter the values 68 for participants and 85 for control group.



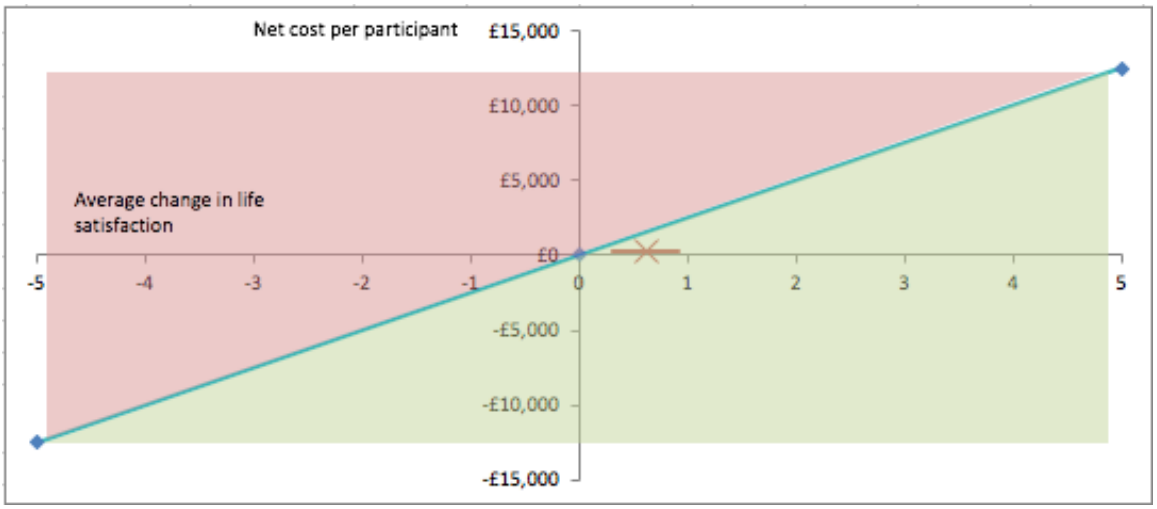
Once we have entered our values and clicked the ***Finish*** button, the Calculator generates a Cost Effectiveness Ratio (CER) which will be displayed in a dialogue box like the one below. The CER is the net cost of improving one person's life satisfaction by one point (on a 0-10 scale) for one year. In our example, the CER is £543.63. Interventions are assessed around a £2,500 threshold. Interventions with a CER less than £2,500 are considered value for money but interventions with a CER higher than £2,500 are not considered value for money.



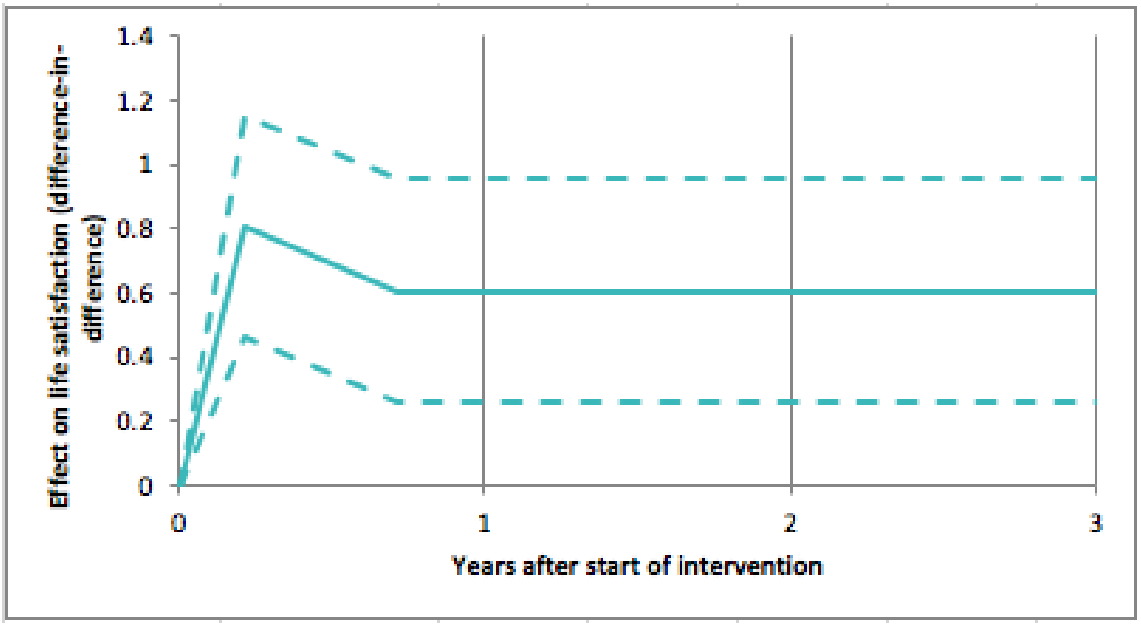
The next dialogue box shows us the confidence interval of our intervention. This is the highest possible estimated CER and the lowest possible estimated CER of the intervention with which we can be 95% confident. In our example, the highest possible estimated CER falls within the £2,500 threshold. This means that even in the worst-case scenario, the intervention is estimated to be cost-effective.



