

HR Analytics: Employee Attrition Analysis

Understanding and mitigating workforce turnover for a stronger organization.



Project Goals & Approach

1 Identify Key Factors

Uncover primary drivers behind employee attrition.

2 Data-Driven Insights

Provide actionable intelligence for HR teams.

3 Enhance Retention

Support strategies to improve workforce stability.



Integrated Toolset

Leveraging Python for data processing, PostgreSQL for structured analysis, and Power BI for interactive visualizations.

Dataset Snapshot

Employee Records

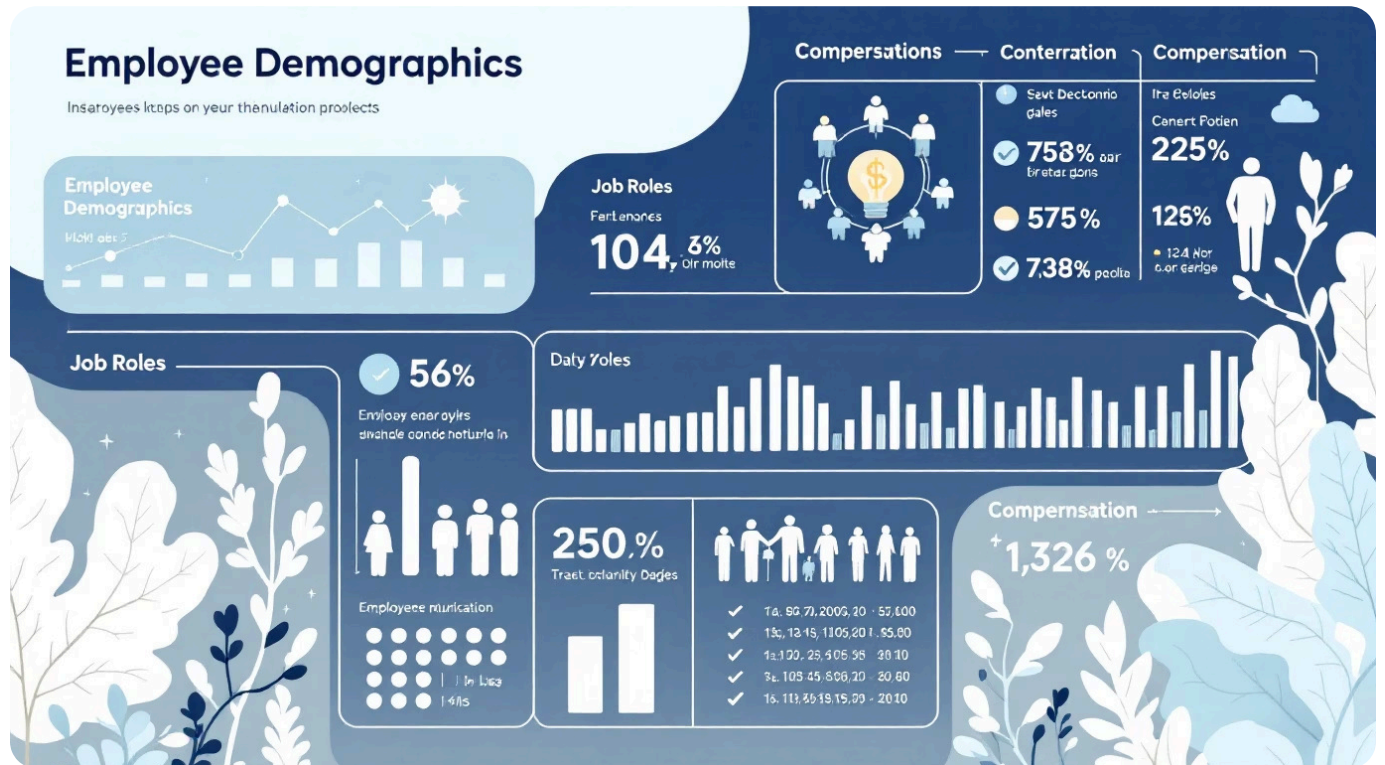
1,470 employee rows, 30+ features analyzed.

