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# NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE (NICE)

## Workplace Health: Policies and Approaches To Support Employees With Disabilities and Long-Term Conditions: Economic Evaluation

## Final Report

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# Executive Summary

## 1. INTRODUCTION

The National Institute for Health and Care Excellence (NICE) has been asked by the Department of Health to produce guidance for employers and employees on approaches to support employees with disabilities and long-term conditions. This project will eventually form guidance that will be one of multiple workplace health based guidance recently issued, or in development, by NICE.

## 2. OBJECTIVES

The objective of the cost-effectiveness review and economic evaluation, as requested by NICE CPH, is to identify the following:

**1.** What are the costs and benefits to employers and employees of organisational and individual level interventions to support people with disabilities or long-term conditions to return to or stay in work?

**2.** Which interventions are most cost-effective, and for which conditions and occupational groups? What is the impact of timing, duration and intensity of the intervention?

The objectives specifically of the economic model are to:

- Develop an employer business case (cost-calculator) to answer question 1 for individual level interventions;
- Answer question 2 for individual level interventions using 'what-if?' analyses.

Organisational level interventions can also be modelled if the data are available.

## 3. METHODS

An economic model was developed to address the research questions. The model was developed as an interactive tool (a cost-calculator) to be made available to those at whom the guidance is aimed and who are considering implementing workplace interventions. The model allows the user to input values and generate results specific to their workforce. A basecase scenario was modelled in which inputs were derived from standard cost sources, effectiveness data and assumptions. Case studies are reported where data are available.

## 4. RESULTS

Results for the basecase showed that, based on the inputs included in the model, an intervention would be likely to be cost saving, provided that it provided sufficient benefits in at least one area (for example, productivity, absenteeism, staff retention). However, it is very difficult to generalise these results due to the variation in workplaces and interventions. Extensive sensitivity analysis, scenario analysis and case studies have been used to provide results that apply to a range or workplaces, interventions and population groups. In the majority of scenarios modelled, the workplace intervention resulted in cost savings. However, the results will differ when base case inputs are updated for individual companies and specific interventions.

## 5. DISCUSSION

The results of the model are difficult to generalise, since almost every input in the model will differ by specific organisation, sector and the nature of individual employees. Although definitive answers cannot be drawn, a flexible, user-friendly cost-calculator has been developed as a tool for decision-makers to input their own data tailored to an employer's workplace and specific intervention.

# Acknowledgements

The authors would like to thank the PHAC for their comments and suggestions.

# Abbreviations and Glossary

## ABBREVIATIONS

| | |
|---|---|
| CIPD | Chartered Institute of Personnel and Development |
| CPH | Centre for Public Health |
| CPI | Consumer price index |
| ICER | Incremental cost-effectiveness ratio |
| NHS | National Health Service |
| NICE | National Institute for Health and Care Excellence |
| ONS | Office for National Statistics |
| QALY(s) | Quality-adjusted life year(s) |
| QOL | Quality of life |

## GLOSSARY

| | |
|---|---|
| Absenteeism | Absence from work. |
| Incremental cost-effectiveness ratio (ICER) | The difference in mean costs in the population of interest divided by the differences in the mean outcomes in the population of interest. |
| Presenteeism | The practice of coming to work despite illness, injury or anxiety, often resulting in reduced productivity. |
| Productivity | A measure of the efficiency of a person. |
| Quality-adjusted life year | A measure of the state of health of a person or group in which the benefits, in terms of length of life, are adjusted to reflect the quality of life. One QALY is equal to 1 year of life in perfect health. |

# Section 1: Background

## 1.1 BACKGROUND

The National Institute for Health and Care Excellence (NICE) has been asked by the Department of Health to produce guidance for employers and employees on approaches to support employees with disabilities and long-term conditions. This project will eventually form guidance that will be one of multiple workplace health based guidance recently issued, or in development, by NICE:

In development:

- Workplace policy and management practices to improve the health and wellbeing of employees (NG13).

In addition, this guideline is likely to have some overlap with existing NICE guidance:

- Managing long-term sickness and incapacity for work (PH19);
- Promoting mental wellbeing at work (PH22);
- Workplace interventions to promote smoking cessation (PH5).

This guideline will cover employees who have a disability or long-term mental or physical health condition, (for example; asthma, cancer, Crohn's disease, dementia, depression, diabetes, hearing impairment, multiple sclerosis, obesity, osteoarthritis or sight impairment). People who are unemployed, self-employed or are under 16 are excluded from the scope of this project.

The interventions that will be assessed are those that aim to support employees to either stay in or return to work. The interventions must be aimed at employees but be the responsibility of the employer or be an organisational intervention. Due to the intervention, setting, stakeholders and conditions included in the scope of this guidance being wide, the guideline will consider factors such as size of organisation and the industrial sector.

The National Institute for Health and Care Excellence (NICE) Public Health and Social Care Centre (PHSCC)) has commissioned York Health Economics Consortium (YHEC) to carry out a systematic cost-effectiveness review and an economic model. The modelling approach has been based on an evaluation used to inform previous NICE public health guidance (Workplace Health – Older Employees). This document outlines the methods and results of the economic model.

## 1.2 OBJECTIVES

The objective of the cost-effectiveness review and economic evaluation is to identify the following:

**1.** What are the costs and benefits to employers and employees of organisational and individual level interventions to support people with disabilities or long-term conditions to return to or stay in work?

**2.** Which interventions are most cost-effective, and for which conditions and occupational groups? What is the impact of timing, duration and intensity of the intervention?

The objectives specifically of the economic model are to:

- Develop an employer business case (cost-calculator) to answer question 1 for individual level interventions;
- Answer question 2 for individual level interventions using 'what-if?' analyses.

Although organisational interventions can be modelled if the data are available, it is anticipated that the data necessary to populate the model are unlikely to exist.

Using costs and quality-adjusted life years (QALYs) to calculate incremental cost-effectiveness ratios (ICER) is the approach usually taken in economic evaluations for NICE (and is the approach outlined in the NICE Methods manual [1]), if the data are available for this type of analysis. This approach allows decision makers to decide if an intervention is an efficient allocation of National Health Service (NHS) resources. NICE currently uses an ICER threshold of £20,000 to £30,000, above which an intervention is not deemed to be an efficient use of NHS resources [1].

However, using QALYs as an outcome would not be relevant to most employers. From the employers' point of view, although the quality of life (QOL) of their employees may be important, QOL alone does not have a value in any sense that could be utilised by an employer. Increasing employees' QOL may, indirectly, increase productivity and thereby have some monetary benefits to the employer. However, this would be captured using costs alone, without QALYs. Furthermore, an ICER would not be suitable for decision-making as there is no commonly used threshold for an ICER in order for an intervention to be considered cost-effective from the perspective of an employer. Using QALYs can tell us about opportunity cost in the *healthcare system* so that we can quantify whether or not a new intervention will result in greater benefit than the intervention(s) that it displaces, but this is not of relevance to the employer. For these reasons, the approach taken is to develop an employer-focussed business case model which shows whether or not a specified intervention is cost-saving or cost-incurring from the employer perspective.

This document is structured as follows: Section 2 reports the methodology employed in developing the economic model including the inputs used in the model, Section 3 reports the model results and a discussion is included in Section 4.

This draft report has been put together before the systematic effectiveness review has been completed; therefore, although the model *structure* is in place, input parameters are likely to change. In addition, scenarios for specific interventions based on the literature are not yet included in the model, but these will be added when the effectiveness review results are available, pending the suitability of data.

# Section 2: Methodology

## 2.1 MODEL OVERVIEW

Figure 2.1 shows the structure of the cost-calculator model. The number of employees is included in the model and a per employee cost of intervention is assigned to each employee in the model cohort. For each category of cost saving in the model, the baseline rate, the cost of the outcome and the percentage reduction (or increase) is used to calculate the cost difference. The model compares implementing the workplace health intervention to 'no intervention'. No intervention represents what is currently done, which includes any legal requirements to make reasonable adjustments to the workplace for disabled employees [2].

The same calculations were applied to each of the categories. For example, the change in absenteeism (number of days on sick leave) was multiplied by the cost of a day of sick leave to give the cost difference before and after the intervention. The cost difference for all areas was summed to give an overall cost difference.

The categories of cost savings included in the model are:

- Absenteeism;
- Productivity;
- Staff turnover;
- Placeholders for the model user to add further outcomes.

Although there are countless areas of possible cost savings, the model was limited to up to five areas in order to make the results manageable and possible to interpret. The selected areas of cost savings are those that are most likely to have data available with which to populate the inputs with.

Because different interventions have different outcomes, the model allows the user to select which outcomes to include (such as, change in absenteeism, change in productivity and change in staff turnover). In addition, placeholders are included to add additional outcomes. This allows model users to include only those costs that are relevant to their organisation and to the intervention.

The model includes an option to select from a one year time horizon up to a five year time horizon. The model user can either:

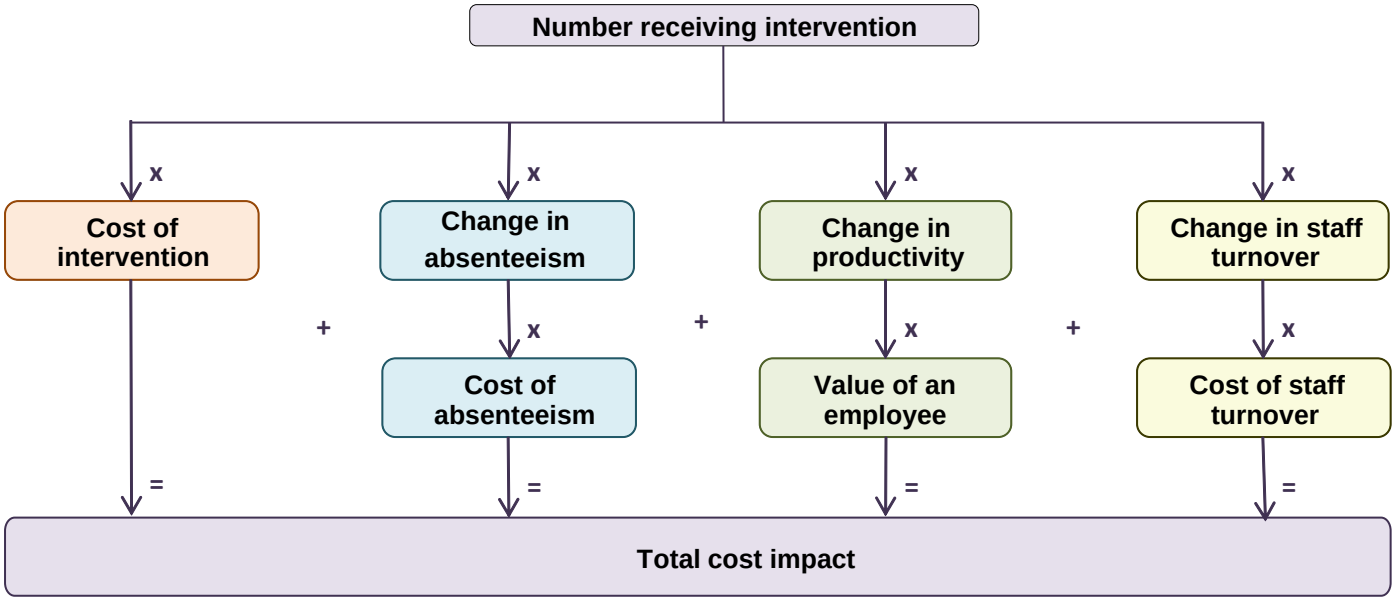
**1.** Input the same effectiveness each year. This applies the same effectiveness to in year one and all following years;

**2.** Choose a percentage reduction or increase that is applied to the effectiveness each year (to account for intervention effects becoming less pronounced over time. This is particularly relevant to one-off interventions);

**3.** Input the effectiveness inputs individually.

The longer time horizon may be included as a sensitivity analysis rather than in the base case. When a longer time horizon is selected the results are reported for each year separately and cumulatively. When a longer time horizon is selected, the costs are discounted appropriately.

