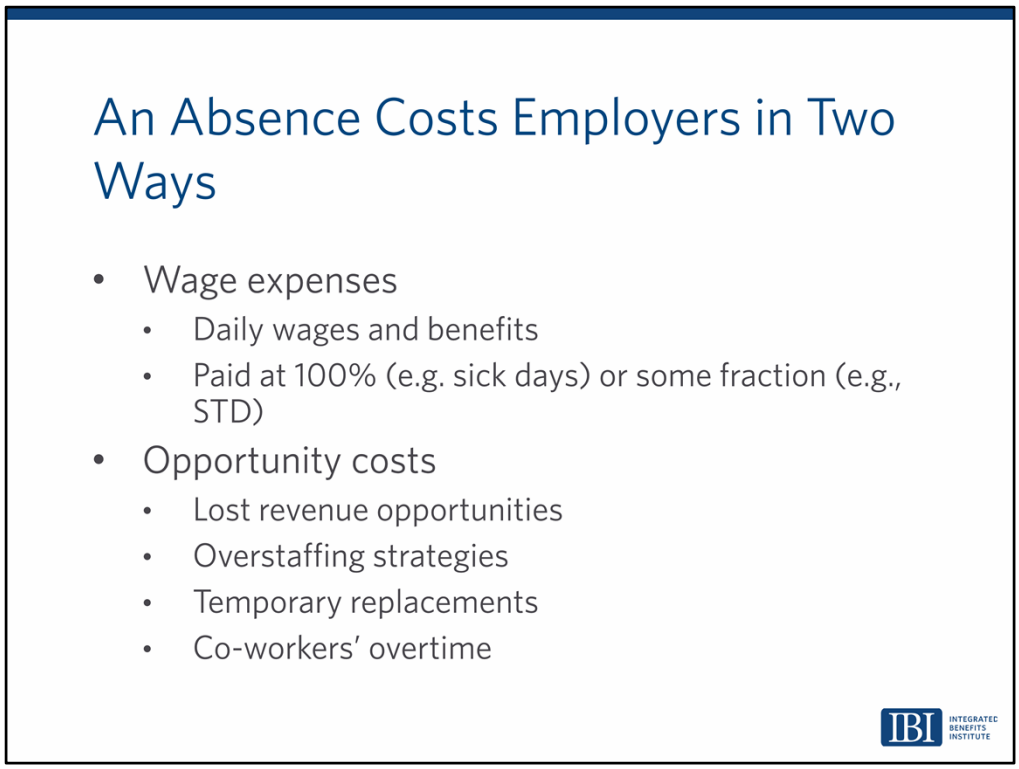
IBI recently explained its method of valuing a health-related absence to a group of benefits professionals from one of our member organizations. The valuation method takes into account both wage replacement expenses and associated opportunity costs – such as missed revenue opportunities, overtime and substitute workers.

This slide deck was developed for that presentation. We have included descriptive notes to the slides that provide more detail about the method. For additional information, please contact:

Brian Gifford, Ph.D.
Senior Research Associate
bgifford@ibiweb.org
(415-222-7217)

About IBI

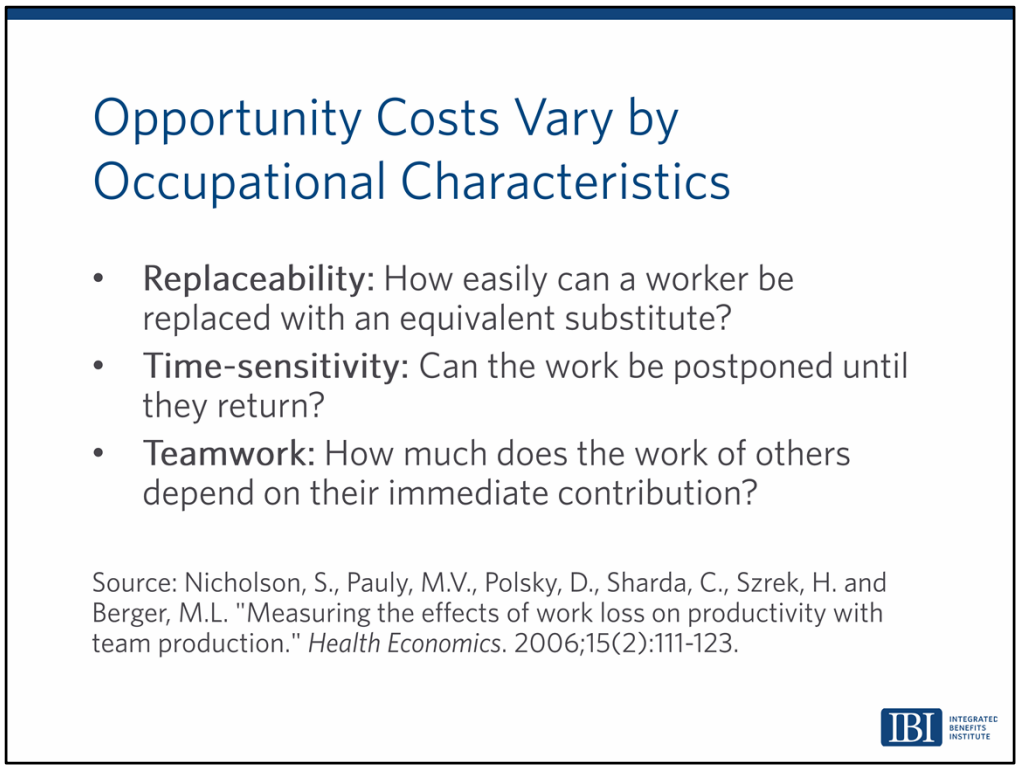
- National, not-for-profit corporation
- 850+ corporate sponsors (as of October 2013)
  - 90% employers
- Use research and modeling tools to understand and demonstrate the link between workforce health, *productivity* and business performance



