4 2020_Data_Role_Annual_Salary_Distribution_Analysis

2020_Data_Job_Titles: All

Company_Size: All

Employment_Type: All

Average_Salary
102.25K

Common_Salary
105K

Mid_Salary
79.83K

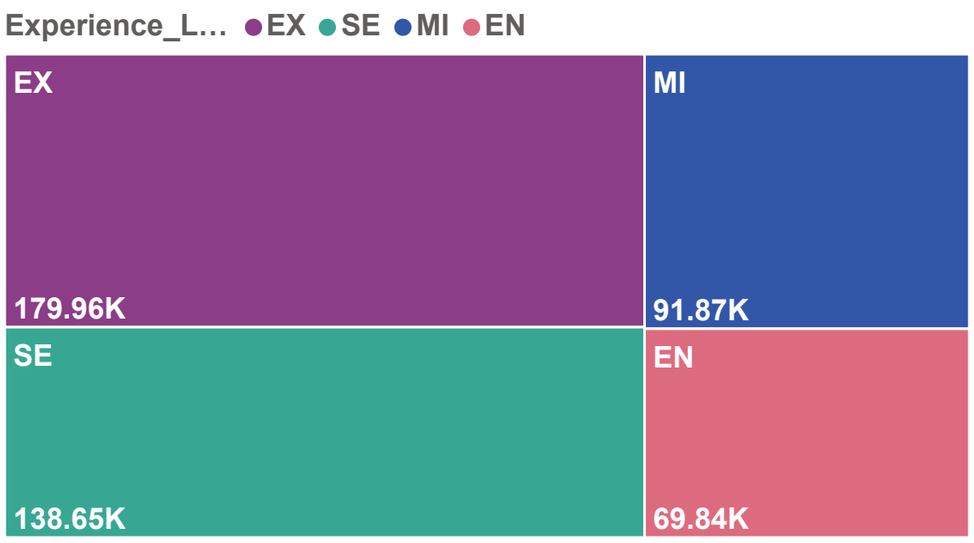
SD_Population
82.17K

Mean_Median_Gap
22.42K

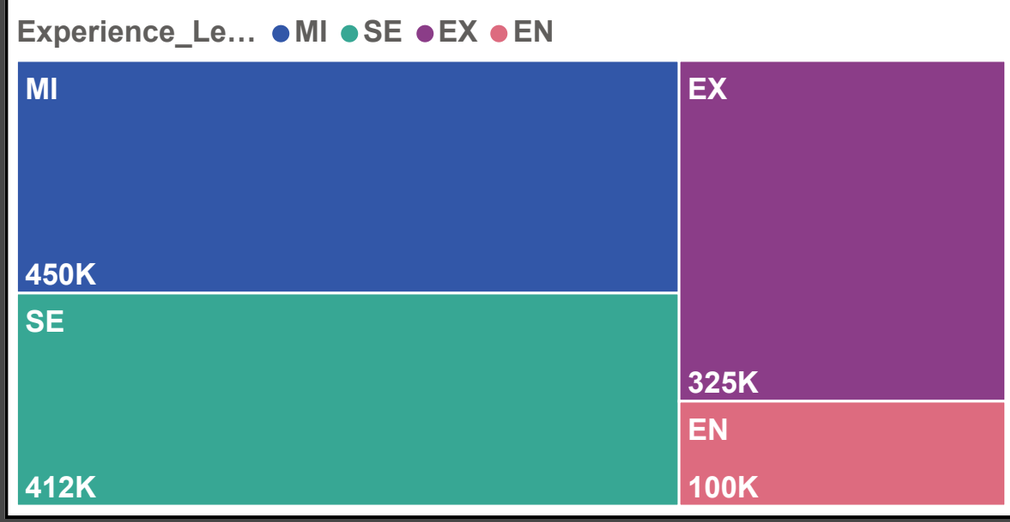
2020_Salary_Inequality_Flag
High Salary Inequality

2020_Salary_Distribution_Type
Strongly Right-Skewed (High inequality)

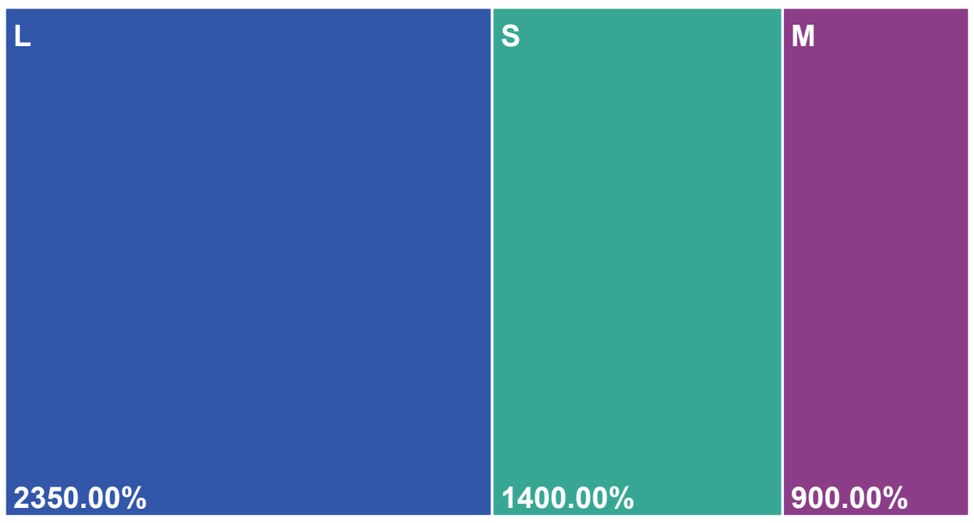
Average_Data_Role_2020_Annual_Salary_by_Experience_Level



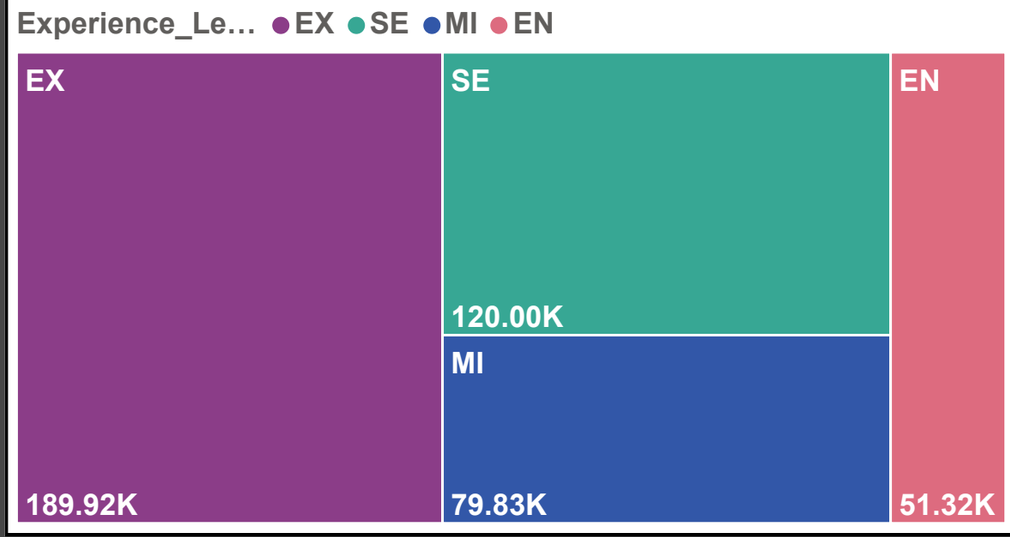
Most _Common_Data_Role_2020_Annual_Salary_by_Experience_Level