**Figure 2.1: Model structure**




Note: A decrease in absenteeism and staff turnover is a positive change that would be a cost-saving while an increase in productivity is a positive change that would be a cost-saving.

## 2.2 MODEL PRESENTATION

The cost calculator is available on the NICE website. In order to make the model as user friendly as possible and to ensure that model users are clear about the caveats associated with input in the model and the benefits of adding inputs specific to their organisation, explanatory text has been added throughout the model.

Explanatory text outlining the caveats, instructions for use and a reminder to read the model report alongside using the model are included on the title sheet at which the model open at, as shown in Figure 2.2. In addition, guidance and reminders to enter the data relevant to each organisation is included in the comment box of each input cell, an example is shown in Figure 2.3.

**Figure 2.2: Model title sheet**

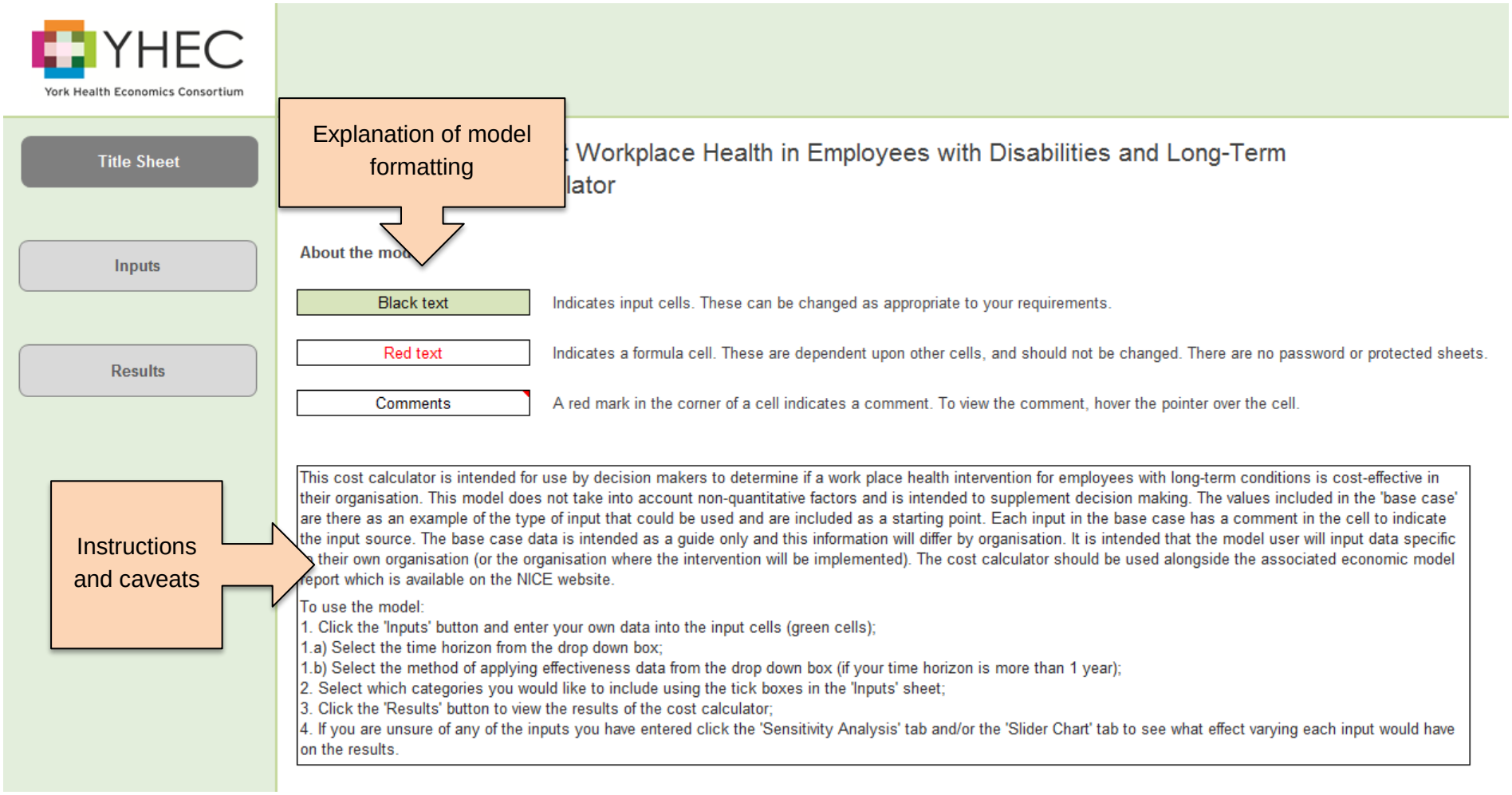
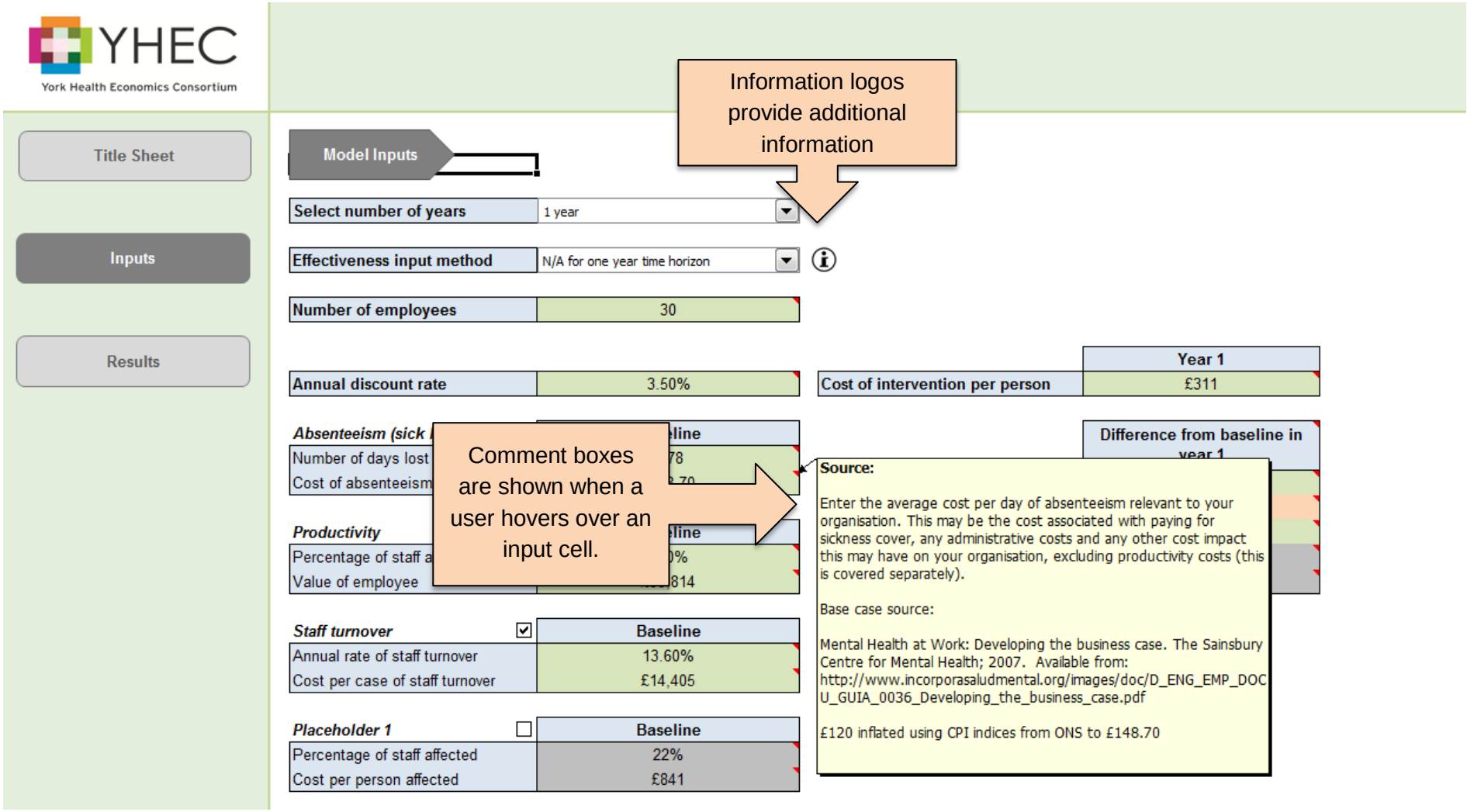