Key Variables

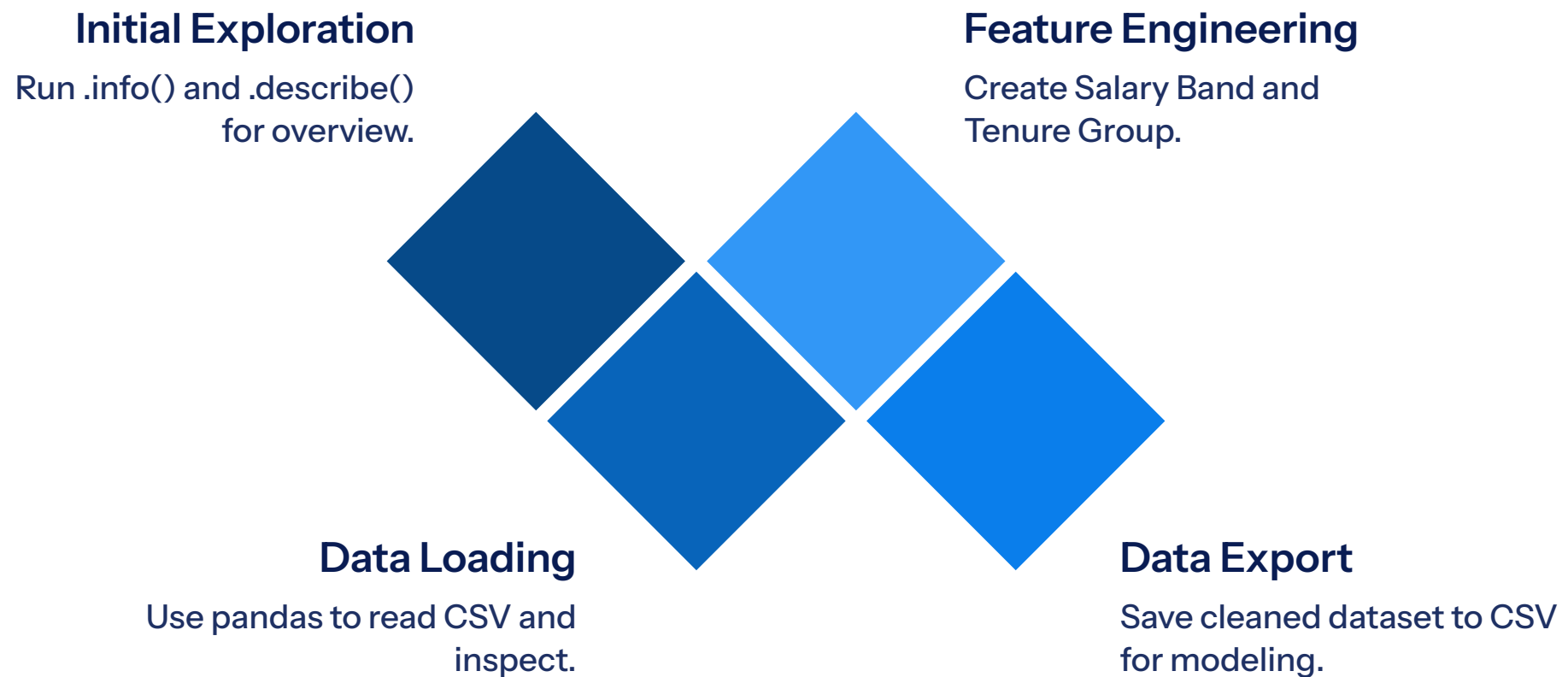
Demographics, job details, compensation, experience, work patterns.

Clean Data

No major missing values after rigorous cleaning.



Exploratory Data Analysis (EDA) with Python



Data Loading & Inspection

Pandas for data loading; `.info()` and `.describe()` for initial structure and statistics.

Feature Engineering

Created 'Salary Band' (Low/Medium/High) and 'Tenure Group' (0-2, 3-5, 6-10, 10+ years).

Data Cleansing

Removed irrelevant columns; converted 'Attrition' to numeric (1=Left, 0=Stayed).

Consistency & Export

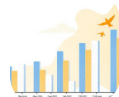
Ensured data consistency, checked null values, exported to PostgreSQL.