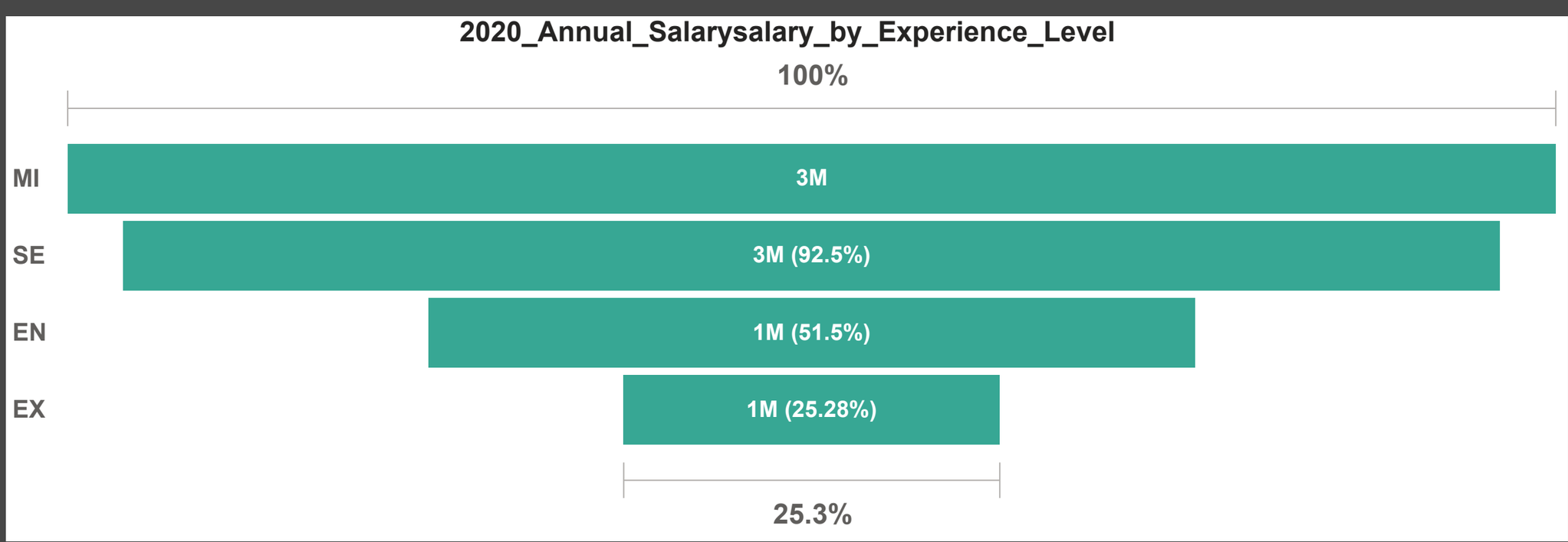
2020_Total_Remote_Ratio_by_Company_Size



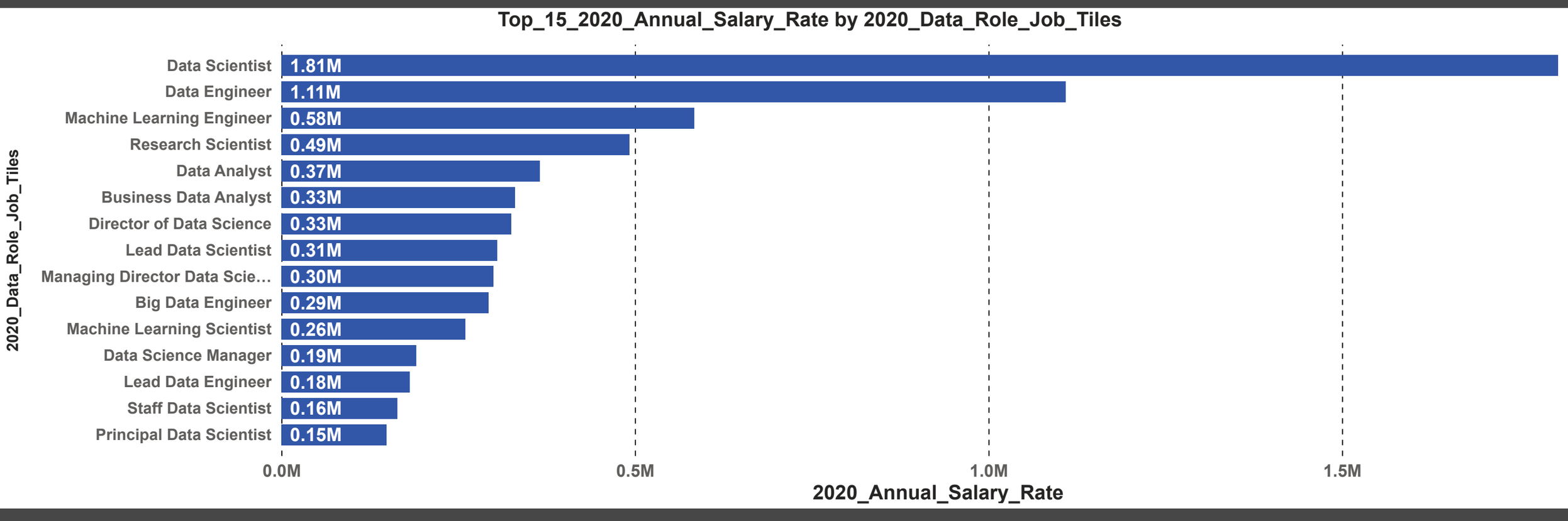
Mid_Level_Data_Role_2020_Annual_Salary_by_Experience_Level



2020_Annual_Salarysalary_by_Experience_Level



Top_15_2020_Annual_Salary_Rate by 2020_Data_Role_Job_Tiles



4 2021_Data_Role_Annual_Salary_Distribution_Analysis

2021_Data_Job_Titles	Company_Size	Experience_Level
All	All	All

Average_Salary
99.92K

Mid_Salary
83.87K

Common_Salary
150K

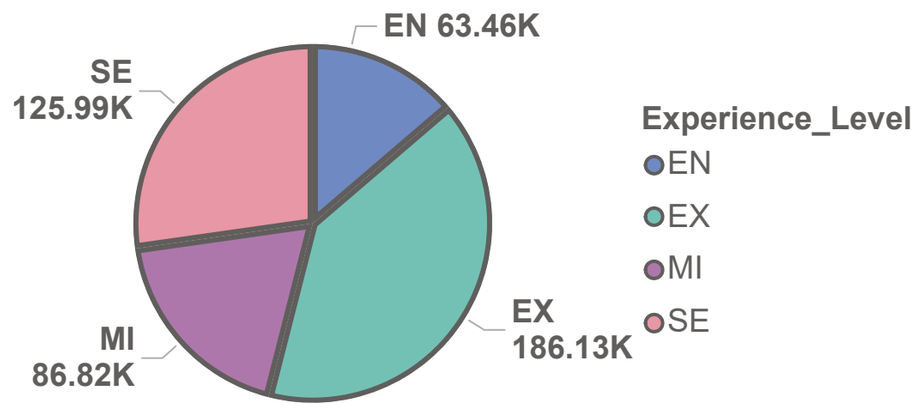
SD_Population
66.92K

Mean_Median_Gap
16.05K

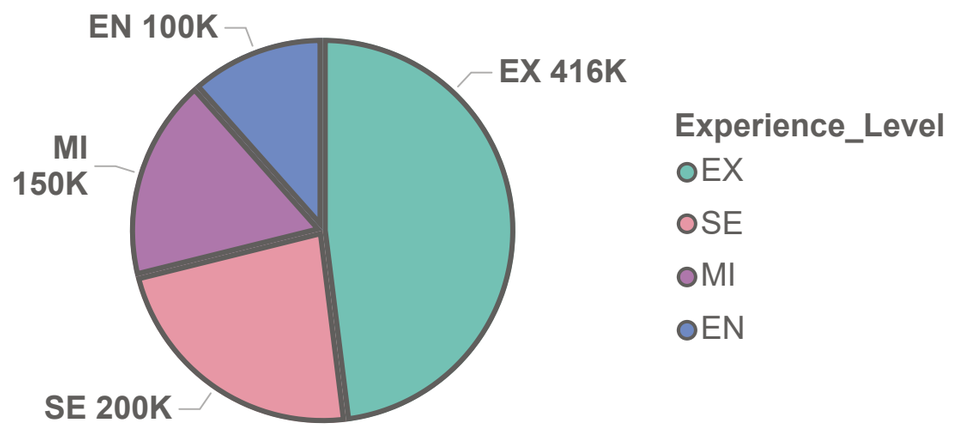
2021_Salary_Inequality_Flag
High Salary Inequality

2021_Salary_Distribution_Type
Strongly Right-Skewed (High inequality)

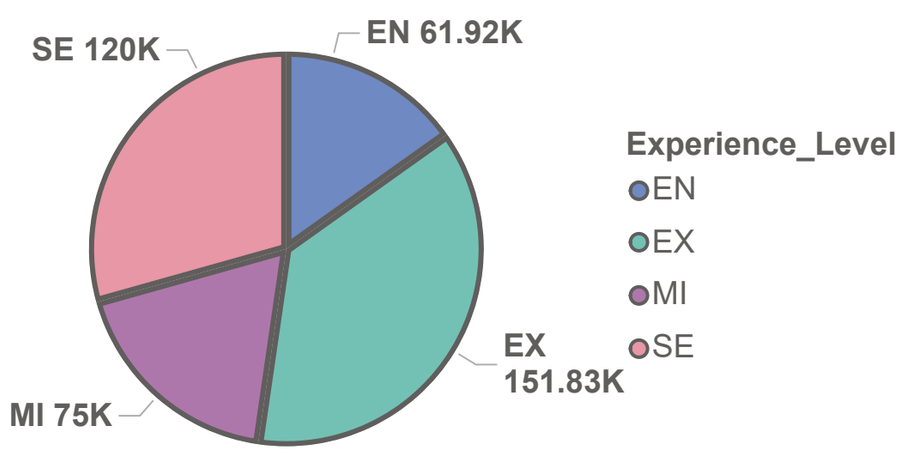
Average_Data_Role_2021_Annual_Salary_by_Experience_Level