**Figure 2.3: Model input sheet**



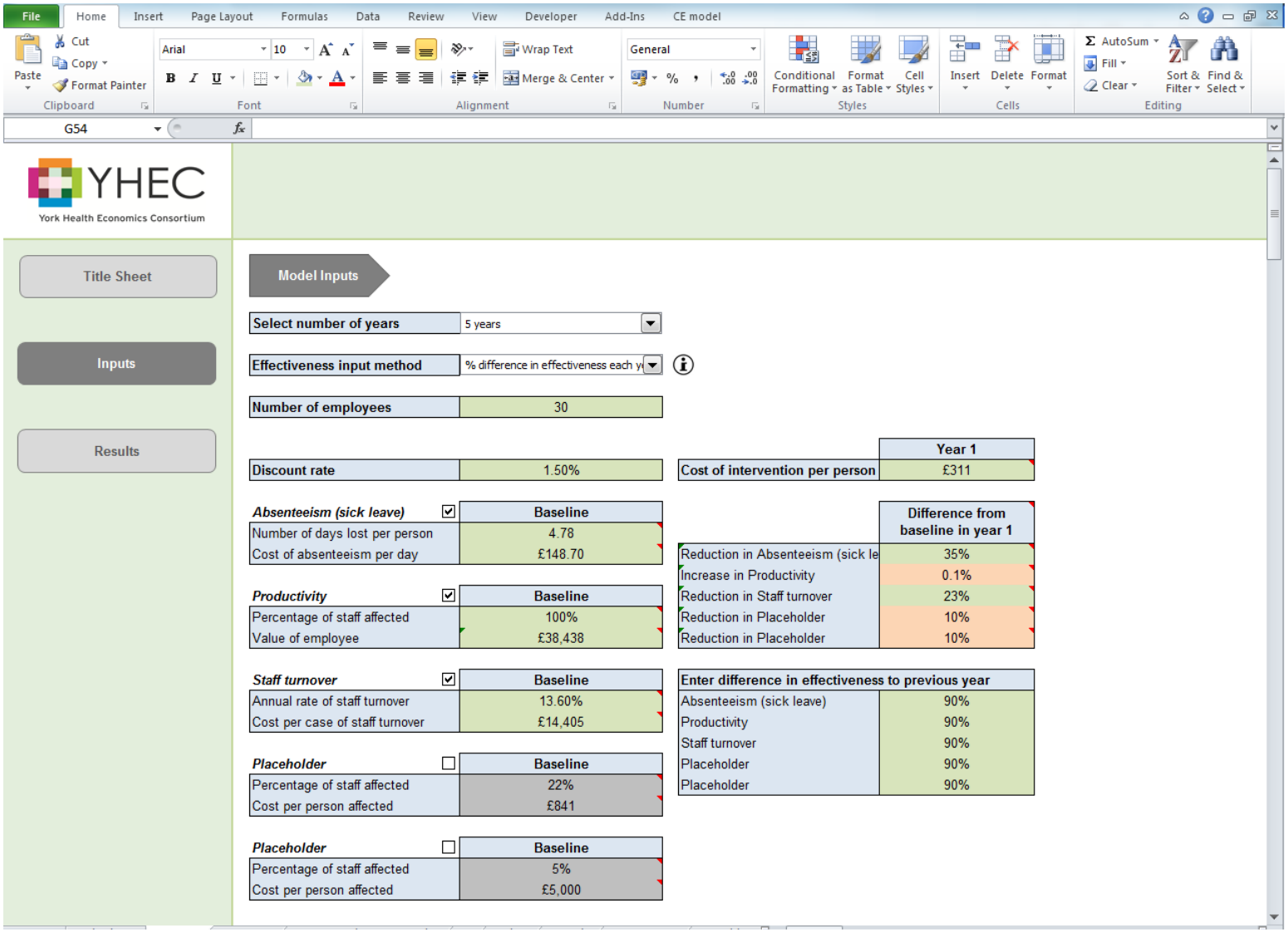
## 2.3 INPUTS

There are many factors that can affect the costs and effectiveness of a workplace health intervention. These include the type of chronic condition or disability the employee has, age, seniority of employees, the type of intervention, the type of organisation the intervention is carried out in and factors external to the workplace, such as the labour market, the current state of pension schemes, and personal financial and domestic situations. As defined in the NICE scope, there are a wide range of relevant interventions. It should be noted that an 'intervention' does not include any legal requirements to make reasonable adjustments to the workplace for disabled employees [2] because this should already be done in the workplace.

The best available inputs that have been identified to date are included and this can be used as a starting point for discussion. For the base case, average national-level input data are used. This allows key drivers and the likely direction of results to be identified.

Figure 2.4 summarises the base case inputs and ranges used in the model. It also shows how the model inputs sheet is laid out to allow the model user to select which of the five categories to include in the analysis (using tick boxes). The model user can also select the time horizon and the method of applying the effectiveness data from the drop-down boxes. The model user can input their own values in any of the green input cells and the model results will automatically update. It is recommended that model users input their own data. There are a number of caveats with the base case inputs (outlined in Section 2.1.1) and in addition, it is very likely that these inputs will differ by organisation and setting. The model includes two placeholders in which additional outcomes, which may be identified from the effectiveness review, can be added if necessary.

**Figure 2.4: Model inputs**



### 2.3.1 Basecase Inputs

The costs outlined below have been drawn from a review of national sources. The targeted review consisted of searching standard sources (such as ONS), a review of sources used in previous similar economic evaluations (both for NICE and in published economic evaluations) and targeted searches of the literature. However, it should be noted that many of the inputs are *general* inputs, representative of the overall population, rather than being specific to employees with disabilities and long-term conditions. The inputs included in the base case are *suggested* inputs. It is strongly recommended that model users input their own data as far as possible. If the model user does use some of the base case inputs it is important to note the caveat that the inputs are very likely to differ between organisation and setting.

#### 2.3.1.1 Cost of intervention

The intervention cost currently included in the model is taken from Squires *et al.* (2012) [3]. The paper reports the cost of usual care (£216) and the cost of the workplace health intervention (£527). The cost of the intervention is, therefore, included in the model as £311 (i.e. the *additional* cost). When individual case studies are modelled the intervention cost relevant to the case study intervention or population will be included. It is important to note that there are national schemes in place, such as the Access to Work Scheme [4]. Access to Work is a publicly funded employment support programme, one of its purposes is to give employees support in paying for workplace adjustments, and therefore, the employer may not bear the full cost of adjustments.

#### 2.3.1.2 Absenteeism

Absenteeism is defined as the number of days away from work due to sickness. The absenteeism parameters included in the model are outlined in Table 2.1. The number of days absenteeism for the general population may be different to the average for a population with a chronic condition or disability. It is assumed that absenteeism includes sick leave and disability leave in the model. Due to the basecase not including inputs related to a specific intervention, the national average number of sick days has been included.

**Table 2.1: Absenteeism parameters**

| Parameter | Input | Source | Notes |
|---|---|---|---|
| Number of days lost per person (baseline) | 4.78 | Office for National Statistics (ONS). Sickness Absence in the Labour Market. 2014 [5]<br><br>ONS. UK Labour Marker: Statistical Bulletin. 2015 [6] | ONS sickness absence rates weighted by the number employed aged 16 to 65 and 65+<br><br>Sickness absence rate applied to 253 working days |
| Cost of absenteeism per day | £148.70 | Mental Health at Work: Developing the business case. The Sainsbury Centre for Mental Health; 2007[7]<br><br>ONS consumer price index (CPI) indices | £120 from the Sainsbury report expressed in 2015 prices. The figure represented sickness absence costs across all health conditions. |

| | | | |
|---|---|---|---|
| Reduction in absenteeism | 35% | Building the case for wellness. 2008 [8]* | Analysis of 55 firms. Reduction in turnover ranged from 10% to 97% with the reported average around 30% to 40% |

* Workplace wellness includes health and safety, managing ill health and prevention and promotion.

#### 2.3.1.3 Productivity

Productivity is a measure of the efficiency of an employee. In the model, this has been included as the value that a staff member adds to an organisation. Productivity can be affected by many different things such as an employee's satisfaction in the workplace, the impact of other market forces and innovation. Although productivity is affected by other factors included in the model, such as turnover and absenteeism, the definition of productivity here is productivity *over and above* that which is already accounted for by absenteeism and staff turnover. When inputting productivity data into this model, the model user can either assume that the impact is for the whole organisation and give an average improvement or apply productivity as an impact on an individual (the parameters required for this are 'percentage of staff affected' and 'increase in productivity'). In the basecase the percentage of staff affected is 100% and this refers to those employees that have directly received an intervention. The increase in productivity refers to those that have received an intervention, rather than an increase in the whole workforce.

The productivity parameters included in the model are outlined in Table 2.2.

**Table 2.2: Productivity parameters**

| Parameter | Input | Source | Notes |
|---|---|---|---|
| Percentage of staff affected (baseline) | 100% | Assumption. Productivity affects 100% of staff because all staff have some level of productivity (which is assumed to be below 100% and could be improved) | Applies to all staff |
| Value of employee | £53,814 | ONS. Median full time gross weekly earnings. 2015 [9] plus 40% to represent on costs and an additional 40% to represent value to the company | 40% is added to gross earnings to represent the actual value to the company Estimate based on expert opinion. |
| Increase in productivity | 0.1% | Assumption | |

#### 2.3.1.4 Staff turnover

Staff (or employee) turnover is defined as the proportion of employees who leave a workplace over a set period of time (usually a year). There are several costs related to staff turnover, including legal fees, the cost of recruiting a new employee (costs of advertising and staff time), lost production while recruiting, training for a new employee, assisting employees to develop the level of skill needed for a new job role and the impact on others' productivity. It is recognised that there are different costs or turnover dependent on many factors, including the length of time an employees has been at a company.

The staff turnover parameters included in the model are outlined in Table 2.3.

**Table 2.3: Staff turnover parameters**

| Parameter | Input | Source | Notes |
|---|---|---|---|
| Annual rate of staff turnover (baseline) | 13.60% | CIPD, 2013 [10] | CIPD estimate of median rate of staff turnover. It is noted in the report that median figures do mask considerable differences between organisations |
| Cost per case of staff turnover | £14,405 | Mental Health at Work: Developing the business case. The Sainsbury Centre for Mental Health; 2007[7]<br><br>ONS CPI indices | The average cost to employers of a job change (across all reasons for staff turnover), including the cost of recruiting, selecting and training a replacement worker, is estimated at £11,625. Expressed in 2015 prices. |
| Reduction in staff turnover | 22.5% | Building the case for wellness. 2008 [8]* | Analysis of 55 firms. Reductions in staff turnover rates range from about 10% to 25%. On average, the reduction in staff turnover was around 20-25%. |

* Workplace wellness includes health and safety, managing ill health and prevention and promotion.

### 2.3.2 Case Studies

Hypothetical and real-world case studies are included in Section 3.7.