Key Attrition Questions Answered



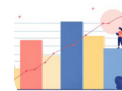
Overall Attrition Rate

What percentage of employees leave?



Departmental Risk

Which departments experience the highest turnover?



Overtime Impact

Does working overtime correlate with higher attrition?



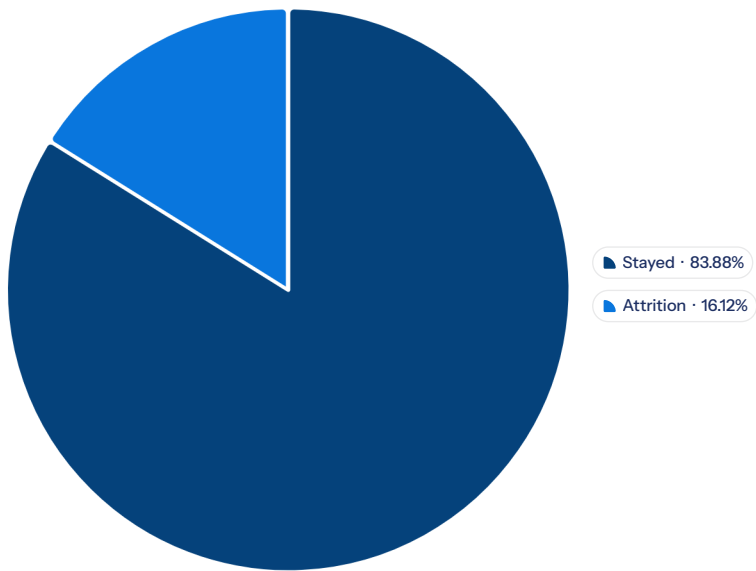
Salary Band Attrition

Which salary bands face the highest attrition rates?

Key Attrition Answers Visualized

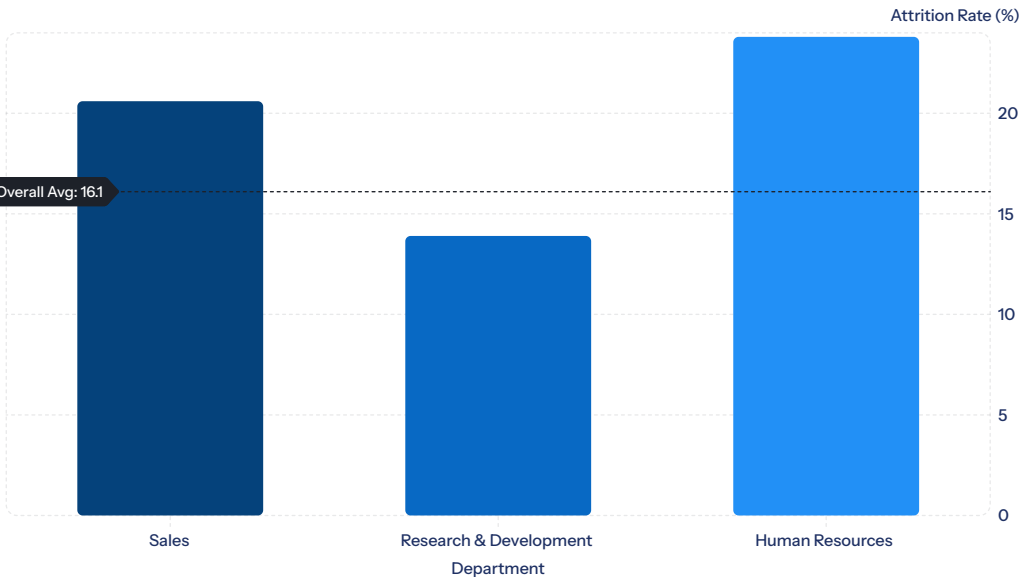
Here are the data-driven answers to our core attrition questions, visualized for clarity:

Overall Attrition Rate



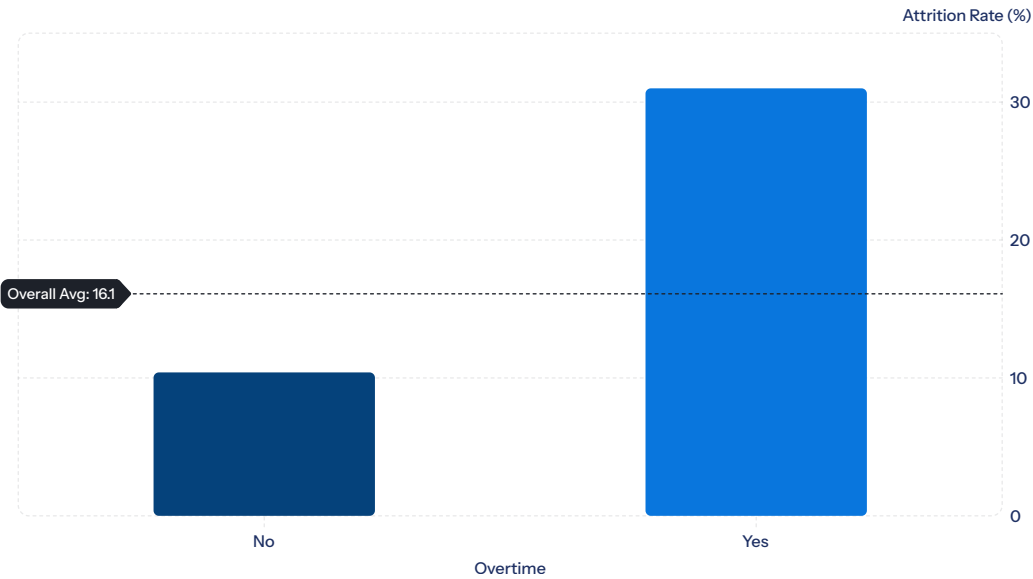
Approximately **16.1%** of employees have left the company, indicating a significant turnover challenge.

Attrition by Department



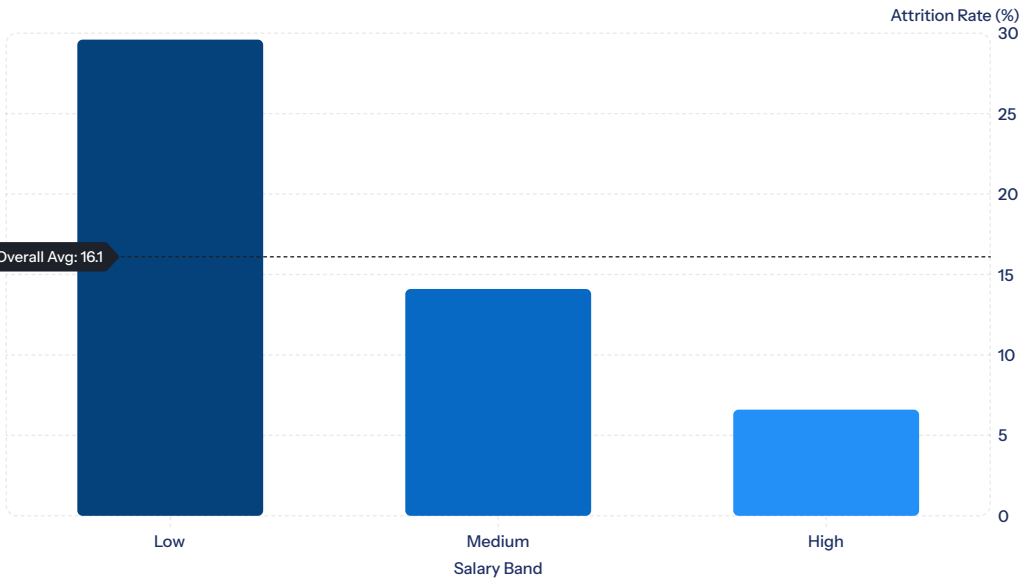
Human Resources and Sales departments show higher attrition rates compared to Research & Development, with HR notably above the company average.

Impact of Overtime on Attrition



Employees working overtime experience a significantly higher attrition rate (**31.0%**) compared to those who do not.

Attrition by Salary Band



The lowest salary band has a substantially higher attrition rate (**29.6%**), suggesting potential issues with compensation or perceived value.

Deeper Dives into Attrition Factors



Tenure's Influence

How does years at the company affect attrition?



High-Risk Job Roles

Identifying specific roles with elevated turnover.



