Sickness Absence as an outcome measure in Cochrane Reviews

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Introduction

Sickness absence is frequently used as an outcome measure in occupational health intervention studies. Even though it looks as a straight forward outcome measure it is a rather complicated concept. Sickness absence is an indicator of both health, health related behaviour and productivity. Studies have shown that sickness absence is a good predictor of mortality and other health outcomes.(1) On the other hand it is also clear that there are many factors that influence behaviour related to reporting sick or returning to work.(2) It is relatively easy to measure the costs related to sick leave and thus sick leave is often used as a proxy of productivity loss in economic evaluation studies.(3) Data on sickness absence are gathered automatically in many firms, insurance institutions or countries. This additional feature makes sickness absence an attractive outcome measure. The current document is made to give some guidance in the use of sick leave as an outcome measure in Cochrane Reviews. This is a living document that will be updated regularly.

What concept?

Since sick leave can be regarded as an indicator of various concepts it is good to determine in advance what this concept is in your review.(2) The WHO ICF concept of functioning can be helpful here.(4)
In most reviews it would be an indicator of health or functioning and be used to show that an intervention improves health such as in surgery or improves functioning such as in rehabilitation. This implies that the intervention would lead to more study participants being back at work at a specific moment of follow-up or that the intervention gets participants back to work sooner. For the use in economic evaluation studies see the appropriate chapter in the Cochrane Handbook. Because this is a world apart we will not deal with further economic analyses here.

What sick leave outcome to use?

Authors can provide many different data on sick leave which are not always usable. I would recommend using two outcomes that relate to the concept mentioned above: rate of return to work and time to return to work. If the authors don't give these outcomes as such, try to calculate them from the data that are provided in the article or ask the authors for the missing information.

Rate of return to work

More study participants being back at work would be called the rate of return to work. This is a dichotomous outcome measure and it would be calculated as the number of persons back at work at say 12 months follow-up divided by the total number of participants at start of follow-up. These data should be put into RevMan as a dichotomous outcome and then analysed as risk-ratios. Because the proportions are much bigger than 10% they should be analysed as risk-ratios. When you use odds ratios as the outcome measure the odds ratios will be an overestimation of the real risks. Take care that you indicate the experimental and control group in the correct way because a higher risk ratio means a greater chance of returning to work. The other option is to calculate the risk of **not** returning to work. In that case lower risk ratios would mean a preventive effect of the intervention.

Time to return to work

Study participants being back at work sooner would be called the time to return to work. This is not an easy outcome measure since, ideally, it should be analysed as time to event data and summarised as hazard ratios.(5) See the appropriate chapter in the Cochrane Handbook if you are able and willing to use the data as hazard ratios.
In practice, the data for such analyses are often not provided by the authors in the article and also not available from the authors. In many studies time to return to work is measured as a continuous variable as the average number of days off work among the study participants. It is then analysed as the mean difference in time to return to work. Even though this is actually not appropriate, for practical reasons I would accept also these mean differences as an outcome measure. The data should be put in RevMan as a continuous outcome measure using the means in the study groups and their standard deviations.

How to count what kind of days?

Some authors use the number of sick leave days by only counting the working days lost and others use calendar days meaning all days between the start and the end of the sick leave period. There is some evidence that this does not make much difference in the final sick leave figures. Of course it should be done similarly for both the intervention and the control group. I would advise to consider the outcomes measured in different ways as sufficiently similar to combine.

Combining dichotomous and continuous outcome measures

Once you have been able to extract the data on rates or time to return to work, the next step is how to synthesise these data. If the participants, the intervention, the control interventions and the outcomes are sufficiently similar, studies can be combined in one comparison and be used for meta-analysis. However, if the outcome is measured as a rate of return to work in one study and as time to return to work in another study synthesis is not easily possible because you cannot simply sum up rates and averages. There is, however, a simple technical trick available in the Cochrane Handbook that enables you to recalculate mean differences into odds ratios or the other way around into effect-sizes. The condition for doing so is of course that you are sure that both measure the same outcome at the same moment of follow-up. Even though this has been shown to be a valid assumption for several health outcomes such as lung function parameters and blood loss, this has not been evaluated for sick leave data yet. I feel that there are no good reasons against the combining of these data and I therefore recommend combining. This will make the results of a review much more straight forward. For an example see the review by Martimo et al. (6) See the Cochrane Handbook for details of the method paragraph 9.4.6 Combining dichotomous and continuous outcomes.

Risk of bias

Sometimes, authors are not clear if all study participants are on sick leave at the start of the study and they just give the average number of days on sick leave among the study participants. If the proportion of participants on sick leave at the beginning of the study differs between the intervention and the control group this is of course a serious risk of bias.

Validity of measurement

Relatively little is know about the validity of measuring sickness absence. Essentially it is always a self-report measure because only workers themselves can report that they are not capable to work due to illness. The reporting of sick leave is dealt with in many different ways. It can be based on retrospective reporting by the individual on how often and how long he or she has been off work in a period in the past. It can also be based on a prospective collection of data by for example the personnel department of a firm that registers the day of start of sick leave and the day of return to work. There are some studies that show that self-report data are as valid as those gathered by firms, but other studies state that these results can differ. Until this has been resolved I would advise to treat all measurements equally.

Other sick leave outcome measures

There can be other measures such as the frequency of sick leave episodes or the duration of sick leave episodes but I would recommend only using them if there are sufficient arguments that the intervention specifically influences these outcomes. For example use the frequency of sick leave episodes if the intervention is specifically intended to make participants report sick less often. Otherwise use the rate of return to work or time to return to work.

However, to make the matters still more complicated, the above holds only for treatment interventions. If the review is about prevention of sickness absence then the intervention would probably aim at preventing workers to fall ill, to report sick and to return to work sooner as well. In that case, the average number of days on sick leave is the outcome measure that would take into account all these mechanisms.

Reference List

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