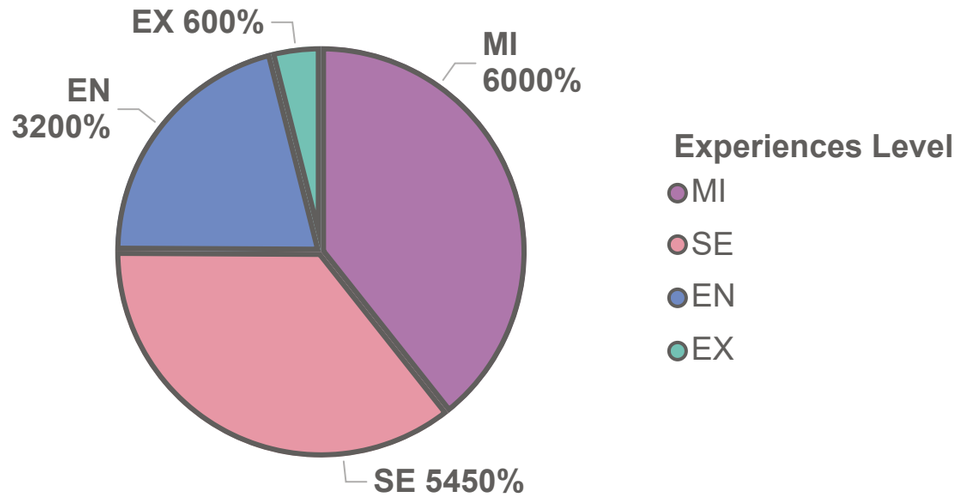
Most_Common_2021_Annual_Salary_by_Experience_Level



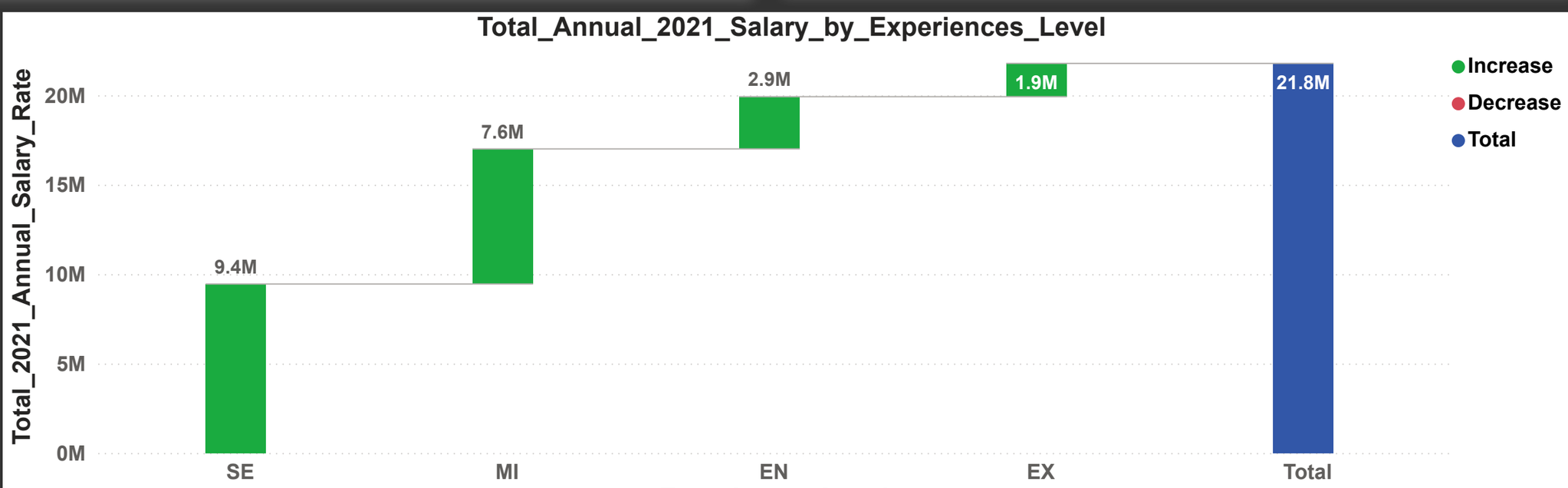
Mid_Level_Data_Role_2021_Annual_Salary_by_Experience_Level



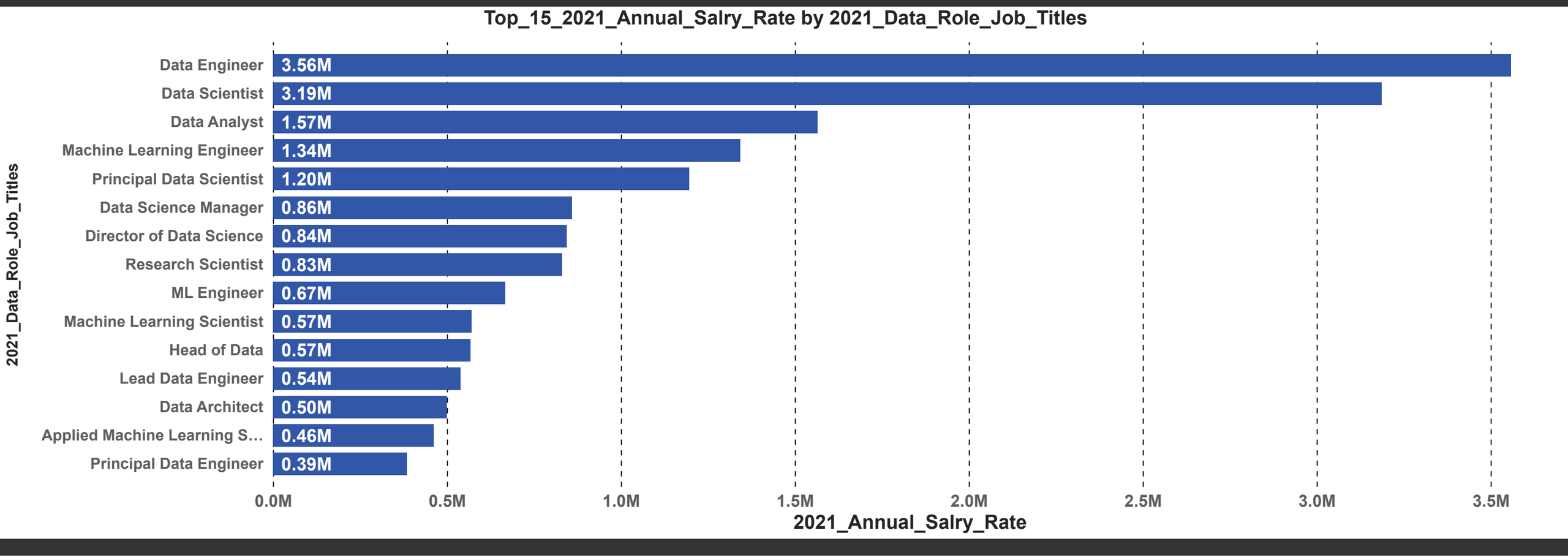
2021_Total_Remote_Ratio_by_Experiences_Level



