

HealthCare Attrition Report



Predictive Analysis of
Employee Attrition
Factors in Healthcare

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Goals And Purpose

WHY UNDERSTAND ATTRITION?

This project aims to examine the elements affecting staff turnover in a healthcare organization using the Watson Healthcare Attrition dataset. This dataset, filled with employee-related features, allows for exploration and comprehension of employee turnover in the healthcare industry. Attrition is a major issue for any organization, but it's especially important in healthcare. High attrition rates can lead to a lack of experienced personnel, affecting patient care quality. Additionally, the expense of recruiting and training new employees can put a strain on an organization's resources. Therefore, understanding attrition factors is vital for maintaining a stable, experienced workforce and ensuring top-notch patient care.

The company benefits by pinpointing the main factors contributing to employee attrition, the organization can devise specific strategies to enhance employee retention. This could involve altering certain policies, offering extra support in identified problem areas, or introducing new programs to boost job satisfaction. Attrition reduction can result in improved morale, increased productivity, and a more positive work environment, all contributing to better patient outcomes. Insights from this analysis will direct the organization in taking tangible actions. For example, if the data shows a link between attrition and heavy workload, the organization might think about more evenly distributing tasks or hiring more staff. If a lack of career advancement opportunities is identified as a major factor, implementing a clear career progression plan might be beneficial. The specific actions will be based on the insights from the data.

THE PROBLEM STATEMENT

Employee attrition is a big problem for any organization. It can cause a loss of experienced staff, higher hiring and training costs, and possible disruptions to the organization's operations. In healthcare, high attrition rates can also affect the quality of patient care. So, understanding the factors affecting employee attrition is very important. This report aims to investigate the dataset and find some of the main causes of attrition within the organization.

REPORT OBJECTIVES

The main goals of this report are:

1. **Data Analysis:** Complete an analysis of the dataset, look at the connections between different features and their effect on attrition (attrition rate and attrition count).
2. **Find Key Factors:** Find the main factors that are causing attrition in the organization. This could be things like job happiness, workload, work-life balance, pay, and more.
3. **Give Recommendations:** Based on the insights from the data analysis, give some actionable recommendations that the organization can use to lower attrition and make employees happier.

By reaching these goals, the report will give useful insights that can guide the organization's employee retention strategies and help make a more stable, happy workforce. This can then lead to better efficiency and patient care outcomes.

The Investigation

DATASET INTRODUCTION

The dataset I'm using is the "Watson Healthcare Attrition" dataset. This dataset gives a complete view of the employee situation within the organization. It has many features, each showing a different part of an employee's work life, personal situation, and job happiness. These features go from simple demographic data like age and gender, to more specific work-related factors like daily pay rate, department, job role, and years with the current boss. The dataset's size is 1677 rows and 35 columns, allows for good statistical analysis. Occasionally, the columns will be referred to as **influencers** in this report.

1. GENERAL STATISTICS

An attrition rate of 11.9% indicates that approximately 12 out of every 100 employees leave the company. This could be considered high or low depending on the industry average and the company's historical attrition rates. With 199 employees leaving out of a total of 1676, the company might want to investigate the reasons for attrition. The fact that attritioned employees spend an average of 4 years in the company suggests that there might be a specific time period or event triggering the decision to leave. This is an indication of underlying hidden variables.