We understand that when an employee is absent from work, an employer incurs two distinct kinds of costs.

First there are the wages and benefits that the employee is paid even though they did not work. The amount of these can be equal to normal wages and benefits (for example, when someone takes a paid sick day), some fraction of wages and benefits (for example, when an absence is paid under a disability policy), or equal to zero (for example, because an employee does not have sick day benefits or because an absence is taken under FMLA after sick day benefits have been utilized). Generally, paid wages and benefits for absence will appear in an organization's financial reporting with other operating expenses (even if not always itemized as "sick leave"). In practice, even an absence by an employee who is not eligible for paid sick leave will impose some expenses on an employer to the extent that the employer still pays for benefits such as health insurance (as is required under FMLA, for example).

Second, an absence imposes economic opportunity costs on employers. These do not show up in financial statements, but increase the costs of doing business to the extent that absences result in missed opportunities to make sales, or require employers to maintain a larger than optimal staff prospectively, rely on temporary replacement workers (or divert other workers from their usual duties), or pay overtime to other workers in order to maintain the work flow.

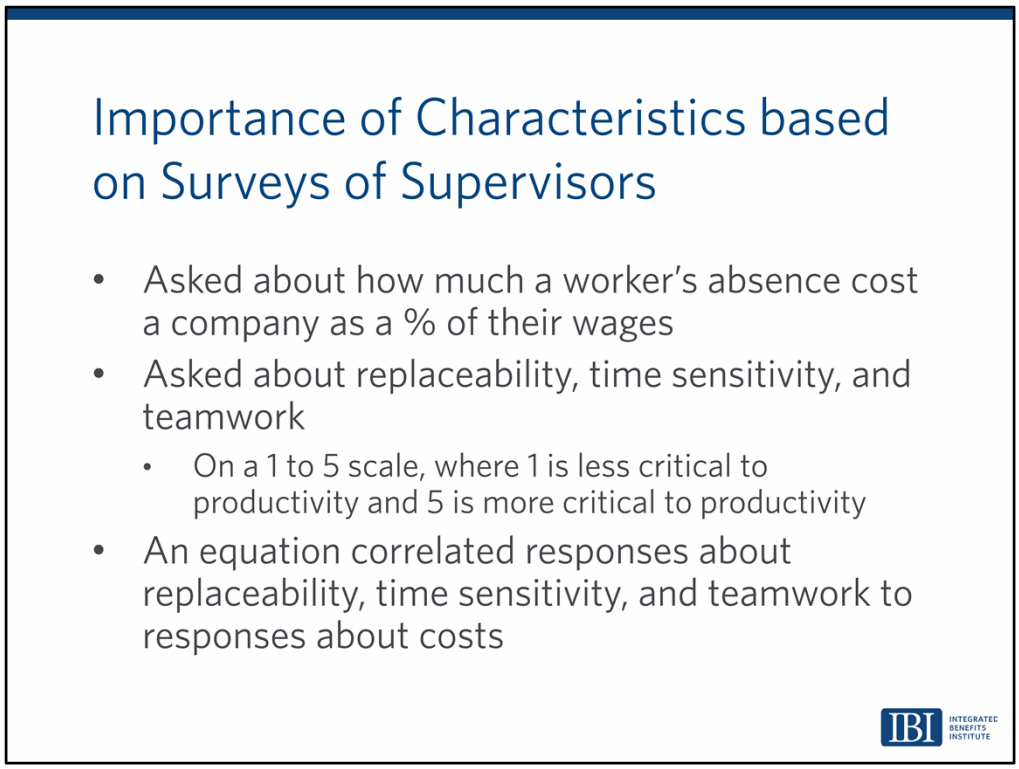


From a traditional economics perspective, the daily amount of productivity per worker for a given employer (or industry, or labor force) is equal to the average worker's daily wages. Thus in principle, when a worker is absent, the employer loses the productivity equal to his or wages, and when the "average" worker is absent productivity losses are equal to average wages.