Total_Annual_2021_Salary_by_Experiences_Level



Top_15_2021_Annual_Salry_Rate by 2021_Data_Role_Job_Titles



4 2022_Data_Role_Salary_Distribution_Analysis

2022_Data_Job_Titles: All | Company Size: All | Employment_Type: All

Average_Salary 102.25K

Common_Salary 105K

Mid__Salary 79.83K

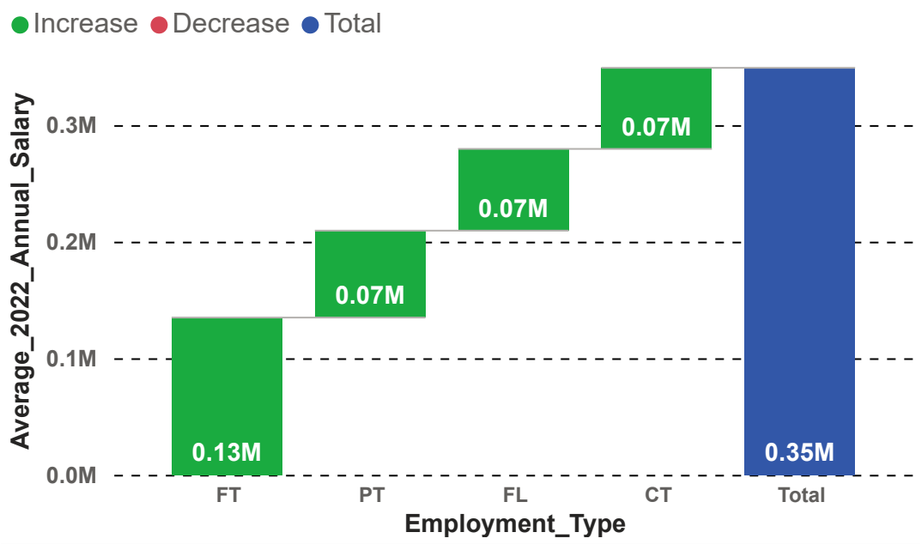
SD_Population 82.17K

Mean_Median_Gap 22.42K

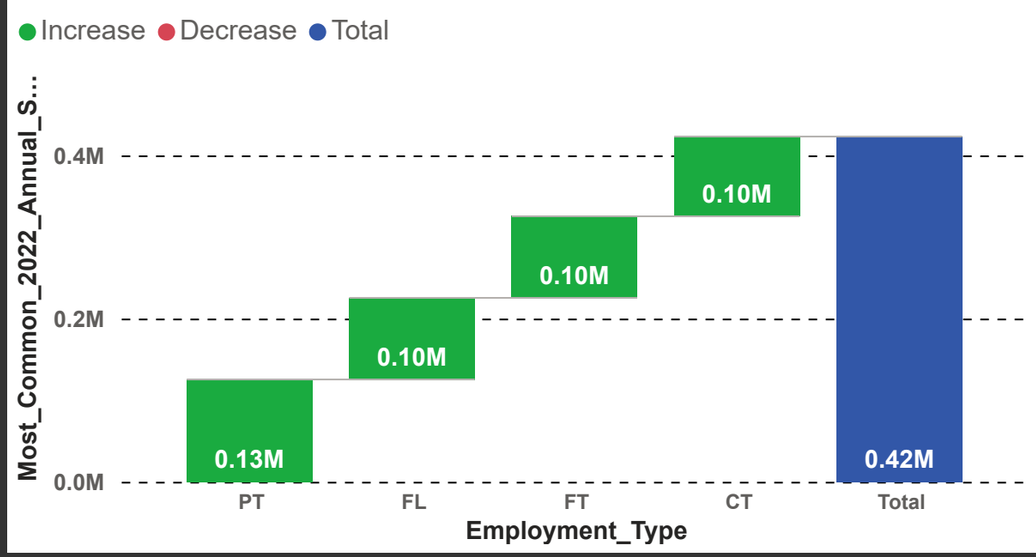
2022_Salary_Distribution_Type
Moderately Right-Skewed

2022_Salary_Inequality_Flag
Moderate/Low Salary Inequality

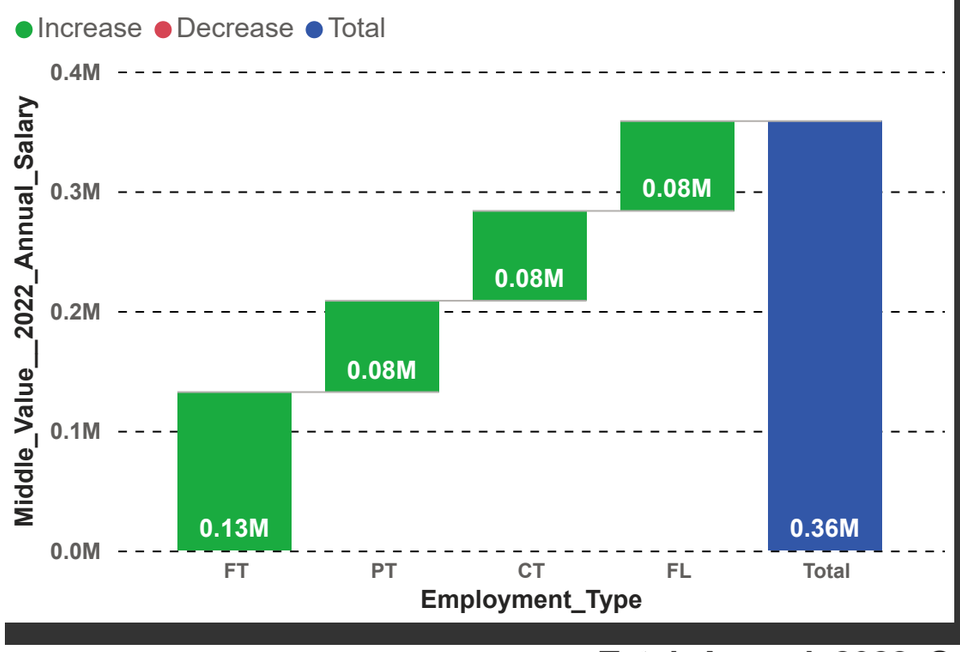
Average_Data_Role_2022_Annual_Salary_by_Employment_Type



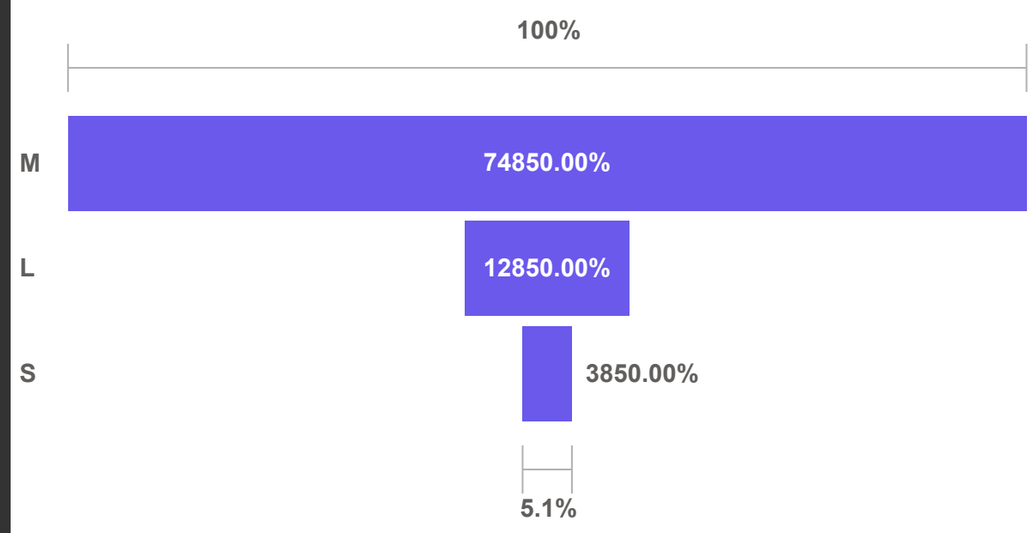
Most_Common_Data_Role_2022_Annual_Salary_by_Employment_Type



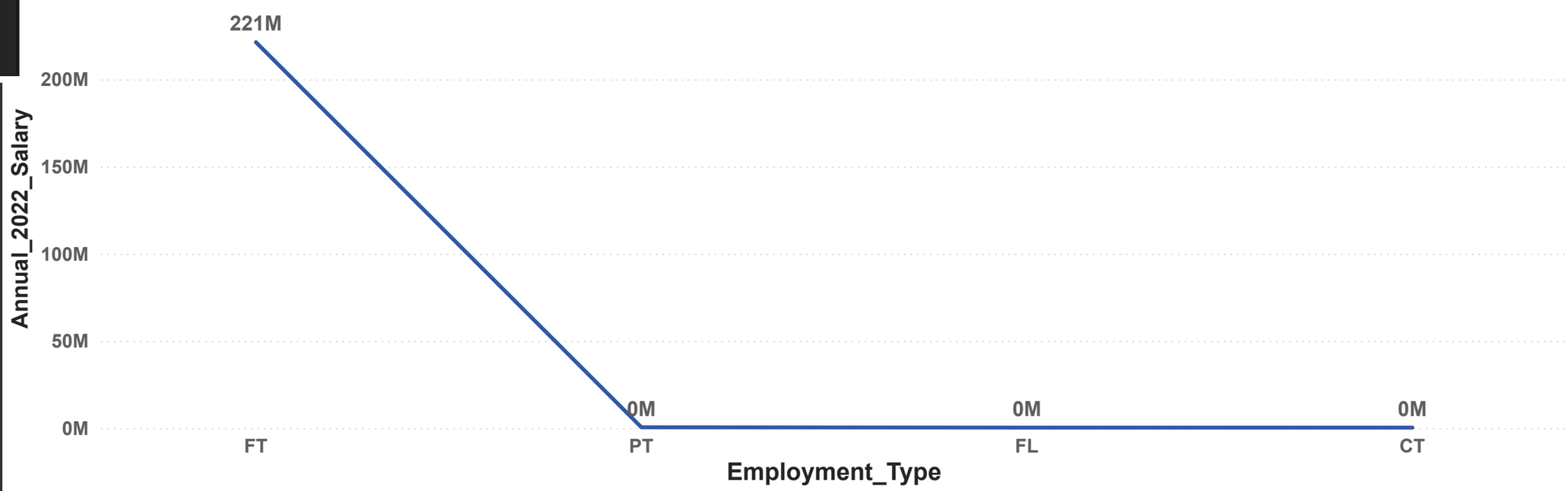
Mid_Value_Data_Role_2022_Annual_Salary_by_Employment_Type