2. KEY INFLUENCER

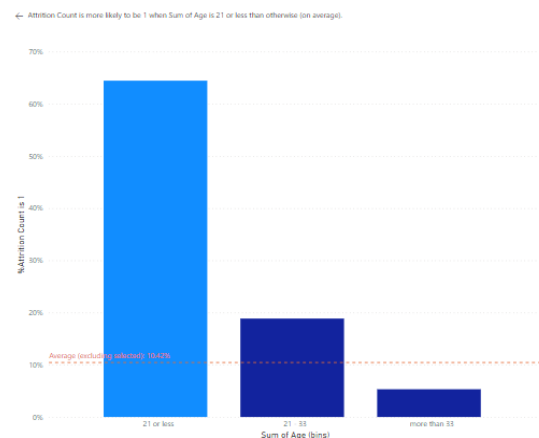


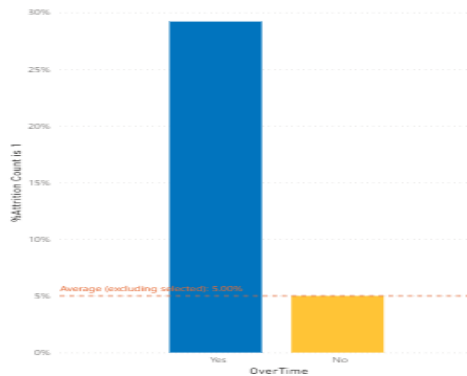
Using the Key Influencer visual we can learn about columns (influencers) that influence the output variable, Attrition Count. If attrition count is 1, it means that the individual has left the company and 0 indicates

otherwise. The number in the circle represents the strength of influence of the corresponding factor.

Let us look at influencers that increase the likelihood of attrition being 1.

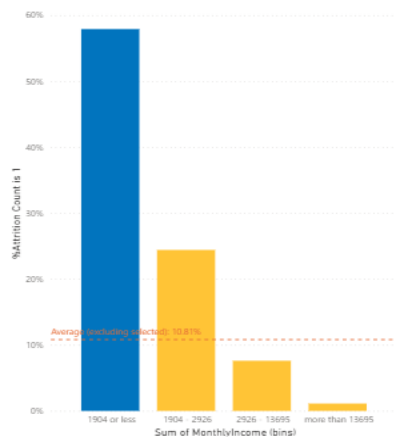
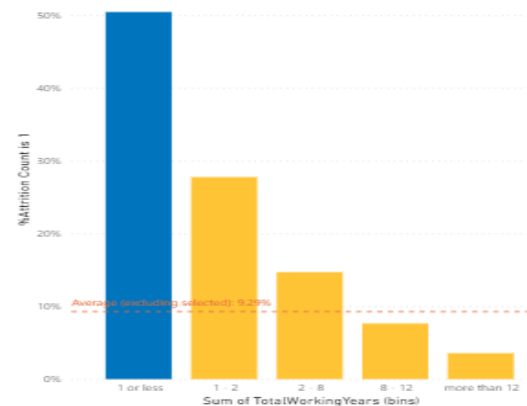
Age: Age is the highest-ranked determining factor in whether or not an individual is likely to attrition from the company. The data shows that younger employees (age 21 or less) are more likely to leave, with 64.4% of attritions occurring in this age group. However, this influencer only makes up 2.6% of the total data, suggesting that while attrition is high among younger employees, they represent a small portion of the overall workforce.





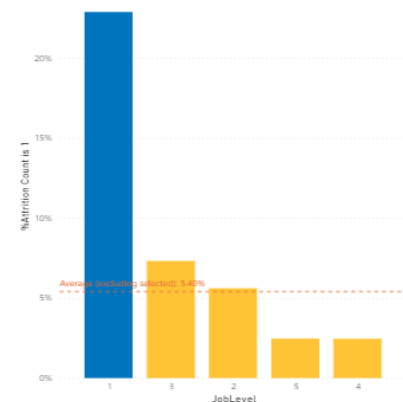
Overtime: Employees who work overtime are more likely to leave (29% of attritions), and this influencer represents a significant portion of the data (28.4%). Conversely, those who do not work overtime are more likely to stay, making up 71% of the non-attrition data.

Total Working Years: Employees with less industry experience (1 year or less) are more likely to leave, accounting for 50.48% of attritions. This group represents only 6.26% of the total data. As employees gain more experience, they are less likely to leave.



Monthly Income: Lower-income employees (earning \$1904 or less) are more likely to leave, accounting for 57.9% of attritions. Higher-income groups have lower attrition rates.

Job Level: Employees at job level 1 are more likely to leave, accounting for 22.9% of attritions. This group represents a significant portion of the data (37%).



Let us also look at the most relevant influencers that increase the likelihood of attrition being 0 i.e. the likelihood of staying at the company.

Overtime: Employees who do not work overtime are more likely to stay, as mentioned earlier.



Age: Older employees (age more than 33) are more likely to stay, making up 60% of the non-attrition data.

What does the data presented above imply?