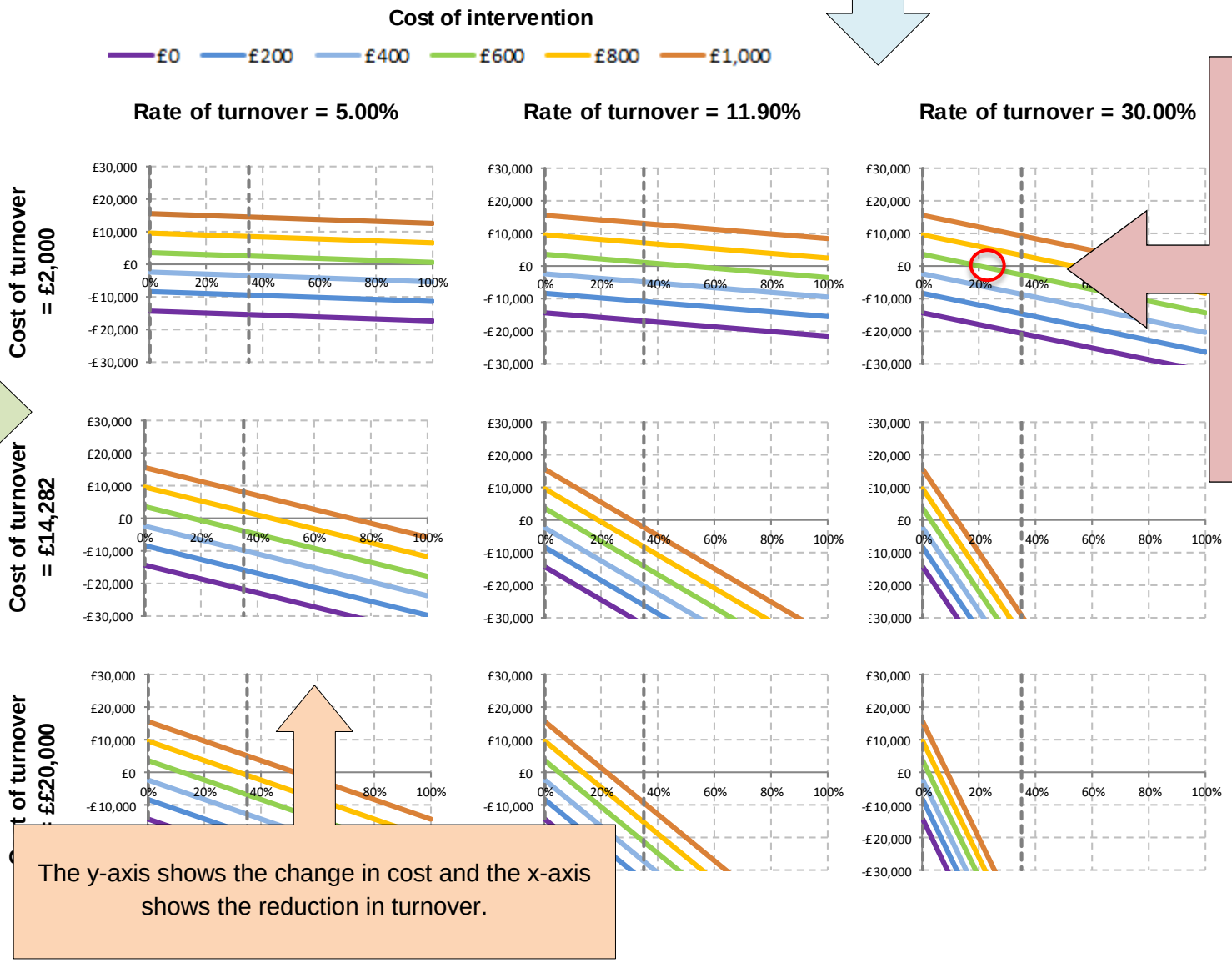
## 2.4 SENSITIVITY ANALYSIS

The model includes one-way sensitivity analyses of all key parameters. In addition, a scenario analysis is carried out to examine the impact of applying a difference discount rate. Four-way sensitivity analysis is also included. An explanation of how to interpret this is given in Figure 2.5.

A ‘slider chart’ in which the model user can change each parameter of the model individually and observe the impact that this has on the results is included in the model to allow stakeholders considering implementation of a workplace health intervention to view to impact relevant to their specific organisation. Figure 2.6 shows the layout of the slider chart.

**Figure 2.5: Example of four-way sensitivity analysis**

Rate of staff turnover can be read from left to right. As the rate of turnover increases, the effect of the reduction in turnover becomes more pronounced.

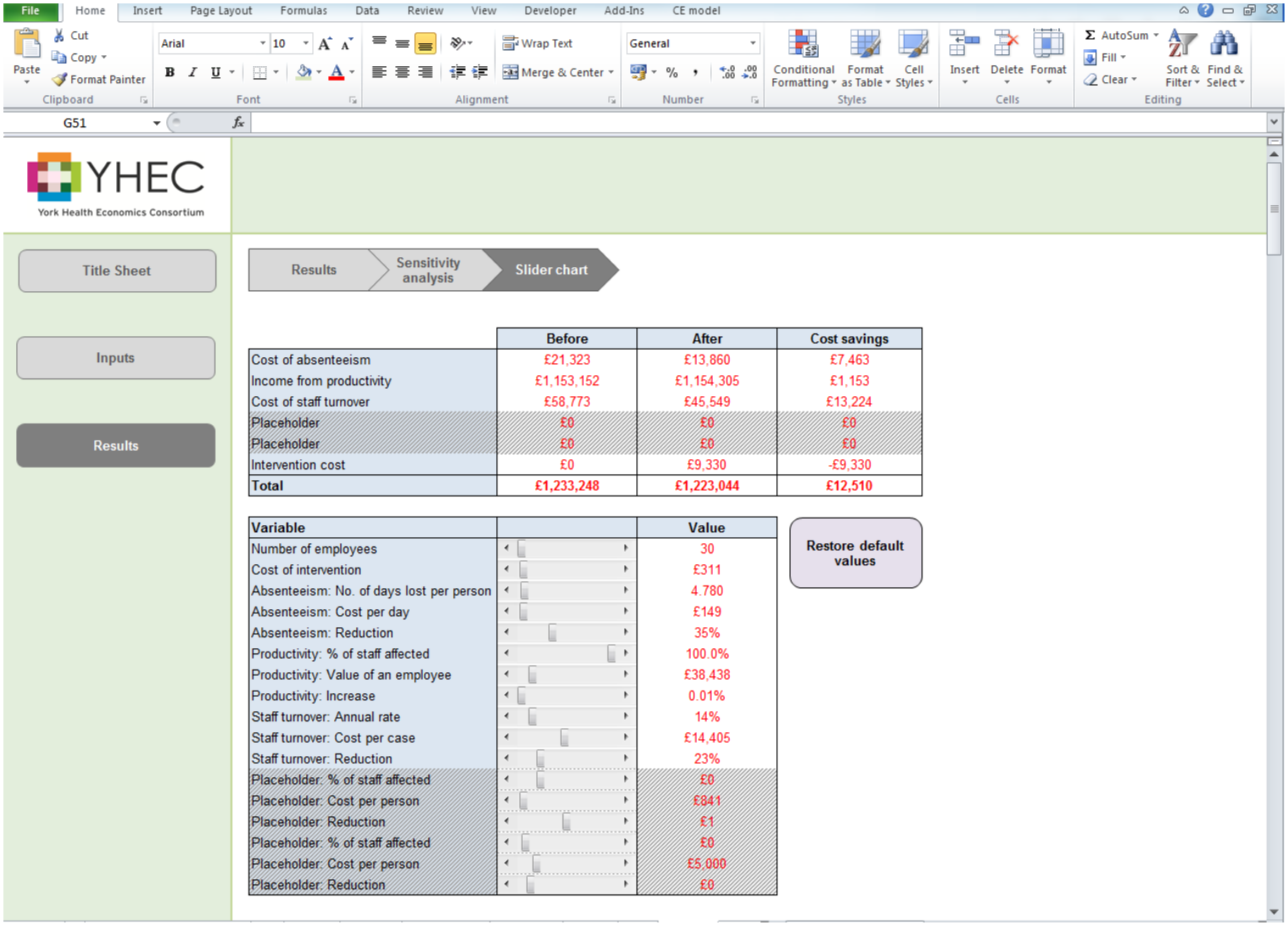



The cost of staff turnover can be read from top to bottom. As the cost increases, the effect of the reduction in turnover becomes more pronounced.

If the baseline rate of turnover is 30% and the cost of turnover is £2,000, an intervention costing £600 per person would need to reduce turnover by over 20% to result in cost savings.

The y-axis shows the change in cost and the x-axis shows the reduction in turnover.

**Figure 2.6: Slider chart**



# Section 3: Results

## 3.1 BASECASE INPUTS

The following values are used in the base case model (these are described in detail in Section 2.2):

- Intervention cost – £311 (applied in first year);
- Number of employees in model – 30;
- Absenteeism – days lost = 4.78, cost per day = £148.70, reduction = 35%;
- Productivity – staff affected =100%, value of staff member = £38,438, increase = 0.1%;
- Staff turnover – annual rate = 13.60%, cost per case = £14,405, reduction = 23%;
- Time horizon: Variable (stated in tables).

## 3.2 BASECASE RESULTS

Table 3.1 below shows the results for the base case model.

**Table 3.1: Basecase results (time horizon: 1 year)**

| | No intervention | Intervention | Incremental cost |
|---|---|---|---|
| Cost of absenteeism | £21,323 | £13,860 | -£7,463 |
| Income from productivity | £1,614,413 | £1,616,027 | -£1,614 |
| Cost of staff turnover | £58,773 | £45,549 | -£13,224 |
| Intervention cost | £0 | £9,330 | £9,330 |
| **Total** | **£1,694,509** | **£1,684,766** | **-£12,971** |

The results in Table 3.1 show that, with the current base case inputs, an intervention would be cost-saving. However, due to the uncertainty in the base case inputs it is important to note that these results will not apply to every organisation or intervention because each organisation will have different base case inputs and different levels of effectiveness.

Figure 3.1 shows a cost chart of Table 3.1. This illustrates the cost savings associated with each category (left hand bar) offset against the cost of the intervention (right hand bar). Based on the inputs in the base case, this allows the key drivers of the cost savings to be identified.

**Figure 3.1: Cost chart – base case results**

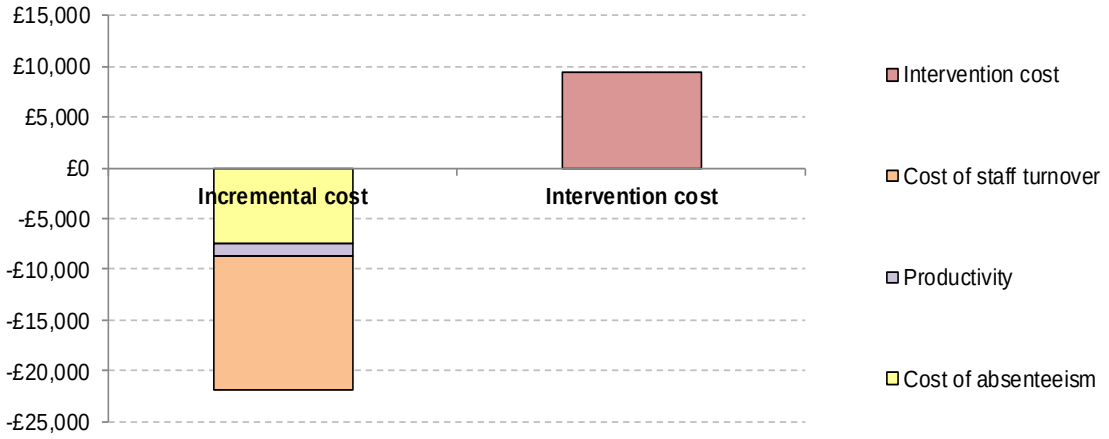



Figure 3.1 shows that in the basecase scenario, the reduction in staff turnover has the biggest impact on cost savings. This is due to the relatively high reduction in turnover that is applied after implementation of the workplace intervention and the high cost per case of turnover.

## 3.3 BASECASE RESULTS BY TIME HORIZON

- Intervention cost is applied once in year one;
- Effectiveness is assumed equal each year.

**Table 3.2: Cumulative discounted costs over 5 years**

| | No intervention | Intervention | Incremental cost |
|---|---|---|---|
| Year 1 | £1,694,509 | £1,684,766 | -£12,971 |
| Year 2 | £3,331,716 | £3,303,546 | -£34,519 |
| Year 3 | £4,913,558 | £4,867,583 | -£55,338 |
| Year 4 | £6,441,908 | £6,378,731 | -£75,452 |
| Year 5 | £7,918,575 | £7,838,777 | -£94,887 |

- Intervention cost is applied once in year one;
- 90% reduction in effectiveness to previous year.