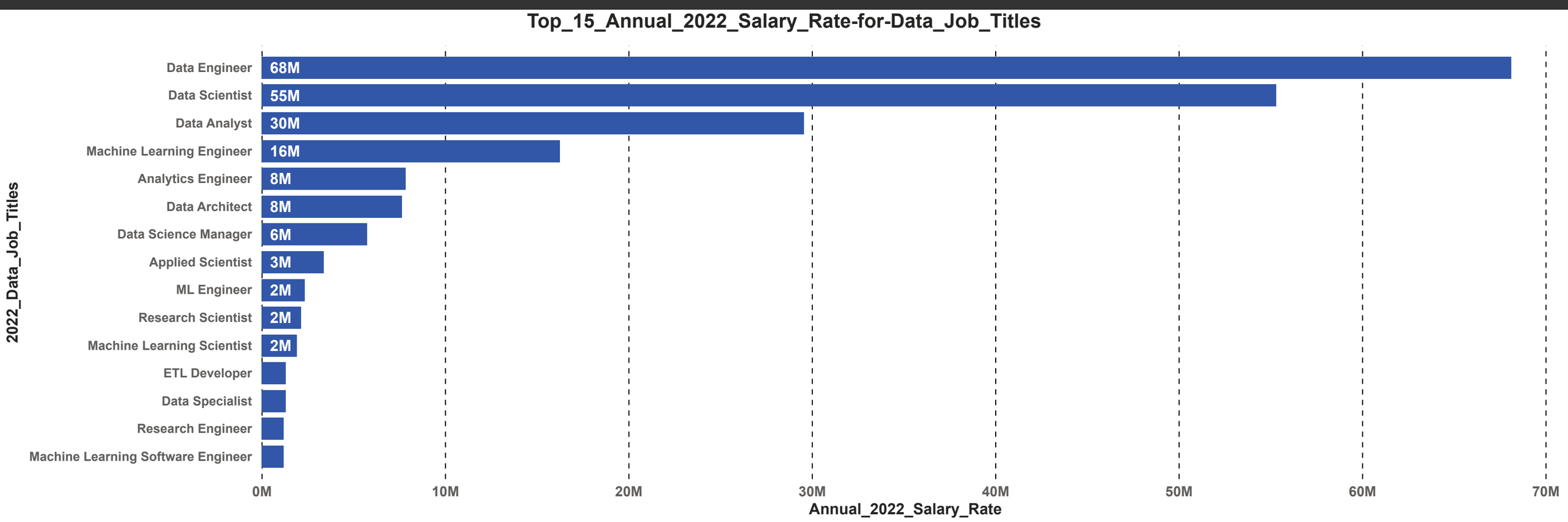
2022_Total_Remote_Ratio_by_Company_Size



Total_Annual_2022_Salary_by_Employment_Type



Top_15_Annual_2022_Salary_Rate-for-Data_Job_Titles



4 2023_Data_Role_Salary_Distribution_Analysis

2023_Data_Job_Titles: All

Company_Size: All

Employment Type: All

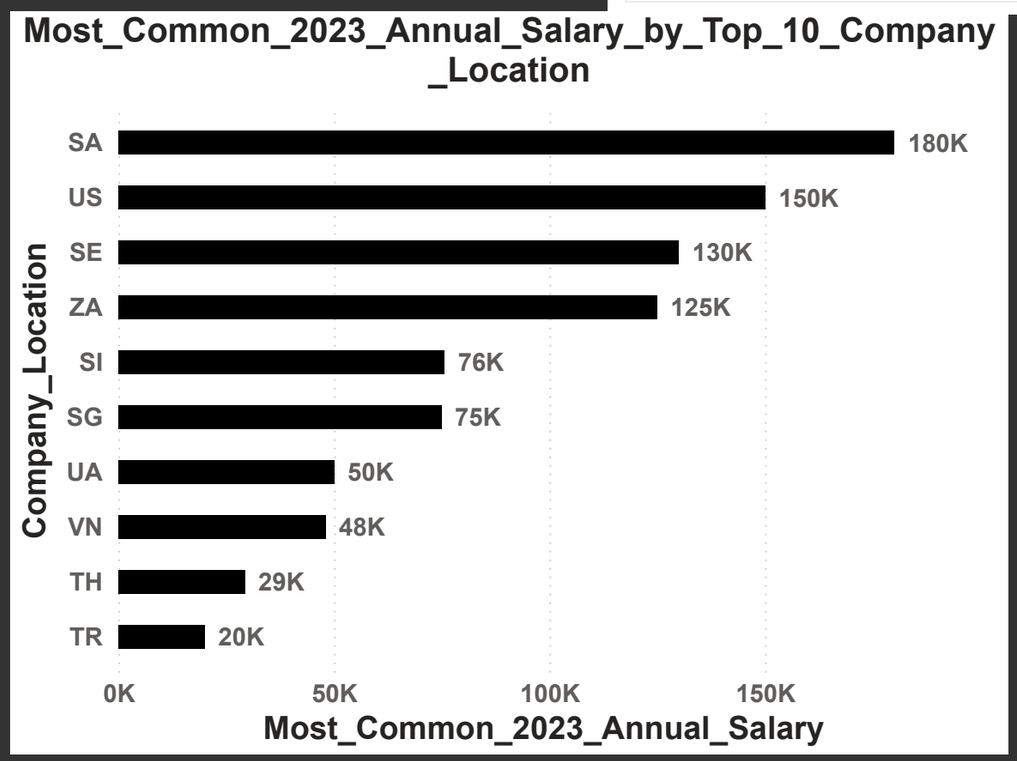
Average_Salary
153.73K

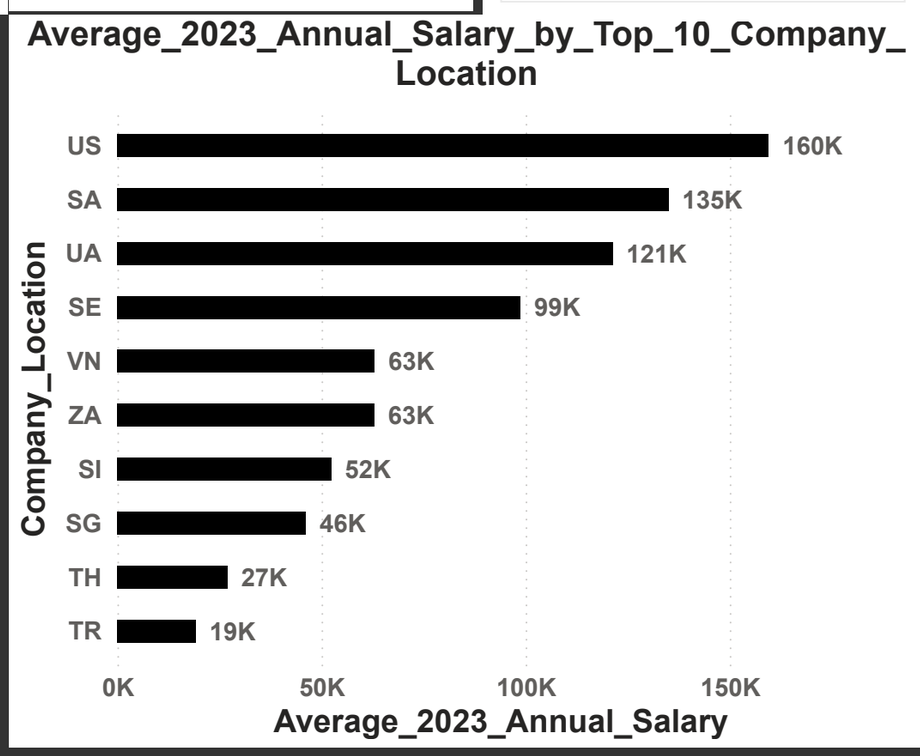
Common_Salary
150K

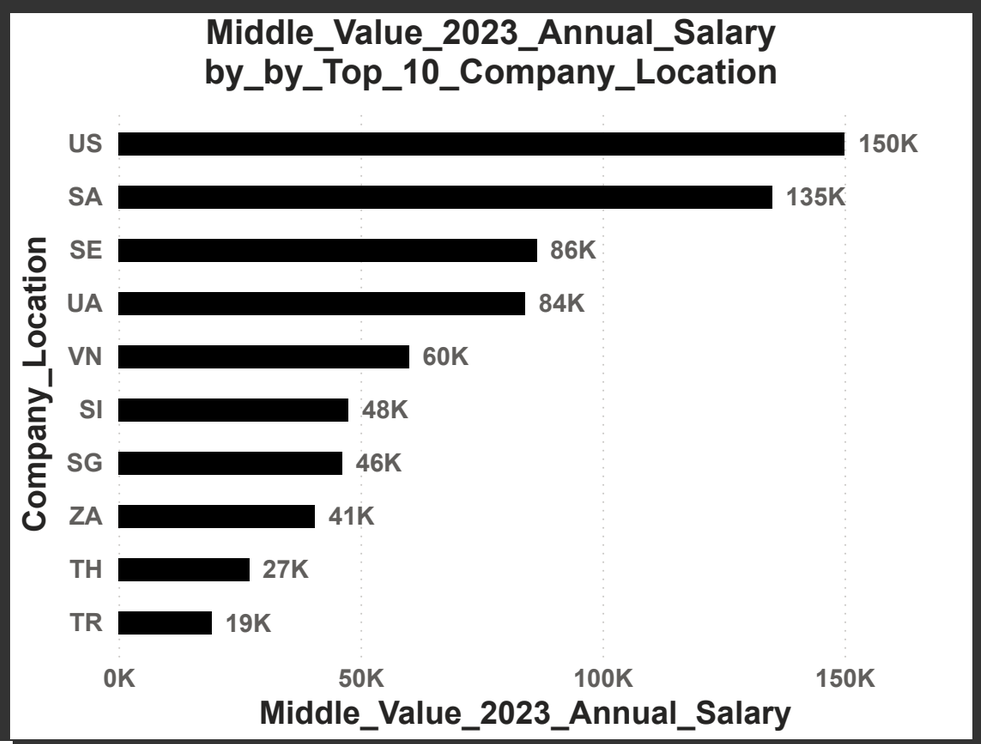
Mid_Salary
145.00K

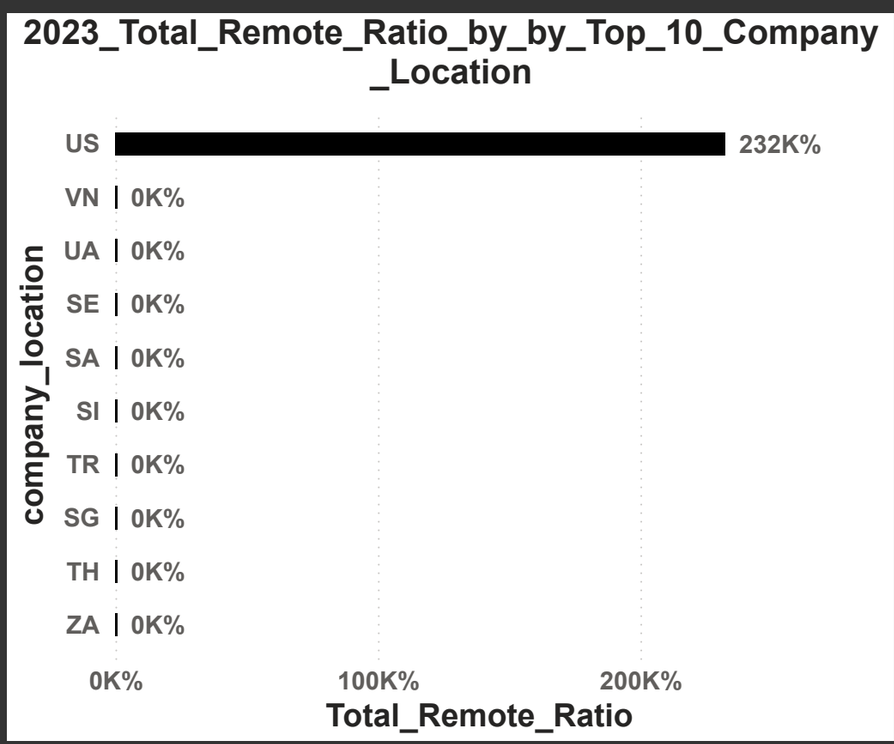
SD_Population
73.69K

Mean_Median_Gap
8.73K



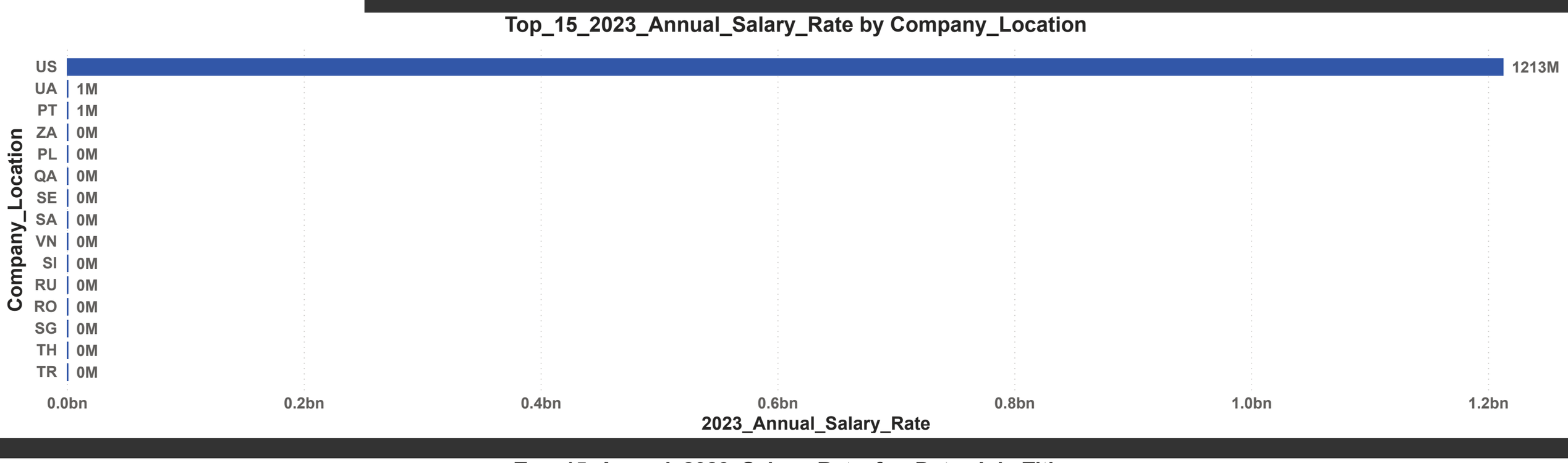