Younger employees, particularly those aged 21 or less, are more likely to leave the company. This could be due to a variety of reasons. Younger employees might be exploring different career options and therefore might not stay long in one place. They might also be more willing to take risks and change jobs in search of better opportunities. On the other hand, older employees (those aged more than 33) are more likely to stay. They might have more stability in their personal lives and careers, which could make them less likely to change jobs.

Employees with less industry experience (1 year or less) are more likely to leave. They might be in the early stages of their careers and still exploring different job options. As employees gain more experience, they are less likely to leave, possibly because they have found a job or career path that they are satisfied with. Employees with less experience are also more likely to be overturned than employees with more working years. Employees who work overtime are more likely to leave as well. This could be because overtime often leads to burnout and job dissatisfaction. On the other

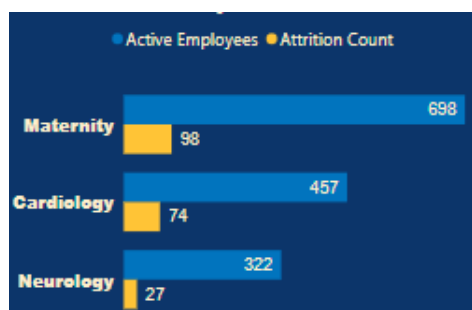
hand, employees who do not work overtime are more likely to stay, possibly because they have a better work-life balance. Furthermore, lower-income employees (earning \$1904 or less) are more likely to leave. They might leave in search of higher-paying jobs. Conversely, higher-income groups have lower attrition rates, possibly because they are satisfied with their compensation. Employees at a lower job level (job level 1) are more likely to leave, possibly because they are looking for better job opportunities or career advancements.

It is important to remember that the data only gives us potential reasons for people leaving. Actual reasons can be very different and complex. These factors are linked to attrition but don't necessarily cause it. There could be other factors we don't see.

Understanding these factors can help companies make plans to reduce attrition. This could mean more support for younger employees, reviewing overtime rules, ensuring fair pay, and clear career paths. The amount of data each key factor represents can greatly affect the analysis. More data leads to more reliable and broad conclusions. Less data might lead to less reliable conclusions that may not apply to everyone. So, it's important to consider this when interpreting the results as well.

3. DEPARTMENT AND ATTRITION

Let us look at the data for attrition by each department.

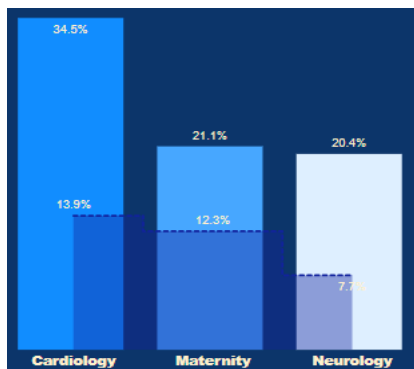


Department Size: The Maternity department has the highest number of active employees (698), which is 116.77% higher than the Neurology department, which has the lowest number of

active employees (322).

Attrition Rate: The Cardiology department has the highest attrition rate (13.9%), which is 80.14% higher than the Neurology department, which has the lowest attrition rate (7.7%). This suggests that the Cardiology department is experiencing a higher rate of employee turnover compared to the other departments.

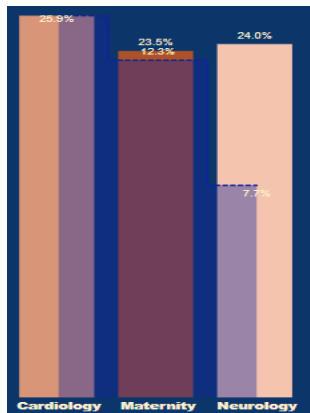
Department	Attrition Rate
Cardiology	13.9%
Maternity	12.3%
Neurology	7.7%



Job Level: If we sort the department attrition data by job level, we see that the attrition rate is highest for employees at job level 1 across all departments, with the Cardiology department having the highest attrition rate (34.5%) at this job level. Attrition rates at other job levels are much lower.

Overtime: The adjacent data shows attrition rate per department when overtime = “Yes”. Employees who work overtime have a higher attrition rate across all departments, with the Cardiology department having the highest attrition rate (31.1%) among employees who work overtime.