**Table 3.3: Cumulative discounted costs over 5 years**

| | No intervention | Intervention | Incremental cost |
|---|---|---|---|
| Year 1 | £1,694,509 | £1,684,766 | -£12,971 |
| Year 2 | £3,331,716 | £3,305,388 | -£32,364 |
| Year 3 | £4,913,558 | £4,872,809 | -£49,227 |
| Year 4 | £6,441,908 | £6,388,619 | -£63,891 |
| Year 5 | £7,918,575 | £7,854,380 | -£76,642 |

## 3.4 FOUR-WAY SENSITIVITY ANALYSIS

Figure 3.2 to Figure 3.4 show four-way sensitivity analysis for each category within the model. . In the absence of specific data with which to populate the model, national-level inputs have been included. The four-way sensitivity analysis figures show the results when these key variables are changed. This allows the model user to identify which areas are most relevant to the scenario they are exploring. For example, it may be that some baseline characteristics differ when focused on a specific long-term condition compared to the national average, such as days of sick leave.

## 3.5 BREAK-EVEN ANALYSIS

The results of the four-way sensitivity analysis are also presented as a breakeven analysis in which the effectiveness of the intervention in order to breakeven is identified. The information in this analysis is the same as in the graphical diagrams but is presented slightly differently.

**Figure 3.2: Four-way threshold analysis – Absenteeism**

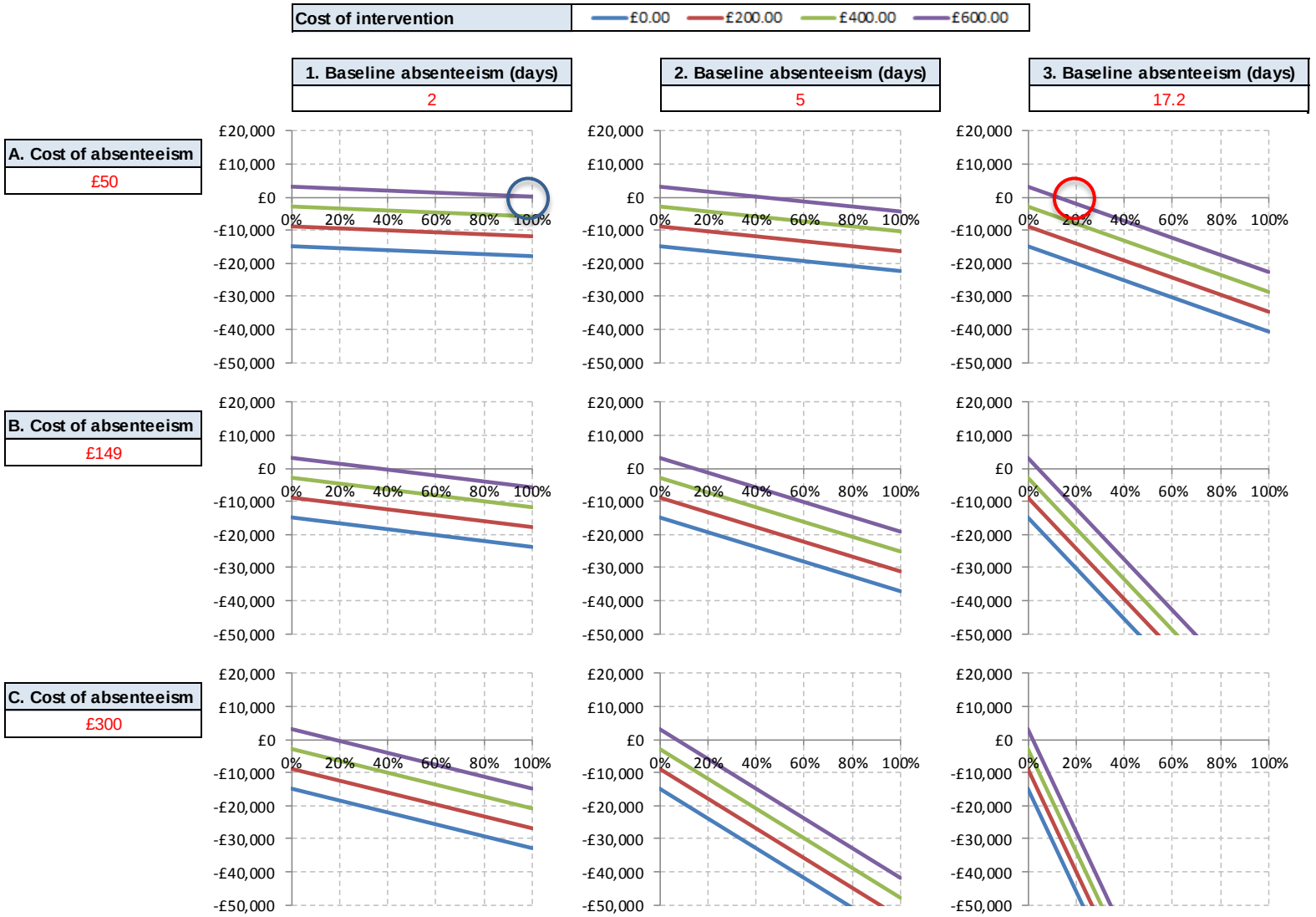


Figure 3.2 shows that the higher the baseline rate of absenteeism, the more capacity to benefit there is. When the extreme example of a baseline number of 17.2 sick days is taken (which is reported to be the number of sick days taken on average per year by people with heart failure [11]), even an intervention priced at £600 per person could save costs if it reduced absenteeism by 20% (red circle on Figure 3.2). Conversely, if the baseline absenteeism is only 2 days, an intervention that priced at £600 will never be cost saving, even if it is very effective (blue circle on Figure 3.2). This type of threshold analysis could help a stakeholder make the decision as to whether to implement an intervention to reduce absenteeism. If the workforce (or a specific group with long-term conditions within the workforce) already has a low rate of absenteeism (2 days) the stakeholder can be reasonably certain that an intervention priced at £600 is unlikely to result in cost-savings. A similar effect applies with the cost of absenteeism, as the costs increase, there is more capacity to benefit and the savings that can be achieved are more pronounced. Figure 3.2 shows the effect when only absenteeism is varied. These results are also presented in an alternative format in Appendix A. All other factors are held constant as described in the base case. This graph would, therefore, look different if other input parameters within the model change.

**Figure 3.3: Four-way threshold analysis – Productivity**

The results in Figure 3.3 follow the same pattern as the results in Figure 3.2. These results are also presented in an alternative format in Appendix A. This shows that when the productivity of people receiving the intervention increases, the cost savings to the company increases. In the base case, the improvement in productivity was estimated to be 0.1%. In this analysis the improvement is varied up to 20% - at this level, even with a lower value of employee and 50% of people affected, the cost savings to the company are high.

**Figure 3.4: Four-way threshold analysis – Staff turnover**

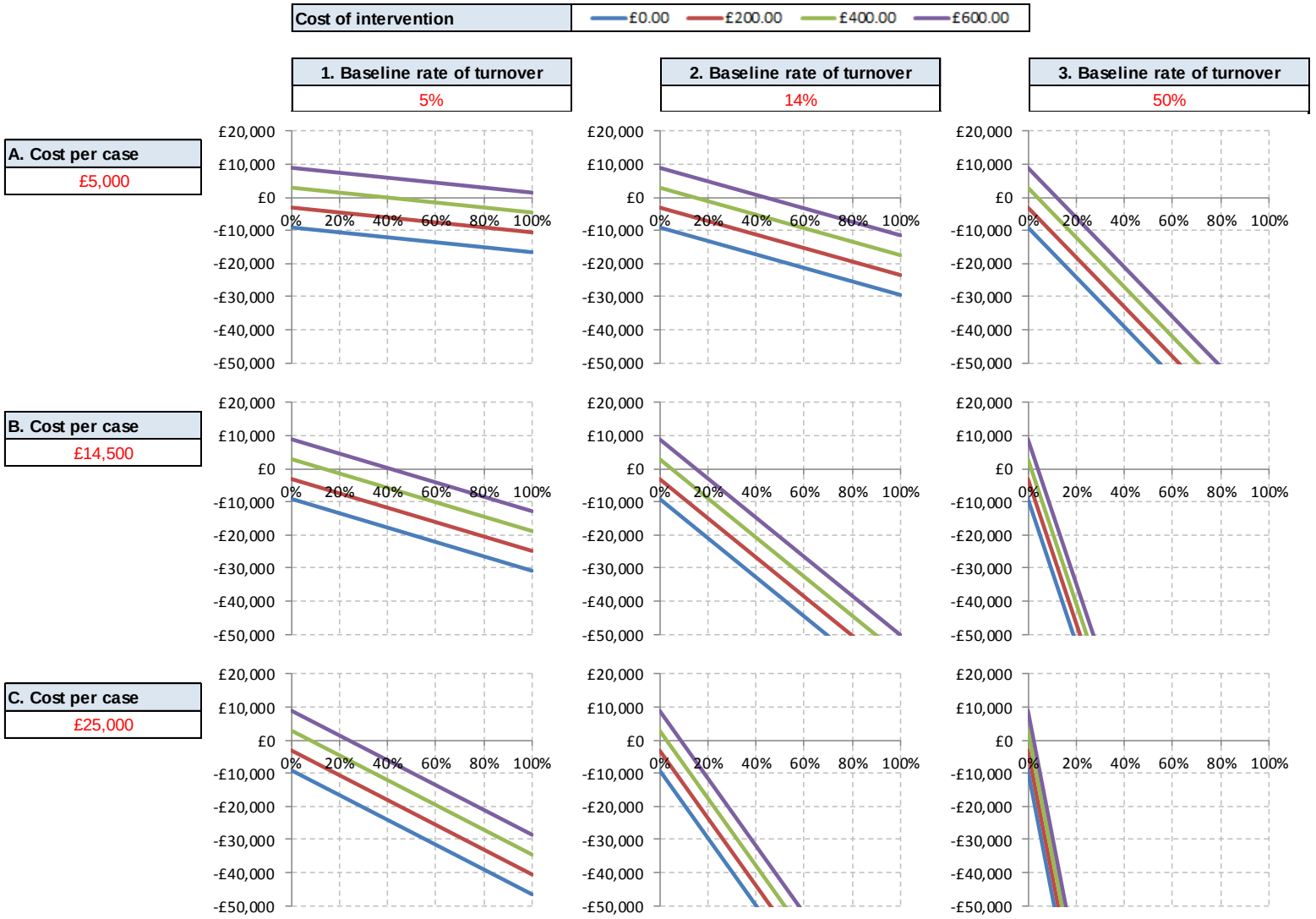


Figure 3.4 shows a similar pattern of results to Figure 3.2 and Figure 3.3. As the baseline rate of turnover increases the result of changing the rate of turnover becomes more pronounced. The same effect is observed as the value of an employee increases. As baseline costs and rates are higher, the results become more pronounced because there is more capacity to benefit. These results are also presented in a breakeven analysis in Appendix A.

As there is such a wide range of interventions and organisations, it is not particularly useful to use one base case model. However, these diagrams allow stakeholders to look at the information that is relevant to their organisation and to the population group they are targeting (in this case, employees with disabilities or long-term conditions) in order for the results to be applicable and useful. If the ranges captured in these diagrams are not wide enough, the model user can input their own values. These graphs not only allow the stakeholder to see if an intervention is likely to result in cost savings in their organisation but can also be used as a tool to assist in choosing between interventions.