Recent economic studies by Sean Nicholson of Cornell University, Mark Pauly of the University of Pennsylvania and their colleagues suggest that productivity losses are higher than average wages to the extent that the work of an absent employee differs on three characteristics of their jobs:

1. Replaceability: How easily can a worker be replaced with an equivalent substitute?
2. Time-sensitivity: Can the work be postponed until they return?
3. Teamwork: How much does the work of others depend on their immediate contribution?

Generally speaking, costs are higher when employees are not easily replaced by equivalent substitutes, when they perform work that cannot be postponed, and when they work as members of teams.



How do we know that these three dimensions matter for the costs of absence?

Nicholson et al. (2006) conducted surveys of over 800 managers working in different industries and supervising employees in different occupations. They asked these managers questions about how work was organized in their workplaces and what happens to the flow of work when an employee in a particular occupation is absent.

For our purposes, the important questions were how often people of a particular occupation tended to be absent, and how much it costs the organization each day (on top of wages) if a person of a particular occupation is absent for three days or for two weeks (there was strong correspondence in the final results for both the three day and two week wording of the questions).

The managers were then asked about the three different work characteristics. Specifically they were asked:

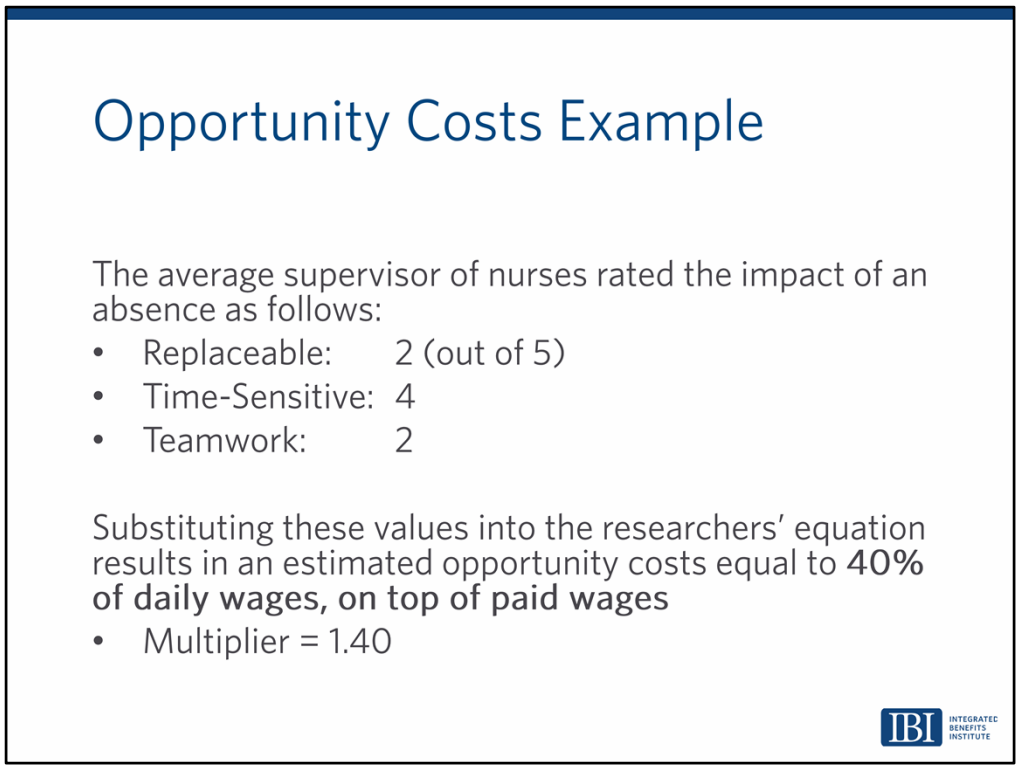
- "How easy is it to replace this worker (either with an outside temp or a transferred coworker) during a 3-day absence? Please use a scale where 1 is 'easy to replace with a worker of similar quality or productivity' and 5 is 'impossible to replace'."