Gender Differences

Are there significant gender-based attrition patterns?



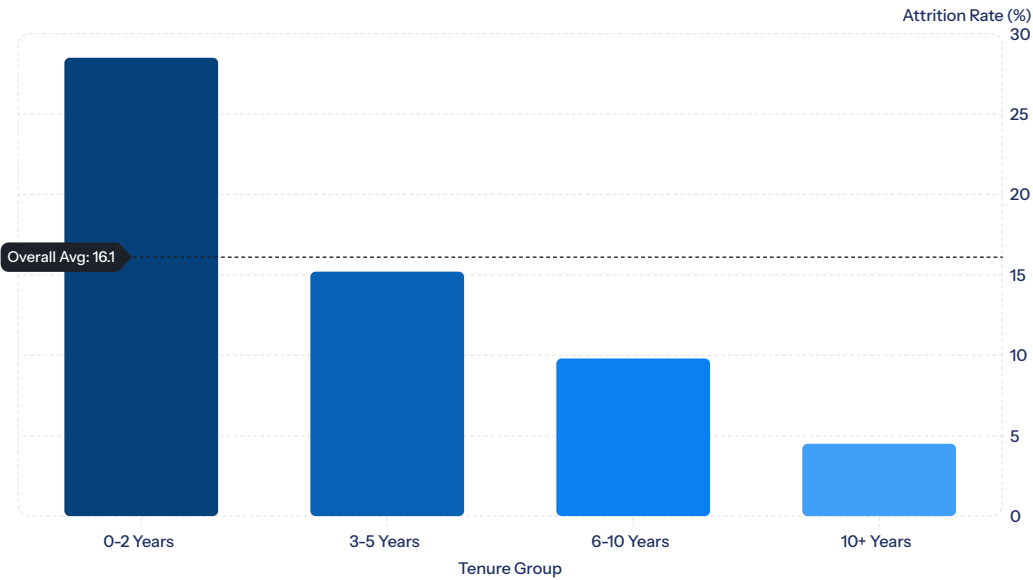
Marital Status Effect

Does marital status play a role in employee retention?

Additional Attrition Insights from SQL

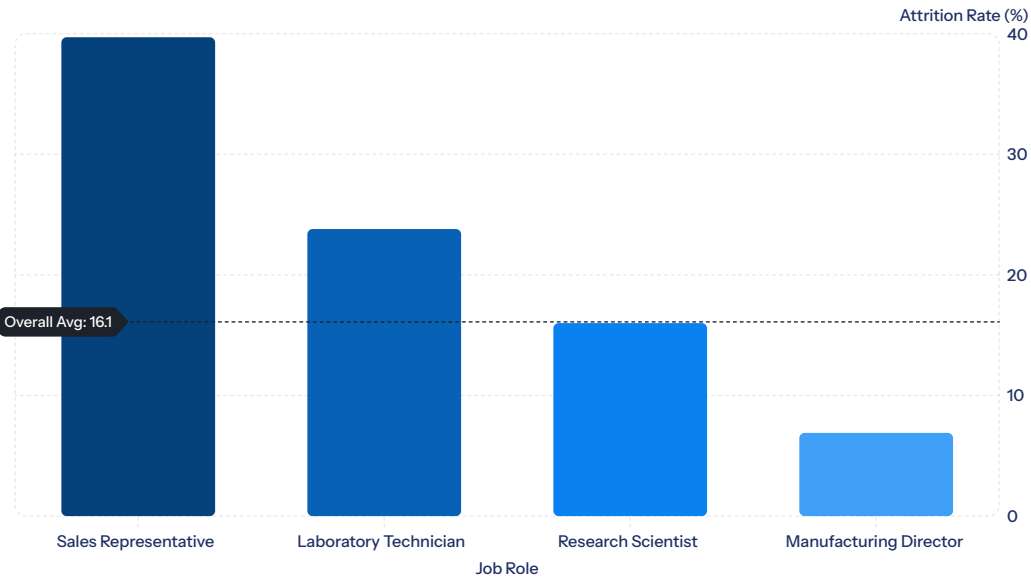
Further analysis reveals how factors like tenure, job role, gender, and marital status influence employee attrition, providing targeted areas for intervention.