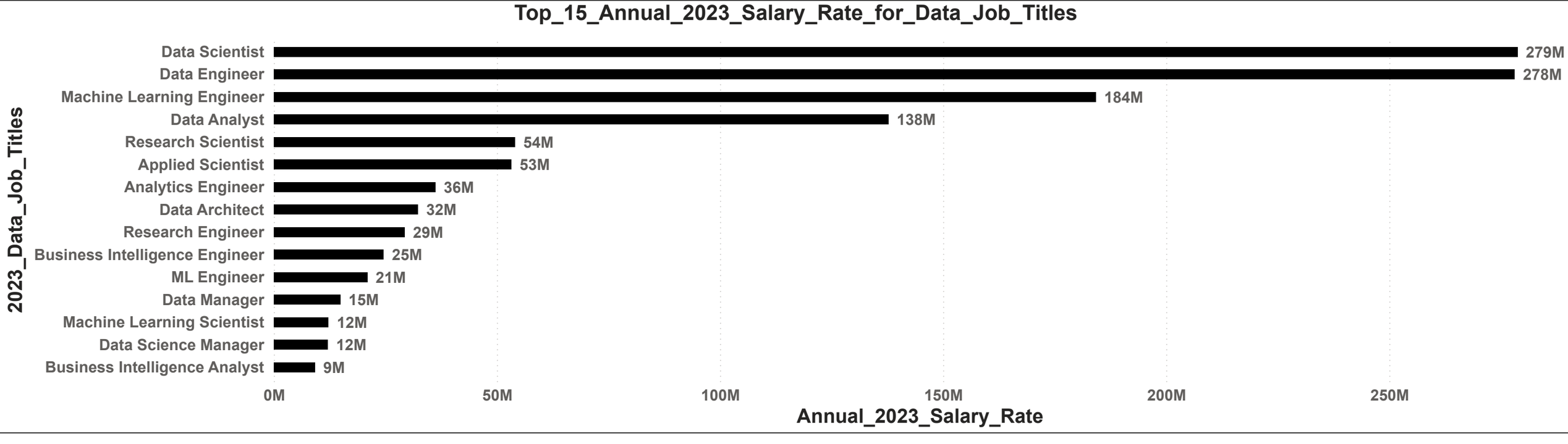




2023_Salary_Inequality_Flag
Moderate/Low Salary Inequality

2023_Salary_Distribution_Type
Moderately Right-Skewed





4 2024_Data_Role_Salary_Distribution_Analysis

2024_Data_Job_Titles: All

Company_Size: All

Employment_Type: All

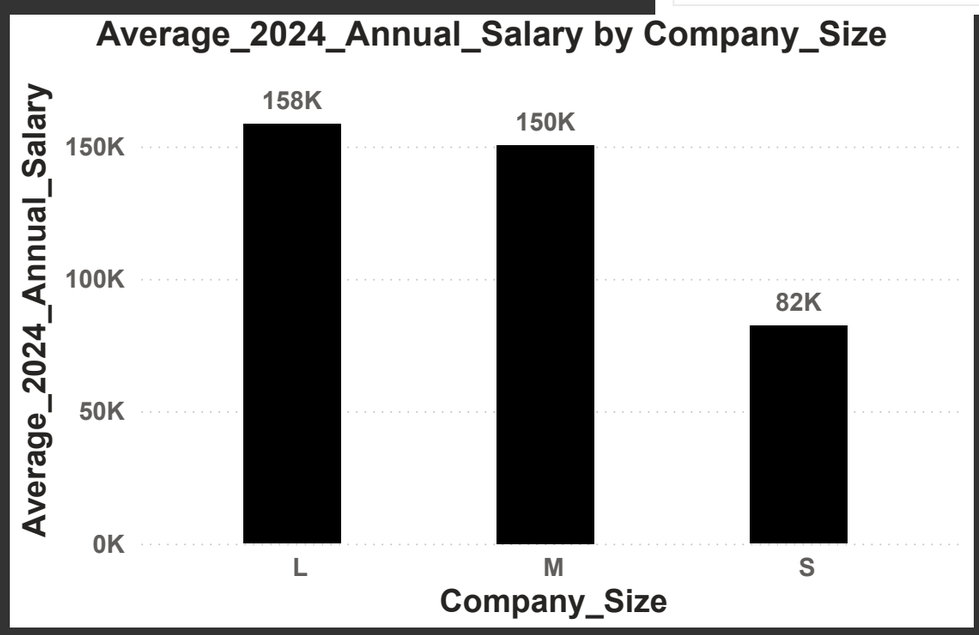
Average_Salary: 150.56K

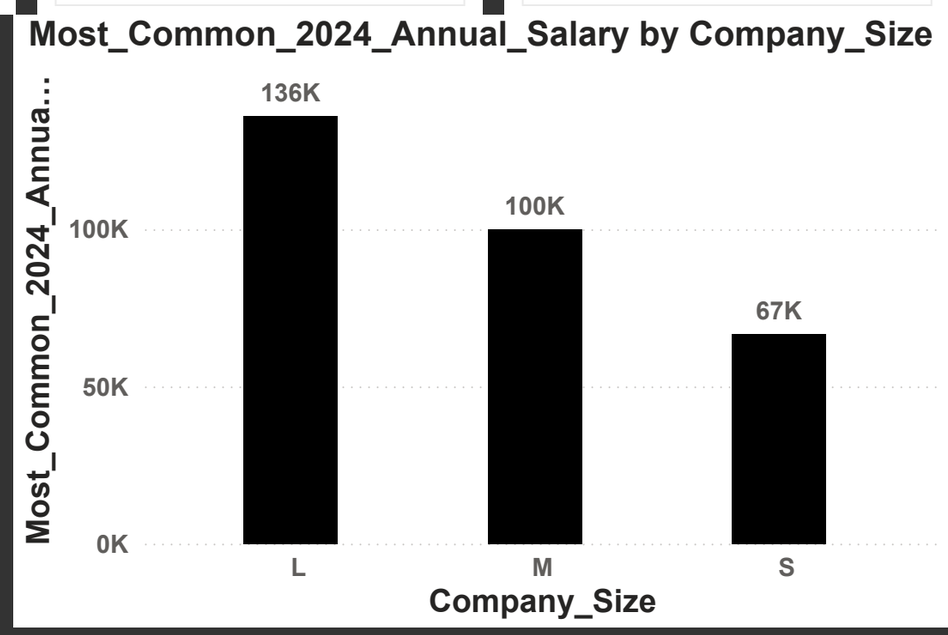
Common_Salary: 100K

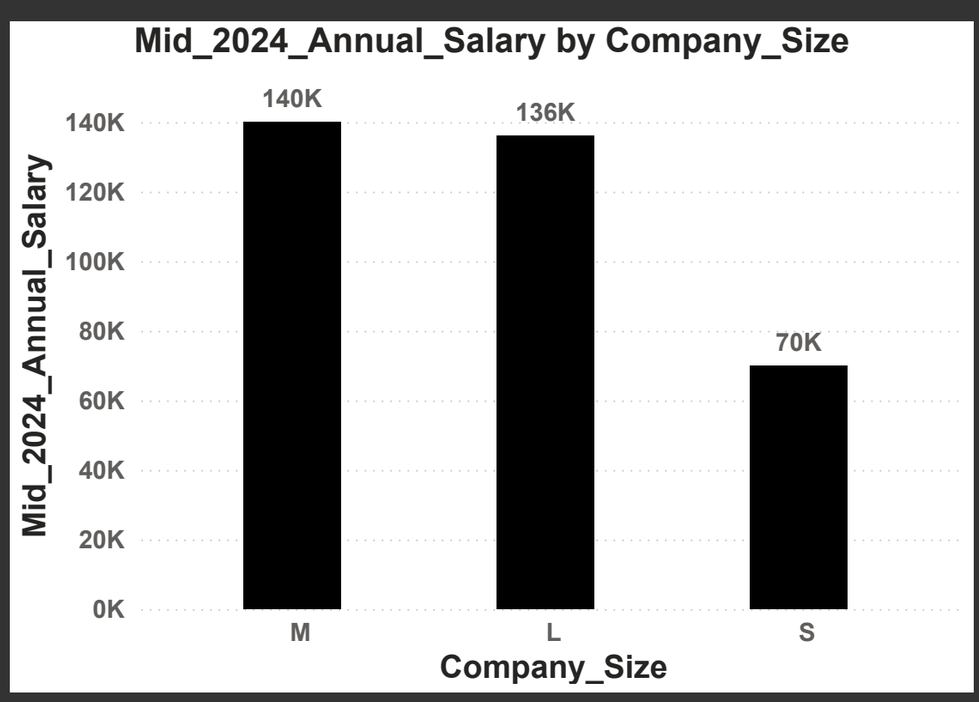
Mid_Salary: 140.00K

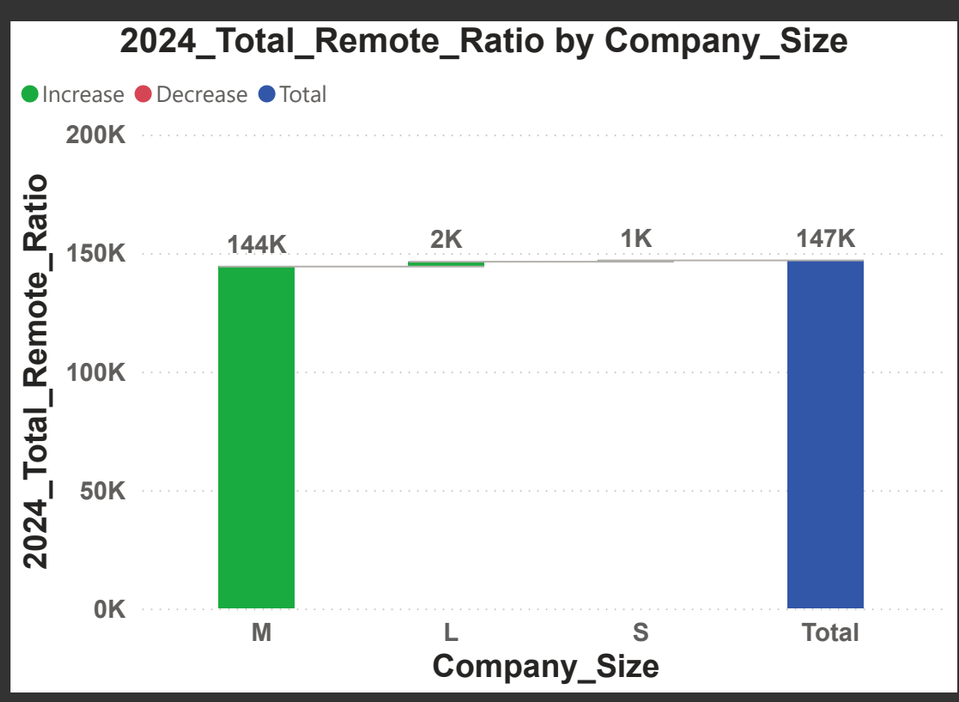
SD_Population: 73.69K

Mean_Median_Gap: 10.56K







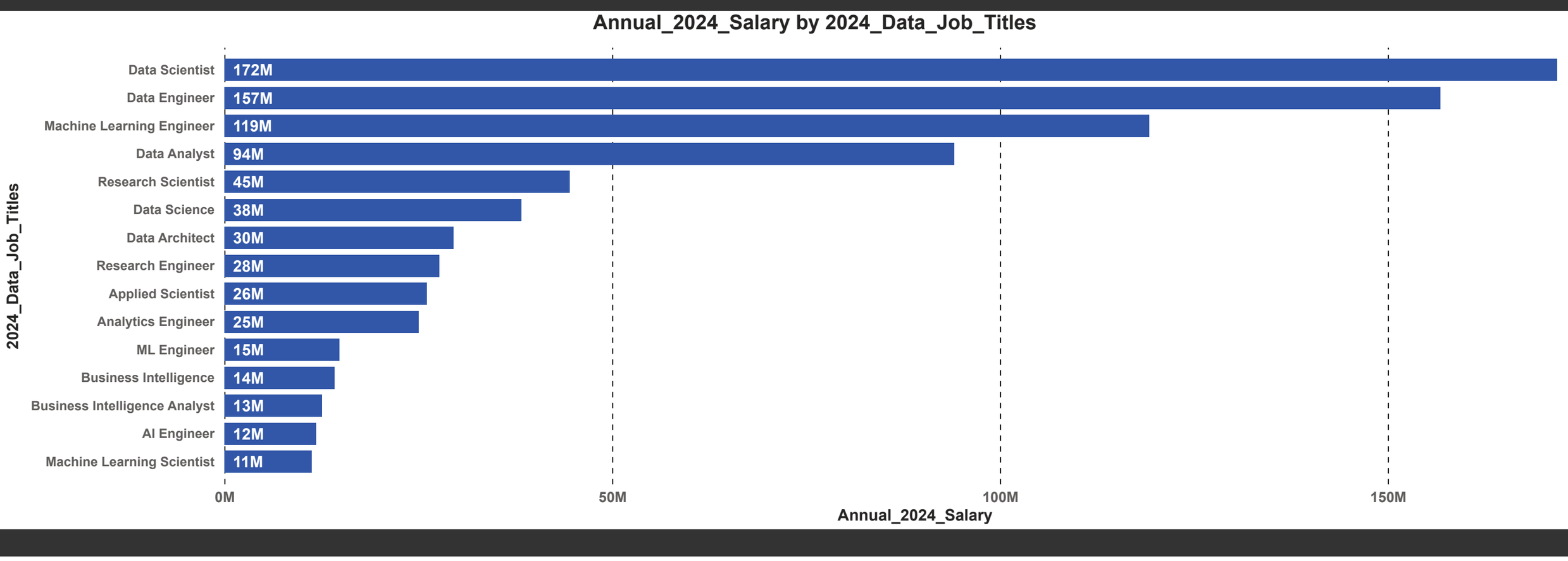