- "How time sensitive is this worker's output using a scale where 1 is 'work that can be postponed easily' and 5 is 'work that cannot be postponed without very severe consequences'?"

- “How much does this worker function as part of a team using a scale where 1 is ‘the worker functions entirely separately from other workers’ and 5 is ‘the worker is such a crucial member of the team that the team’s output or activity is wiped out by his or her absence’?”

(from Nicholson et al. 2006, p 115)

The researchers then estimated a regression equation that modeled the costs of different occupations’ absences (as a % of their daily wages) as a function of their replaceability, time sensitivity, and teamwork. A number of subsequent steps were taken to scale the responses, but essentially the equation is solved for each different occupation based on managers average responses. This produces an average productivity multiplier for each occupation. In turn, the solution for each occupation can stand in for the solution to similar types of occupations that were not included in the study. For example, results for receptionists and records clerks in medical offices could stand in for administrative support workers more generally.



We use hospital nurses as an example for calculating the opportunity costs.

On a scale of 1 to 5, the average supervisor of nurses rated them as follows:

- Replaceability = 2, suggesting that there are not perfect substitutes for nurses ready to step in, but they are not very hard to find, either.

- Time-sensitivity = 4, suggesting that nurses' work cannot wait until they come back (even if an absence would not incur the most severe consequences – that would have required almost every manager of nurses to rate time-sensitivity as a 5 out of 5).

- Teamwork = 2, suggesting that while nurses work with one another, they perform tasks relatively separately.

Substituting these three average values into the researchers equations, we see that according to the model, for each day that a nurse is absent, the opportunity costs to the hospital is equal to 40% of their daily wages and benefits. That is on top of the wages they are paid when absent, in which case we would express the upper boundary of the lost productivity multiplier as 1.40 (or 140% of daily wages and benefits).

Bear in mind that there as many different solutions to the equation as there are different occupations. The multiplier could be as low as 1.00 – in which an absence incurs no opportunity costs – but mathematically could be as high as 6.90. The average multiplier

across the occupations studied by Nicholson et al. (2006) was 1.44, while IBI has used their results to estimate that the multiplier for the entire US workforce (weighted for workers in different occupational categories) is 1.38.

Cost of an Absence Example – Paid Sick Day

- Daily Wages and Benefits: $332
- Payment rate for absence: 100%
- Multiplier: 1.40

$$Cost\ of\ Absence = Wages \times (Pay\ rate + Multiplier - 1)$$
$$= \$332 \times (1.0 + 1.4 - 1) = \$332 \times 1.4$$
$$\cong \$465$$

Now we can apply the multiplier to what most people think of as the costs when a worker is absent: wages and benefits.

Assume that a nurse earns the average daily wages and benefits for US nurses of $332. Also assume that the nurse has paid sick time (up to a point, of course) so that she (or he) receives wages and benefits at her full pay rate when absent due to illness.

The costs of an absence are therefore the wages and benefits ($332) multiplied by the sum of the pay rate (100%) and the fractional portion of the multiplier (e.g., the 40% of wages and benefits on top of daily wages. The reason for using the fractional portion of the multiplier in this formula will be explained more fully in the next slide).

From a payroll perspective, the cost of an absence is $332. But from an operations or strategic perspective, the costs are $465.

In other words, wage and benefits expenses account for about 70% of the total costs of an absences.

Cost of an Absence Example – Disability Day

- Daily Wages and Benefits: $332
- Payment rate for absence: 60%
- Multiplier: 1.40

$$\begin{aligned} Cost\ of\ Absence &= Wages \times (Pay\ rate + Multiplier - 1) \\ &= \$332 \times (0.6 + 1.4 - 1) = \$332 \times 1.0 \\ &= \$332 \end{aligned}$$

Just for an economics refresher, recall that it is common to assume that a worker's productivity is equal to what they get paid. If a person does not work, there is no productivity for the employer but presumably there are also no wage expenses. This will not be true under all circumstances.

As Nicholson et al point out, wages represent the lower bound of lost productivity due to absence. From one example they give, if an employer was able to predict absences perfectly and immediately hire enough equivalently skilled workers to cover those absences, they would suffer no productivity losses (Nicholson et al 2006). But they would incur wage expenses if they still paid the absent workers on top of the wages paid to substitutes.

