

## Health Insurance Impact Model for a Company

### 1. Objective

To measure how providing employee health insurance can improve company performance by reducing absenteeism, turnover, and increasing productivity.

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### 2. Variables

Symbol	Description	Unit
$C_i$	Annual insurance cost per employee	USD/year
$N$	Number of employees	persons
$A_b$	Average annual absenteeism before insurance	days/employee/year
$A_a$	Average annual absenteeism after insurance	days/employee/year
$P_d$	Productivity value per working day	USD/day
$T_b$	Annual turnover rate before insurance	%
$T_a$	Annual turnover rate after insurance	%
$C_t$	Average cost of replacing an employee	USD
$E_p$	Productivity improvement percentage	%

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### 3. Key Formulas

#### 3.1 Total Insurance Cost

$$TC = C_i \times N$$

This is the total annual cost the company pays for employee health insurance.

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#### 3.2 Savings from Reduced Absenteeism

$$S_A = (A_b - A_a) \times P_d \times N$$

This measures how much money the company saves due to fewer sick days.

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### 3.3 Savings from Reduced Turnover

$$S_T = (T_b - T_a) \times N \times C_t$$

This represents cost savings from fewer employees leaving and needing replacement.

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### 3.4 Productivity Gain

$$S_P = E_p \times (P_d \times 250 \times N)$$

Assumes 250 working days per year. This reflects higher productivity from healthier, more motivated employees.

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### 3.5 Net Benefit of Health Insurance

$$NB = (S_A + S_T + S_P) - TC$$

If  $NB > 0$ , the insurance plan generates a positive return on investment (ROI).

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### 3.6 Return on Investment (ROI)

$$ROI = \frac{NB}{TC} \times 100\%$$

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## 4. Example Calculation

Assume:

- $C_i = 1,200\text{USD}$
- $N = 100\text{employees}$
- $A_b = 6, A_a = 4\text{days}$
- $P_d = 200\text{USD/day}$
- $T_b = 15\%, T_a = 10\%$
- $C_t = 5,000\text{USD}$

- $E_p = 2\%$

Then:

1.  $TC = 1,200 \times 100 = 120,000$
2.  $S_A = (6 - 4) \times 200 \times 100 = 40,000$
3.  $S_T = (0.15 - 0.10) \times 100 \times 5,000 = 25,000$
4.  $S_P = 0.02 \times (200 \times 250 \times 100) = 100,000$
5.  $NB = (40,000 + 25,000 + 100,000) - 120,000 = 45,000$
6.  $ROI = \frac{45,000}{120,000} \times 100 = 37.5\%$

**Result:** The health insurance plan yields a **37.5% return on investment.**

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