## 3.6 SCENARIO ANALYSIS

Scenario analysis allows the impact of varying inputs upon the results to be explored. Sensitivity analysis typically allows one of two inputs to be varied within a range. In scenario analysis, any number of input parameters can be changed to create a 'scenario' and the effect on the results reported.

### 3.6.1 Discount Rate

Table 3.4 shows the cost difference each year when a discount rate of 3.5% (as in the base case) is used and when a discount rate of 1.5% is used. These discount rates are reported as recommended in the NICE process and methods manual. The assumptions are stated in Section 3.1 and below:

- Intervention cost is applied once in year one;
- Effectiveness is assumed equal each year.

**Table 3.4: Discount rate scenario analysis**

| | **Incremental cost (3.5% discount rate)** | **Incremental cost (1.5% discount rate)** |
|---|---|---|
| Year 1 | -£12,971 | -£12,971 |
| Year 2 | -£34,519 | -£34,943 |
| Year 3 | -£55,338 | -£56,591 |
| Year 4 | -£75,452 | -£77,918 |
| Year 5 | -£94,887 | -£98,930 |

### 3.6.2 Condition-Specific Inputs

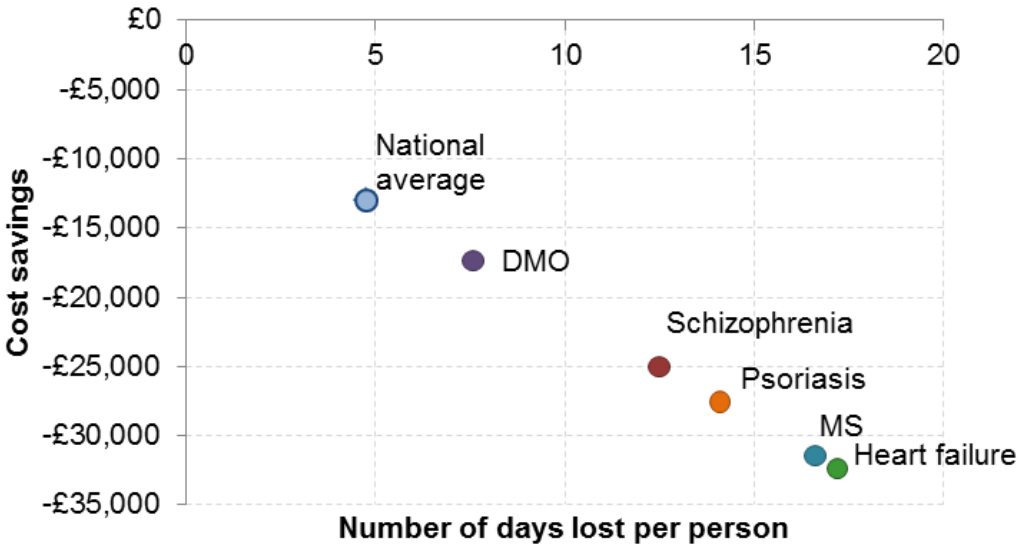
The model has been populated with national-level average inputs. Some inputs have been identified that report on the baseline rate of absenteeism by five chronic conditions (psoriasis, diabetic macular oedema (DMO), schizophrenia, heart failure and multiple sclerosis (MS)) [11]. Table 3.5 outlines the average days taken as sick leave by each disease area.

**Table 3.5: Condition-specific baseline absenteeism**

| Condition | Average days sick leave |
|---|---|
| Psoriasis | 14.1 |
| DMO | *Additional* 2.8 days (added to national average of 4.78 = 7.58) |
| Schizophrenia | 12.5 |
| Heart failure | 17.2 |
| MS | 16.6 |

The four-way sensitivity analysis diagram for absenteeism (Figure 3.2) can be read across to view the impact that baseline number of days absenteeism has on the results. Figure 3.5 shows results of a scenario analysis when each of the condition-specific is inputted into the model. These are the results when all other parameters are held constant.

**Figure 3.5: Condition-specific absenteeism results**




Note: DMO = Diabetic macular oedema, MS = Multiple sclerosis

The graph shows that as the baseline number of days absenteeism increases, the cost savings also increase.

## 3.7 CASE STUDIES

### 3.7.1 Hypothetical case studies

The following illustrative case studies are included to aid interpretation of the four-way sensitivity diagrams provided in this report. The following examples are given in relation to staff turnover, but similar analysis can be applied to the other categories included in the model (i.e. absenteeism and productivity).

**Case Study A**

Although the national average rate of staff turnover is 13.6%, Company A has a lower than average rate of turnover. Company A's rate of turnover is only 5% per year.

Company A mainly employs very specialist staff with specific experience. Therefore, the average cost of replacing a lost employee is higher than the national average. It costs Company A £25,000 on average to replace each employee. This cost includes recruiting, selecting and training a replacement employee.

Although the rate of staff turnover is low, the cost of replacing lost staff is high so Company A is considering implementing an intervention that costs £600 per employee to support employees with long-term or chronic conditions to reduce staff turnover.

Company A is shown on the four-way sensitivity diagram by the blue arrows (Figure 3.6). The purple line represents the £600 intervention that Company A are considering implementing.

Company A can analyse the relevant graph from the four-way sensitivity analysis with the appropriate cost line. This graph is shown in Figure 3.7. Company A can use this graph to decide if it is likely to be worthwhile implementing the intervention (from a financial perspective). The graph shows that in order to achieve a saving, the intervention would need to reduce staff turnover by around 25%. Company A can decide whether they think it is likely that the intervention will achieve this reduction and, therefore, whether the intervention is likely to result in net cost savings for the company.

If the other inputs within the model were varied, the results of this graph would change. Therefore, it is important that Company A review all inputs that are included in the model before making decisions using this analysis.

**Figure 3.6: Company A on the four-way sensitivity analysis diagram**

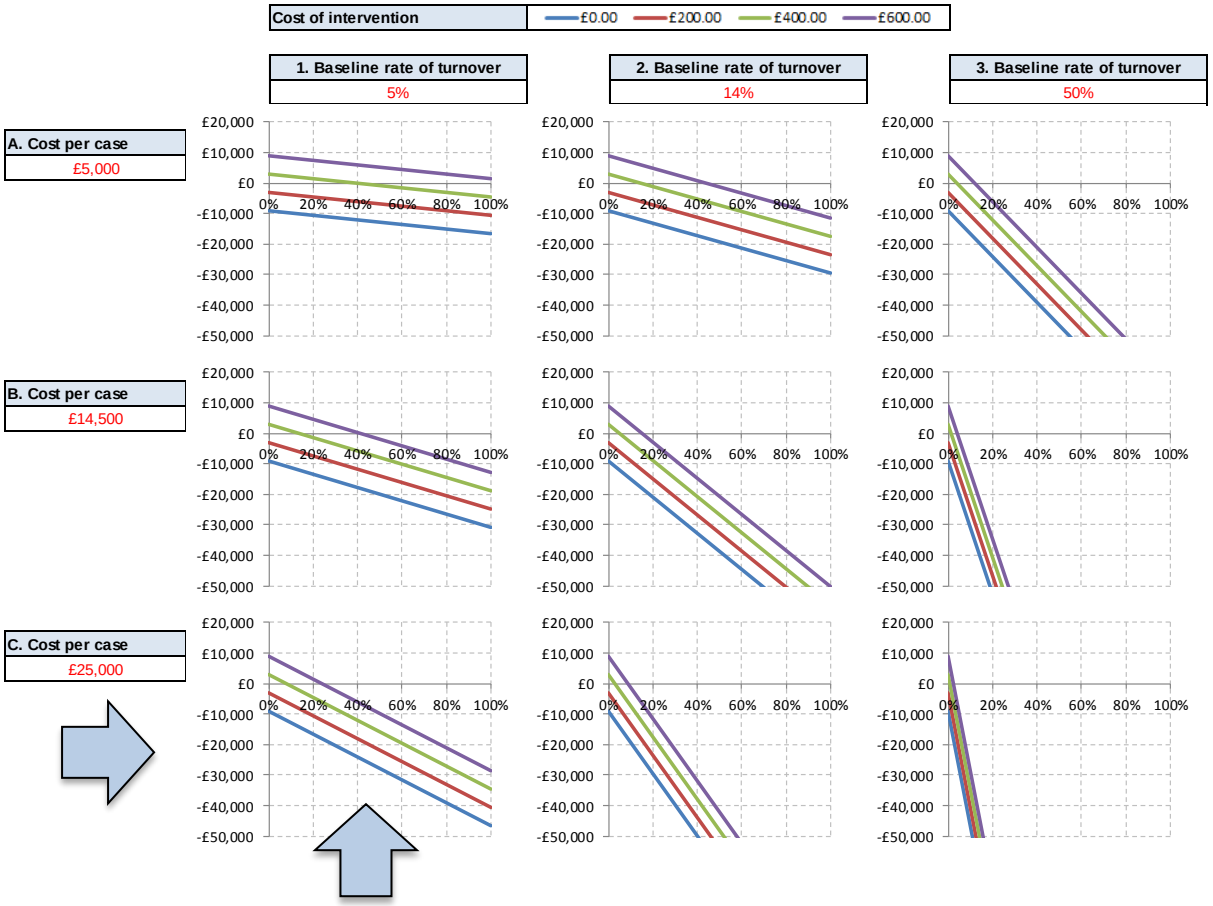
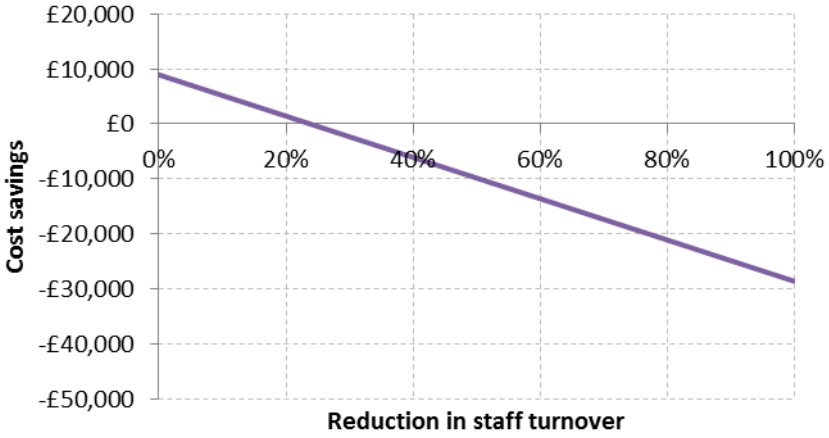



**Figure 3.7: Analysis relevant to Company A**



**Case Study B**

Company B is based in an industry that has a high rate of staff turnover (50%) but a low cost of replacing lost staff (£5,000). Company B has identified that many employees leave the company due to employees developing musculoskeletal disorders or similar conditions and have, therefore, decided to explore interventions to support these employees to stay in work.

Company B are considering the same intervention as Company A. This intervention aims to reduce staff turnover by supporting employees with chronic or long-term conditions to stay in work. The intervention costs £600 per person. Company B is shown on the four-way sensitivity analysis diagram by the blue arrows (Figure 3.8). The relevant graph to Company B is shown in Figure 3.9.