In this respect, the wages per day paid – rather than wages per day worked – is the lower bound estimate of the wage cost of absence. To this amount we can add opportunity costs to derive the total cost of an absence.

When the wages paid to an absent worker are paid at 100% (as in the sick day example), it does not matter whether we multiply daily wages by the full multiplier or by the sum of the pay rate and the fractional portion. They are mathematically equivalent.

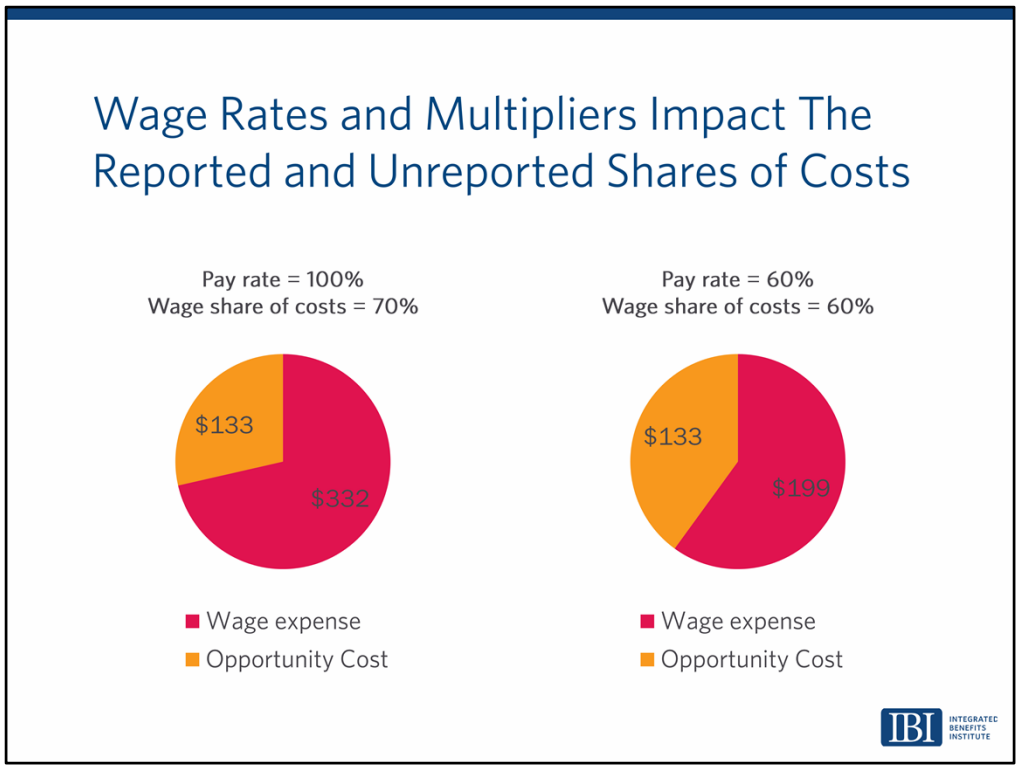
When an absence is paid at less than 100% of wages – as occurs in many disability programs such as STD, LTD and Workers' Compensation – we want to ensure that the opportunity costs are valued at the full wages, rather than the reduced value of wages. For

that reason, the general formula shown as $Wages \times (Pay\ rate + Multiplier - 1)$ is used.

In this example, the wages and benefits remain $332 and the multiplier remains 1.40, but the wage rate is 60% per day (≅ $199). Applying the fractional value of the multiplier (40%) to daily wages adds another ≅ $133 in opportunity costs.

The total costs of an absence in this example is $332 (it is only coincidental that by virtue of the example values of 60% and 40% = 100%, the total costs are equal to wages and benefits).

In other words, wage and benefits expenses account for about 60% of the total costs of an absences.



As a final point, it bears repeating that both the wage rate and multiplier impact not only the total cost of an absence, but how much lost productivity shows up as expenses and how much is unknown.

Since the opportunity cost portion is constant regardless of the wage replacements rate, with a multiplier of 1.40, an employer that only counts the wage portion of an absence accounts for 70% of total costs when wage replacements are 100% (e.g., for a sick day), but only accounts for 60% of total costs when wages replacements are 60% (e.g. for disability).

For this reason, understanding the mix of different kinds of illness absences – and what types of conditions are diving those absences – are critical to understanding how much of the costs of illness appear in financial statements and how much of the costs are taking a toll on business performance without being recognized.

Further Questions? Contact:

Brian Gifford, Ph.D.
bgifford@ibiweb.org
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