When we look back at the spreadsheet, we see that the Calculator has used our results to create two charts. These are easy to interpret. The first chart plots the net cost per participant against the average change in life satisfaction. In our example, we see that the red cross is in the green area, confirming that our CER is lower than £2,500. The red line showing the 95% confidence interval around our central CER is also fully in the green area. Therefore, we can be confident that the intervention is cost-effective.



The second chart shows the evolution of the wellbeing effect (in life satisfaction units) over time. We assume that there is zero impact at time 0. Our first post-intervention evaluation point is at 11 weeks where we see that the difference-in-difference (i.e. how much the participants' life satisfaction has increased relative to the control group, shown by the solid line) has gone up to about 0.8, and our second post intervention point is at 37 weeks where the difference-in-difference is evaluated at about 0.62. The area under the line represents the total effect on life satisfaction per person in each of the first three years. However, note that only the first year is used to estimate the main CER. The two dashed lines show the upper and lower confidence intervals around this central estimate.



References

All-Party Parliamentary Group on Wellbeing Economics, 2019. *A spending review to increase wellbeing: An open letter to the Chancellor.* APPG.

Ayres, J. and Malouff, J.M., 2007. Problem-solving training to help workers increase positive affect, job satisfaction, and life satisfaction. *European Journal of Work and Organizational Psychology*, 16(3):279-294.

Coulton, S., Clift, S., Skingley, A. and Rodriguez, J., 2015. Effectiveness and cost-effectiveness of community singing on mental health-related quality of life of older people: randomised control trial. *The British Journal of Psychiatry*. doi: 10.1192/bjp.bp.113.129908

Fitzhugh et al. 2019. Mindfulness in policing: randomized control trial of two online mindfulness resources across five forces in England and Wales. https://whatworks.college.police.uk/Research/Documents/Mindfulness_RCT_report.pdf

Layard, R., 2016. *Measuring wellbeing and cost-effectiveness analysis using subjective wellbeing*. What Works Centre for Wellbeing: Measuring wellbeing series, Discussion Paper 1.

Lloyd, J., Bond, F.W. and Flaxman, P.E., 2017. Work-related self-efficacy as a moderator of the impact of a worksite stress management training intervention: Intrinsic work motivation as a higher order condition of affect. *Journal of Occupational Health Psychology*, 22(1):115-127.

Oliver, J.J. and MacLeod, A.K., 2018. Working adults' well-being: An online self-help goal-based intervention. *Journal of Occupational and Organizational Psychology*, 91:665-680.

Wright, L., Peasgood, T. and MacLennan, S., 2017. *A guide to wellbeing economic evaluation*, What Works Centre for Wellbeing.