Company B can use the relevant graph to determine whether they think the intervention will result in net cost savings. In Company B's case, staff turnover would need to be reduced by just over 10% in order to save costs. This is less of a reduction that was needed for company A to achieve a cost saving. Although Company B has a lower cost of replacing staff, the rate of turnover is much higher.

If the other inputs within the model were varied, the results of this graph would change. Therefore, it is essential that all other input parameters within the model are reviewed for relevance to Company B before using this analysis to aid decision making.

**Figure 3.8: Company B on the four-way sensitivity analysis diagram**

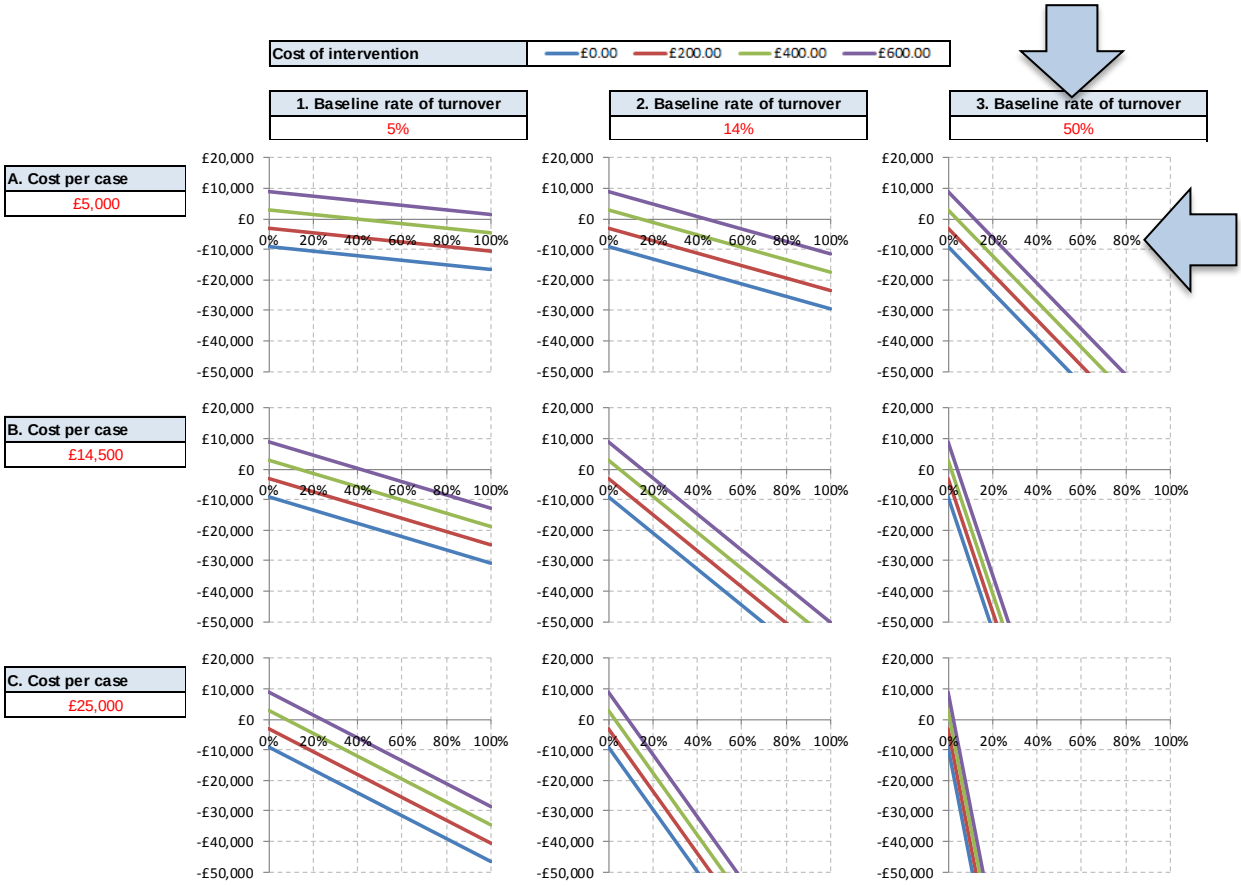
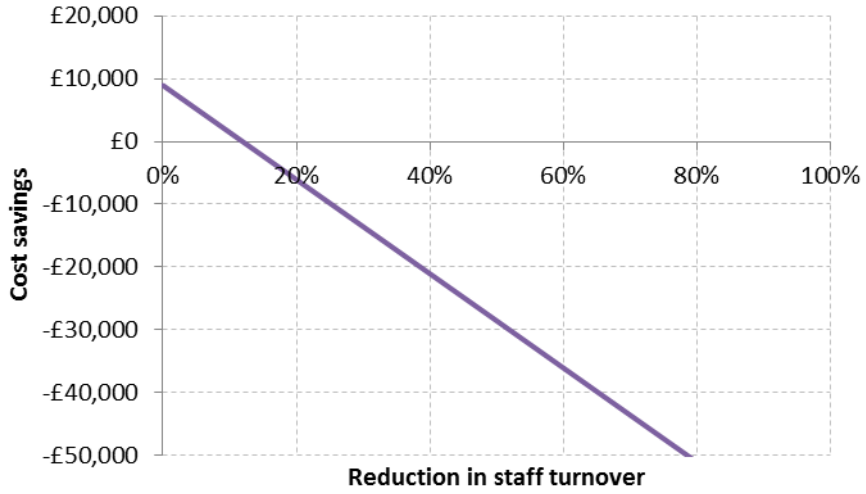


**Figure 3.9: Analysis relevant to Company B**




### 3.7.2 Real-World Case Study

Lloyds Banking Group (LBG) [12] published a report outlining a workplace health intervention to manage workplace adjustments as a core business process. The intervention saw LBG undergo a transformation of the workplace adjustment process. This approach included:

- Appointing a business manager to be responsible for the whole process from start to finish;
- Providing centralised funding, rather than using line managers' local budgets so funding cannot be traced back to the individual and removing any financial disincentives to pay for workplace adjustments;
- Empowering employees to self-refer to the process;
- Creating a catalogue of pre-approved physical adjustments.

Within LBG approximately 19% of the workforce used the service. Three quarters of employees seeking workplace adjustments had a physical disability. The most frequent physical disabilities reported related to pain, of which most were for back conditions, followed by shoulder and neck pain and arthritis. Forty-seven percent of employees had had their condition for over two years and 26% had had the condition for less than 6 months.

The most frequently requested adjustment was for an alternative chair which is consistent with the number of back problems reported. Fifteen percent of those using the service required non-physical adjustments. Non-physical adjustments most commonly consisted of changes to the work environment such as designated breaks, modified or flexible work hours, lower targets or parking arrangements.

The results reported in the LBG report have been incorporated into the economic model as far as possible and sensitivity analysis has been carried out. The following information which can be used in the model is reported in the LBG report:

- Number of employees using the intervention (18,893);
- Absenteeism:
    - 62% of employees reported a reduction in absence levels, the LBG report assumed a reduction of 1 day each and assumed and average salary based on ONS data. The cost of absenteeism per day in the model is the one included in the model base case, inflated to current prices (£148.70 [7]);
    - For the purposes of the model it was assumed that this improvement occurred in the first year and was maintained for the duration of the intervention;
    - The LBG report states that a sample of 314 staff identified that the average sickness absence prior to the intervention was 34.5 days. However, it was not stated over what time period this number of days was taken over so it could not be incorporated into the model;
- The LBG report states that 'Eighty-five percent of those using the service reported a significant improvement in performance; and 77% of line managers reported a dramatic improvement in performance' but the increase is not quantified.

The report also stated that:

- The average assessment and service cost per case dropped from £750 to £500 over four years;
- The average cost per case dropped from £1,500 to £700 over four years.

However, it is not clear what the 'cost per case' represents and what costs are encompassed within the two definitions above ('cost per case' and 'assessment and service cost per case') and therefore this has not been incorporated into the model.

The results of the intervention for each included component of the economic model are reported in Table 3.6 using the inputs outlined above over four years. The overall cost savings are not reported because the cost of the intervention was not reported and therefore conclusions cannot be drawn about overall net cost savings. Only incremental costs are included. Before and after intervention results are not available because the LBG report does not state the baseline number of sick days.

**Table 3.6: Case study results – four year time horizon (discounted) – intervention cost per year**

| | **Incremental cost** |
|---|---|
| Cost of absenteeism | -£6,621,690 |
| Cost of absenteeism per person | -£350.48 |

The table above shows the cost savings for each component reported in the LBG report for a population of almost 19,000 employees over four years. However, it is important to note that there will be a cost to the intervention that is not accounted for in the calculations above. LBG also reported an improvement in productivity (but this was not reported quantitatively). Therefore, a sensitivity analyses are reported for both cost of intervention and increase in productivity (in Figure 3.10 productivity is assumed to increase in year one and remain at this level for the duration of the intervention and an annual cost of intervention is applied).

**Figure 3.10: Two-way sensitivity analysis – four year time horizon (discounted)**

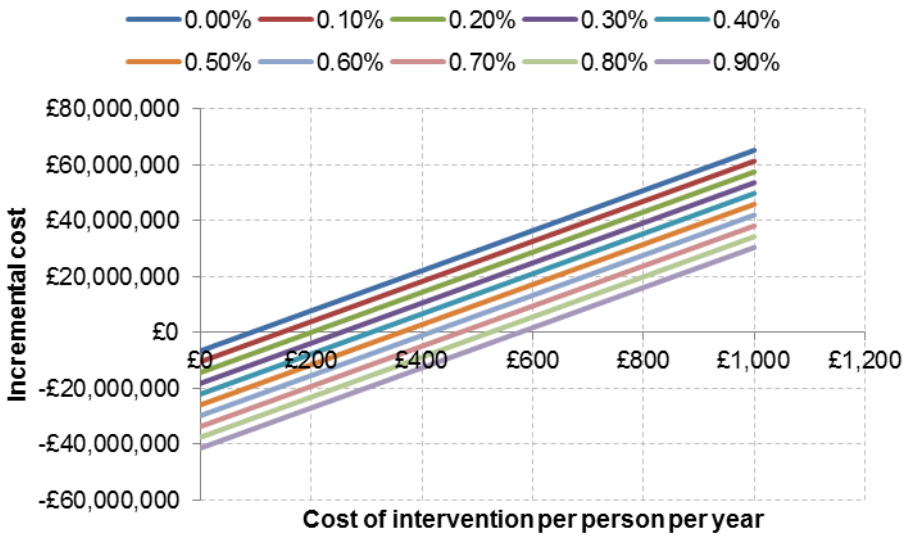



Figure 3.10 shows the effect on the results if intervention costs and an increase in productivity were included in the calculations. The graph shows that as the intervention cost increases, the increase in productivity would also need to be larger to achieve cost savings.

It is not clear from the LBG report whether the intervention costs are incurred each year or as a one-off cost. In addition, it is not clear over what duration the effects of the intervention may have lasted. Figures 3.11 and 3.12 also show the effect of varying the improvement in productivity and the cost of the intervention. However, to produce these graphs, the intervention cost was assumed to be a one-off cost. Graph 3.11 illustrates the results at one year and Graph 3.12 shows the results at a 4-year time horizon.