Attrition by Tenure Group



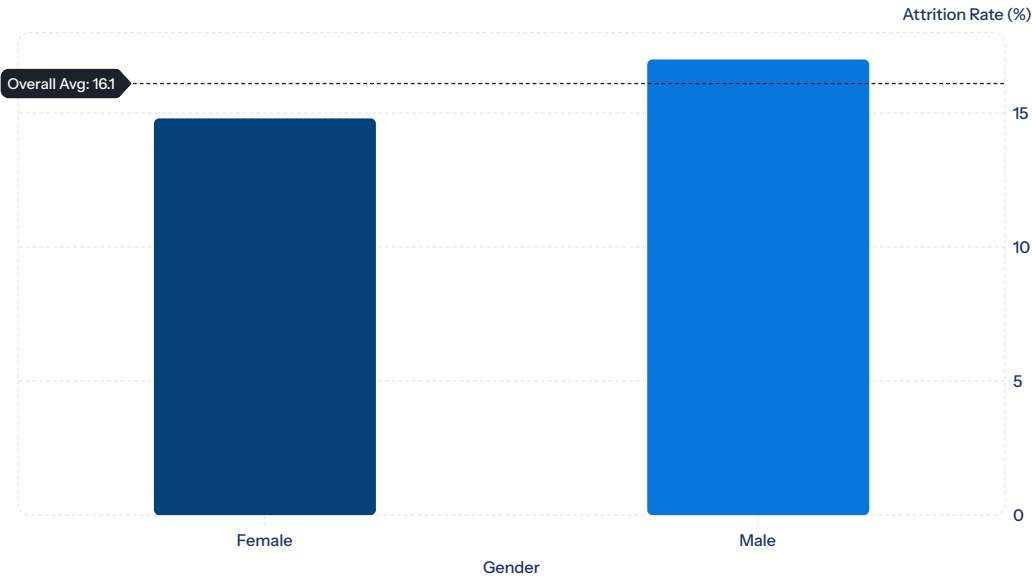
Newer employees (0-2 years) exhibit the highest attrition rate at **28.5%**, significantly above the company average, highlighting early career challenges.

Attrition by Job Role



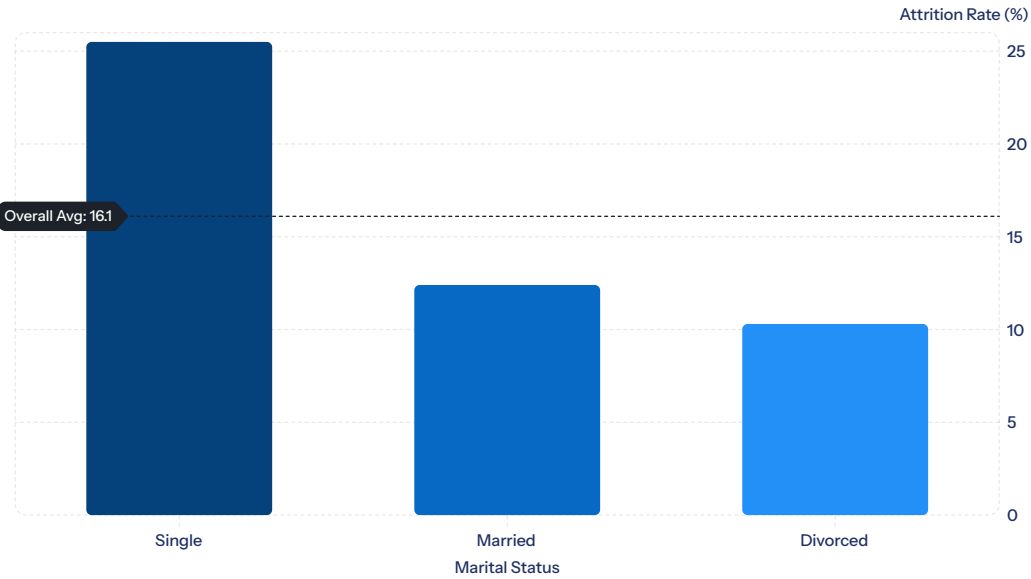
Sales Representatives face a strikingly high attrition rate of **39.7%**, indicating a critical area for retention focus within this role.