Department	Attrition Rate for Yes	Attrition Rate
Cardiology	31.1%	13.9%
Maternity	30.9%	12.3%
Neurology	21.3%	7.7%



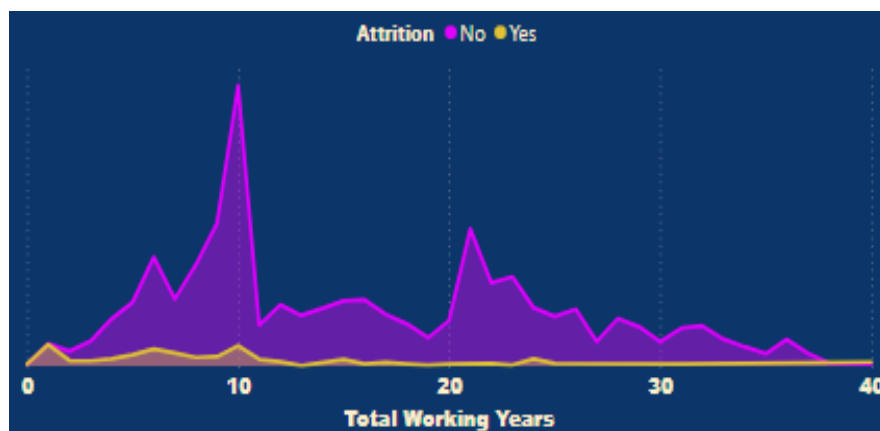
Age: The graph represents attrition rate by department for Age Interval < 30. The attrition rate is highest for employees aged 30 or less across all departments, with the Cardiology department having the highest attrition rate (25.9%) in this age group.

What do we learn from looking at Attrition Rates for each Department?

The data suggests that employees at job level 1 are more likely to leave the company, regardless of the department they are in. However, the impact of job level on attrition varies between departments. This could mean that lower-level employees in the Cardiology department are more dissatisfied or have more opportunities to move than those in other departments. Employees who work overtime are more likely to leave the company, regardless of the department suggesting that the workload or the overtime policies in the Cardiology department might be more strenuous, leading to higher attrition. Younger employees (age 30 or less) are more likely to leave the company, regardless of the department, potentially indicating that younger employees in the Cardiology department are more likely to seek other opportunities compared to those in other departments. The Cardiology department appears to be more affected by these factors, experiencing higher attrition rates overall. Factors such as departmental policies, workload, opportunities for advancement, or other variables not included in the data could be playing a role in affecting attrition rates.

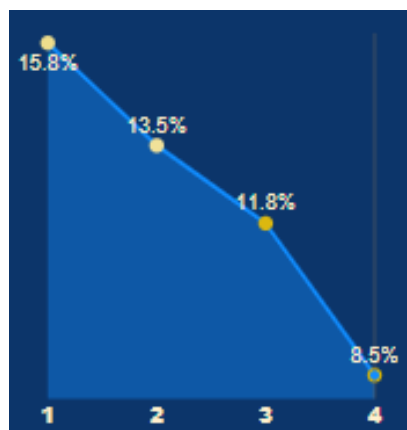
4. MONTHLY INCOME, TOTAL WORKING YRS AND ATTRITION

We can make some observations about the relationship between monthly income, total working years and attrition. The total monthly income is



higher for employees who have not left the company (attrition = No) than for those who have (attrition = Yes). This suggests that employees with higher incomes are less likely to leave the company or employees that stay get the opportunity to make money per month. When employees have 10 total working years, those who have not left the company make up 11.93% of the monthly income, indicating that employees with more experience in the industry tend to have higher incomes. This supports the idea that higher income is associated with lower attrition. Lastly, there is a sharp increase in the sum of monthly income for employees who have not left the company between 9 and 10 total working years. This could suggest that employees tend to receive significant pay increases or promotions around this time. Unfortunately the data set doesn't not contain enough information to sufficiently explore this sudden increase and is outside the scope of investigating attrition rates.