**Figure 3.11: Two-way sensitivity analysis – one-off intervention cost - one year time horizon (discounted)**

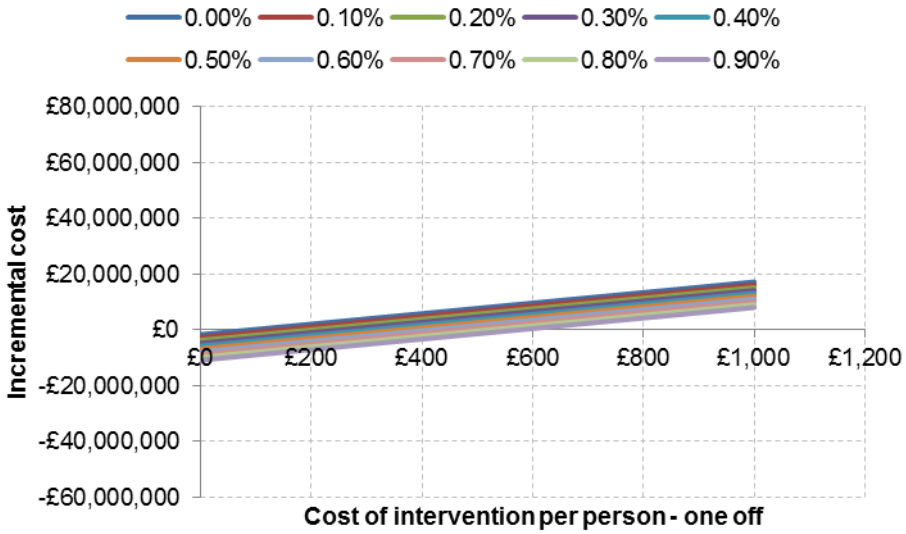



**Figure 3.12: Two-way sensitivity analysis – one-off intervention cost – four year time horizon (discounted)**

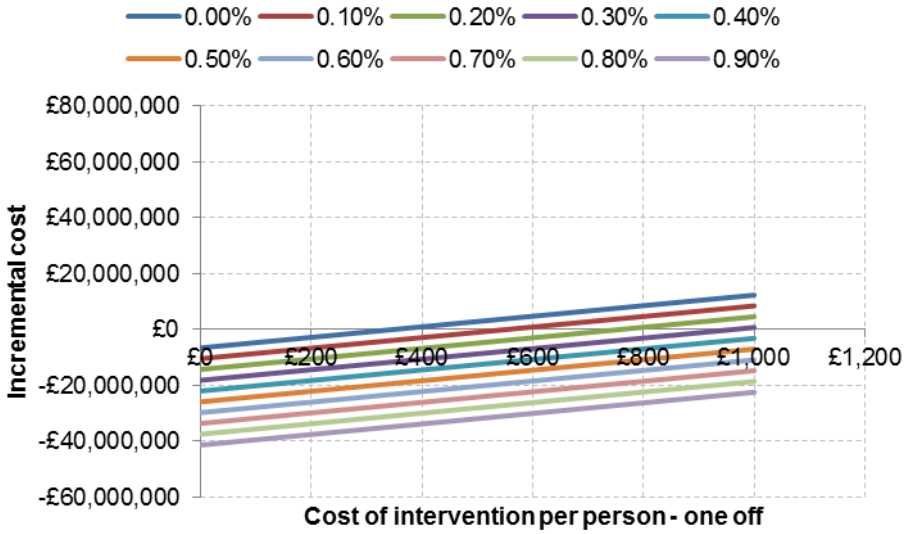



Figure 3.11 shows that, when the time horizon is shorter, there is a smaller range of plausible results. The effectiveness scenarios are much closer together because there is less capacity to benefit from a change in productivity over just one year, meaning that the change in productivity has a smaller impact on the results. In Figure 3.12 the results are more spread out because they are reported over four years. The elasticity of the outcomes is not as great as that in Figure 3.10 (where the intervention costs are applied each year), which shows that the cost of the intervention has a smaller effect on the results when applied as a one-off cost.

# Section 4: Discussion

Due to the variation in type of intervention, each is likely to have different costs associated with running the intervention and is likely to have different effects. For example, some interventions may have a positive impact by improving productivity, others may reduce the number of days of sick leave taken and others still may reduce employee turnover. In reality, it is likely that all interventions will affect all of these factors and more in some way. Further, an intervention may have different effects on different levels of staff seniority, baseline measures and a number of external factors. The challenge for the economic modelling is that each intervention has a different level of impact on each of these factors.

It is not possible to say how effective and cost-saving an intervention will be for an 'average' organisation, because the effect that the intervention will have depends on the type of organisation. Organisations differ in many ways, including the size of the organisation, the sector that the organisation belongs to and the culture of the organisation. All of these variations result in different baseline rates of staff turnover, sick leave *etc*. These variations mean that the same intervention will have different magnitudes of effect in different organisations. In addition, factors external to the workplace, such as the labour market and personal financial and domestic situations create additional variation. Likewise, the characteristics of each employee will differ. An intervention may have different effects on employees dependent on their level of seniority, type of work and individual nuances.

In general terms, it can be stated that an organisation with high baseline turnover and high costs of turnover can benefit from an intervention aimed at reducing staff turnover. Conversely, an organisation with a low baseline rate of turnover and a low cost of turnover is unlikely to see much benefit from a workplace intervention aimed at reducing staff turnover.

Due to these factors the model has been designed as an interactive cost-calculator which is intended to be used flexibly so that it can be tailored to an employer's workplace and to a specific intervention. The model structure is in place to be used as a flexible cost-calculator in which an employer can input data specific to their organisation. However, basecase inputs are included in the model to give an idea of the cost difference that might be expected. Based on the inputs in the basecase (outlined in Section 2.2), the results showed that low cost interventions with moderate rates of success would be likely to be cost saving in each year.

It is difficult to draw any broad conclusions from the basecase analysis (or any future case studies). The basecase and case studies evaluate specific interventions, in specific contexts, for specific population groups. Therefore, it is recommended that model be made available on the NICE website as a user–friendly tool to aid decision making and that model users input data specific to their organisation.

It is important to note that, although an employee perspective is not required in the economic model, the benefits of an employee returning to work are over and above benefits that can be quantified in monetary terms for an employer. There are also many health and quality of life benefits to the employee. In addition, there may be other wider societal impacts of implementing workplace health interventions, this could include benefits to the health care system, to local authorities and unpaid activities such as volunteering, child care and domestic work [13]. These factors are not quantified in the economic model, and, similarly to the inputs included in the cost-calculator, would be likely to differ on a case-by-case basis.

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# APPENDIX A

# Breakeven Analysis

## Four-way threshold analysis – Absenteeism

| | 1. Baseline absenteeism (days) | 2. Baseline absenteeism (days) | 3. Baseline absenteeism (days) |
|---|---|---|---|
| | 2 | 5 | 17.2 |

**A. Cost of absenteeism: £50**

| Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) |
|---|---|---|---|---|---|
| £0 | Always cost saving | £0 | Always cost saving | £0 | Always cost saving |
| £200 | Always cost saving | £200 | Always cost saving | £200 | Always cost saving |
| £400 | Always cost saving | £400 | Always cost saving | £400 | Always cost saving |
| £600 | Cost saving cannot be achieved | £600 | 60% | £600 | 20% |

**B. Cost of absenteeism: £149**

| Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) |
|---|---|---|---|---|---|
| £0 | Always cost saving | £0 | Always cost saving | £0 | Always cost saving |
| £200 | Always cost saving | £200 | Always cost saving | £200 | Always cost saving |
| £400 | Always cost saving | £400 | Always cost saving | £400 | Always cost saving |
| £600 | 50% | £600 | 20% | £600 | 4% |

**C. Cost of absenteeism: £300**

| Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) |
|---|---|---|---|---|---|
| £0 | Always cost saving | £0 | Always cost saving | £0 | Always cost saving |
| £200 | Always cost saving | £200 | Always cost saving | £200 | Always cost saving |
| £400 | Always cost saving | £400 | Always cost saving | £400 | Always cost saving |
| £600 | 18% | £600 | 10% | £600 | 2% |

## Four-way threshold analysis – Productivity

| | 1. Percentage affected | 2. Percentage affected | 3. Percentage affected |
|---|---|---|---|
| | 50% | 75% | 100% |

**A. Value of employee: £20,000**

| Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) |
|---|---|---|---|---|---|
| £0 | Always cost saving | £0 | Always cost saving | £0 | Always cost saving |
| £200 | Always cost saving | £200 | Always cost saving | £200 | Always cost saving |
| £400 | Always cost saving | £400 | Always cost saving | £400 | Always cost saving |
| £600 | Always cost saving | £600 | Always cost saving | £600 | Always cost saving |

**B. Value of employee: £50,000**

| Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) |
|---|---|---|---|---|---|
| £0 | Always cost saving | £0 | Always cost saving | £0 | Always cost saving |
| £200 | Always cost saving | £200 | Always cost saving | £200 | Always cost saving |
| £400 | Always cost saving | £400 | Always cost saving | £400 | Always cost saving |
| £600 | Always cost saving | £600 | Always cost saving | £600 | Always cost saving |

**C. Value of employee: £75,000**

| Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) |
|---|---|---|---|---|---|
| £0 | Always cost saving | £0 | Always cost saving | £0 | Always cost saving |
| £200 | Always cost saving | £200 | Always cost saving | £200 | Always cost saving |
| £400 | Always cost saving | £400 | Always cost saving | £400 | Always cost saving |
| £600 | Always cost saving | £600 | Always cost saving | £600 | Always cost saving |

## Four-way threshold analysis – Staff turnover

| | 1. Baseline rate of turnover | 2. Baseline rate of turnover | 3. Baseline rate of turnover |
|---|---|---|---|
| | 5% | 14% | 50% |

**A. Cost per case: £5,000**

| Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) |
|---|---|---|---|---|---|
| £0 | Always cost saving | £0 | Always cost saving | £0 | Always cost saving |
| £200 | Always cost saving | £200 | Always cost saving | £200 | Always cost saving |
| £400 | 38% | £400 | 15% | £400 | 4% |
| £600 | Cost saving cannot be achieved | £600 | 43% | £600 | 12% |

**B. Cost per case: £14,500**

| Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) |
|---|---|---|---|---|---|
| £0 | Always cost saving | £0 | Always cost saving | £0 | Always cost saving |
| £200 | Always cost saving | £200 | Always cost saving | £200 | Always cost saving |
| £400 | 14% | £400 | 5% | £400 | 2% |
| £600 | 40% | £600 | 15% | £600 | 4% |

**C. Cost per case: £25,000**

| Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) | Intervention cost | Reduction in turnover required to be cost-saving (%) |
|---|---|---|---|---|---|
| £0 | Always cost saving | £0 | Always cost saving | £0 | Always cost saving |
| £200 | Always cost saving | £200 | Always cost saving | £200 | Always cost saving |
| £400 | 8% | £400 | 3% | £400 | <1% |
| £600 | 24% | £600 | 9% | £600 | 3% |