Attrition by Gender



There is a slight difference in attrition rates, with male employees having a marginally higher rate of **17.0%** compared to female employees.

Attrition by Marital Status



Single employees show a significantly higher attrition rate of **25.5%**, suggesting that life stage and support systems may play a role in retention.

Interactive Dashboard in Power BI

Dynamic KPIs

- Total Employees, Employees Left
- Attrition Rate (%), Average Salary
- Average Years at Company

Key Visualizations

- Attrition by Department & Salary Band
- Overtime vs Attrition, Attrition by Tenure Group
- Attrition by Job Role

Interactive Features

Slicers for Department, Gender, Salary Band, Job Role to filter and analyze high-risk segments dynamically.

Employee Attrition Overview



1470

Total Employees

237

Employees Left

16.12%

Attrition Rate %

6.50K

Avg Salary

7.01

Avg Years at comp...

department

☒ Select all

☐ Human Resources

☐ Research & Devel...

☐ Sales

gender

☐ Female

☐ Male

jobrole

All

salary_band

☐ High

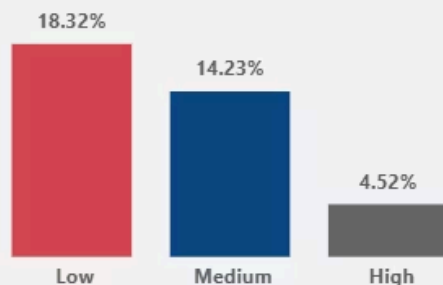
☐ Low

☐ Medium

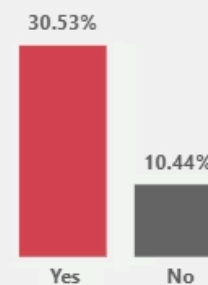
Attrition by department



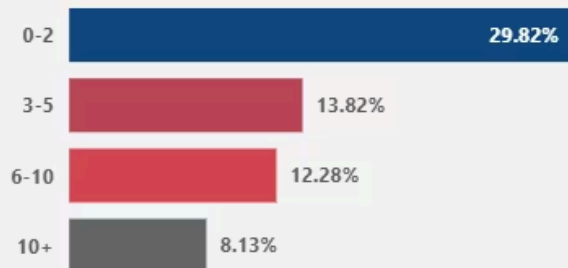
Attrition by salary_band



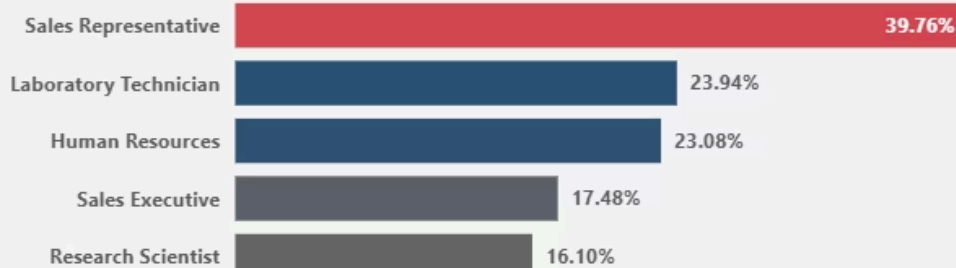
Attrition by overtime



Attrition by tenure_group



Attrition by jobrole



Key Insights from the Analysis

1 Compensation Disparity

Low Salary Band employees show significantly higher attrition.

2 Overtime Burnout

Employees working overtime are more prone to leaving the organization.

3 Departmental Vulnerabilities

The Sales department has the highest contribution to total attrition.

4 Promotion Stagnation

Lack of promotion for 3+ years correlates with increased exit rates.

5 Role-Specific Risks

Certain job roles consistently present high attrition risk.

Business Recommendations for Retention



Review Compensation

Improve structure for low-salary band employees.



Manage Overtime

Monitor workload to prevent burnout and fatigue.



Targeted Strategies

Develop specific retention plans for high-risk departments.



Promotion Policies

Implement regular review policies for long-stagnating employees.



Boost Engagement

Introduce development programs and foster career growth opportunities.