5. JOB SATISFACTION AND ATTRITION



The data reveals a clear correlation between job satisfaction and attrition rates. Employees with a job satisfaction rating of 1 (lowest) have the highest attrition rate at 15.8%, which is significantly higher than those with a job satisfaction rating of 4 (highest), who have the lowest attrition rate at 8.5 %. This suggests that employees who are less satisfied with their jobs are more likely to leave the company.

In contrast, when looking at active employees in relation to job satisfaction, those with a job satisfaction rating of 4 constitute the largest group, significantly outnumbering those with a job satisfaction rating of 2. This indicates that higher job satisfaction is associated with a higher number of active employees, implying that satisfied employees are more likely to stay with the company.

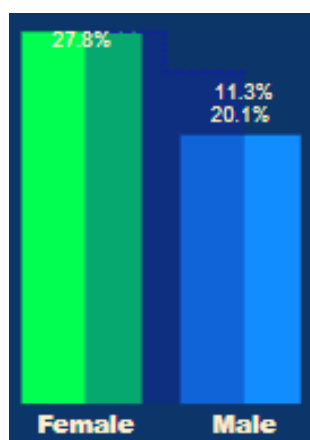


These findings align with the broader discussion on attrition, where factors such as age, overtime, industry experience, income, and job level were identified as significant influencers. However, the impact of these factors can vary across different departments and groups within the company, highlighting the complexity of attrition as a multifaceted issue.

6. GENDER AND ATTRITION

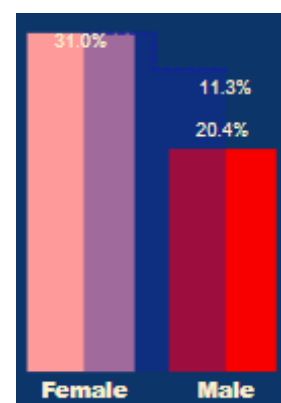
For employees under 30, the attrition rate for females (31.0%) is higher than for males (20.4%), suggesting that younger female employees are more likely to leave the company. However, for employees aged 30 to 40, the attrition rate for females (9.3%) is only slightly higher than for males (9.2%), indicating that gender does not significantly influence attrition in this age group. Interestingly, for employees aged 40 to 50, the attrition rate for males (4.7%) is higher than for females (3.4%).

The filters applied in this analysis are job level and age interval. When these filters are applied, we observe some changes in attrition rates by gender:



Job Level: When the job level filter is applied, the attrition rate for men slightly decreases compared to women. This suggests that at job level 1, women are more likely to leave the company than men. This could be due to various factors such as career development opportunities, work-life balance, or workplace culture that might differ by gender even within the same job level.

Age Interval: When the age interval filter of less than 30 is applied, the attrition rate for men decreases while the attrition rate for women stays the same. This suggests that younger women are slightly more likely to leave the company compared to younger men, and this trend persists even when other factors are controlled for.



Suggestions and Conclusion

In the context of reducing attrition, strategies surrounding factors such as age, job level, and job satisfaction could be created. Younger employees might benefit from career development and mentorship opportunities. A review of overtime policies could be useful to prevent dissatisfaction and burnout, and a fair distribution of workload could be ensured. Fair pay, particularly for lower-income groups, could enhance job satisfaction. Regular reviews of salary structures to align with industry standards might be beneficial. Tailored interventions could be developed to tackle challenges in high-attrition departments like Cardiology. Clear career advancement paths and skill development opportunities could be emphasized. Attrition spikes around the 4-year mark, potentially due to career stagnation, could be monitored and addressed. Job satisfaction could be improved through initiatives that consider the work environment, recognition, and professional growth opportunities. Key indicators like attrition rates and job satisfaction scores could be regularly monitored, and strategies adjusted based on data analysis and employee feedback. Gender-specific attrition patterns, particularly among younger female employees and older male employees in the 40 to 50 age group, could be addressed. Employee engagement programs could be enhanced to foster a positive work culture. Employee feedback could be solicited through surveys or focus groups to identify areas for improvement. Communication channels could be improved to keep employees informed about company initiatives, changes, and opportunities. A transparent communication culture could be fostered to build trust. Training and development programs could be invested in to upskill employees. Their expertise could be aligned with the company's evolving needs. Resources for continuous learning and growth could be provided to further contribute to employee retention.