2024_Salary_Inequality_Flag

Moderate/Low Salary Inequality

2024_Salary_Distribution_Type

Moderately Right-Skewed



4 2020_2024_Data_Role_Salary_Distribution_Analysis

Average_Salary	150K
Common_Salary	150K
Mid_Salary	141.30K
SD_Population	68.50K
Mean_Median_Gap	8.39K

Percentile_Salary_in_usd_90%	235.00K
Q1_Quartiles_25%_of_Dataset	101.13K
Q3_Quartiles_75%_of_Dataset	185.90K
Q2_Quartiles_50%_of_Dataset	141.30K

2020_2024_Salary_Distribution_Type
Moderately Right-Skewed

2020_2024_Salary_Inequality_Flag
Moderate/Low Salary Inequality

2020

Max_Annual_Salary	Min_Annual_Salary	Range_Annual_Salary	Outlier_Detecting
450K	15K	435K	--

2021

Max_Annual_Salary	Min_Annual_Salary	Range_Annual_Salary	Outlier_Detecting
423K	15K	408K	--

2022

Max_Annual_Salary	Min_Annual_Salary	Range_Annual_Salary	Outlier_Detecting
431K	15K	416K	--

2023

Max_Annual_Salary	Min_Annual_Salary	Range_Annual_Salary	Outlier_Detecting
750K	16K	734K	--

2024

Max_Annual_Salary	Min_Annual_Salary	Range_Annual_Salary	Outlier_Detecting
800K	17K	783K	--

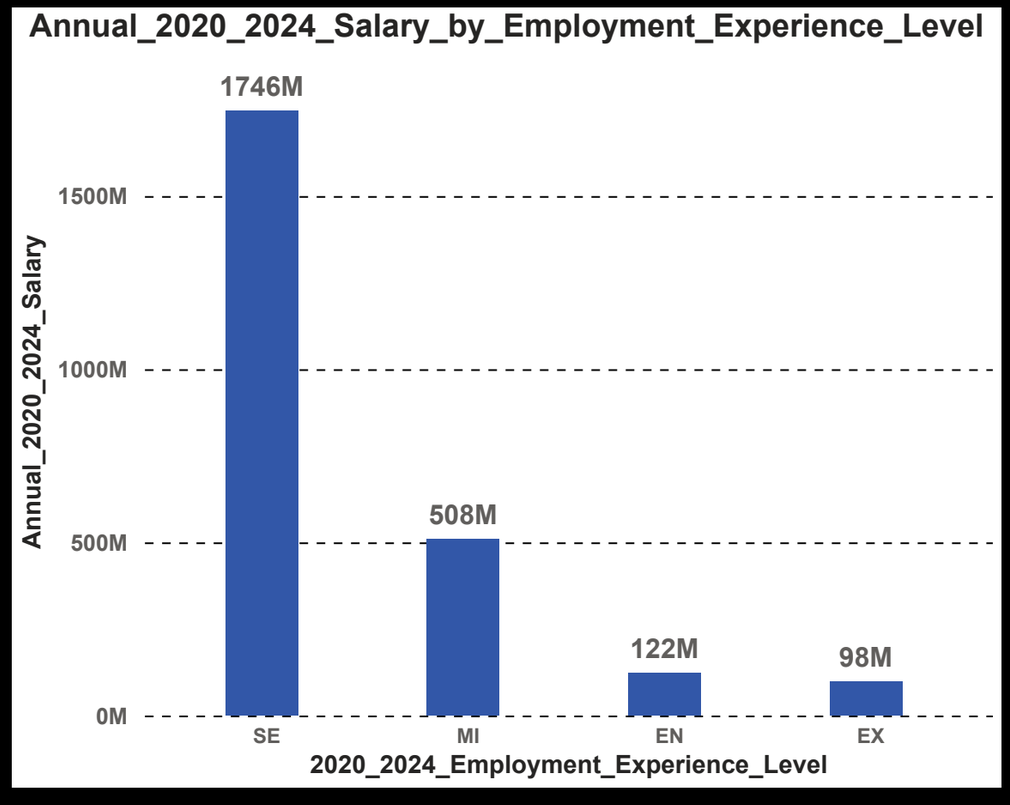
5_Years_Annual_Salary_Range

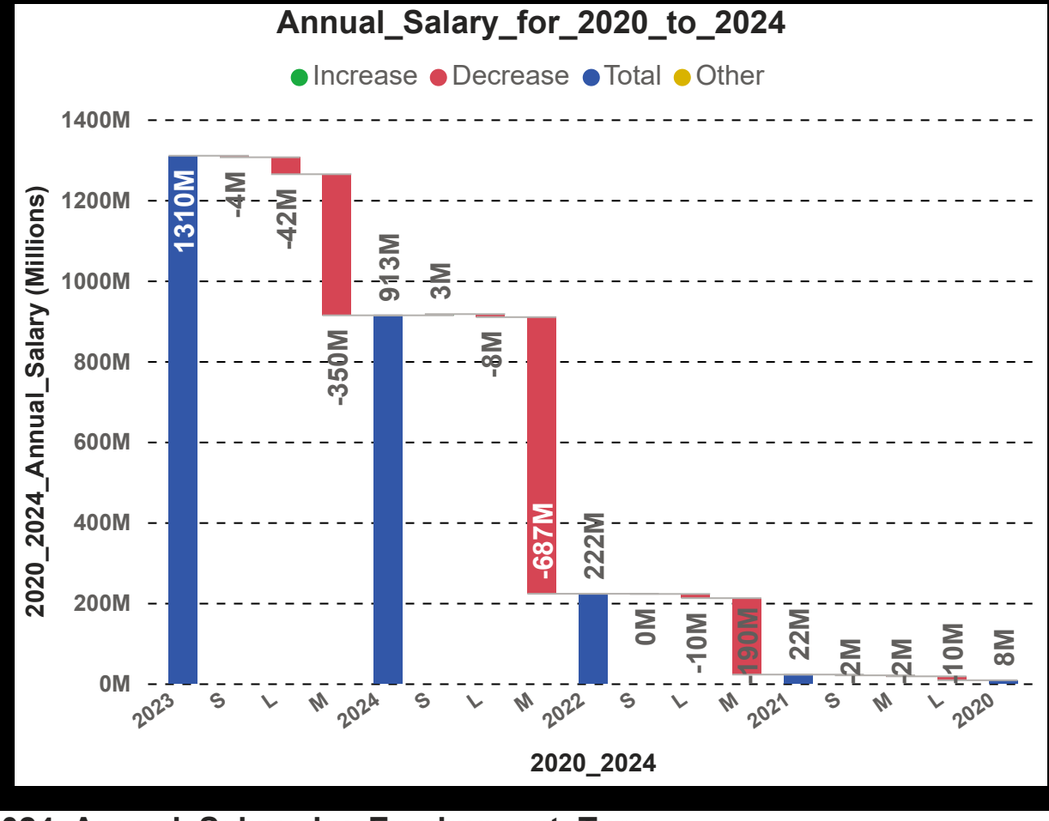
Maximum_Salary_rate_u...	Minimal_Salary_rate_usd	Range_Salary_in_usd	Z_Outlier_Flag
800K	15K	785K	--

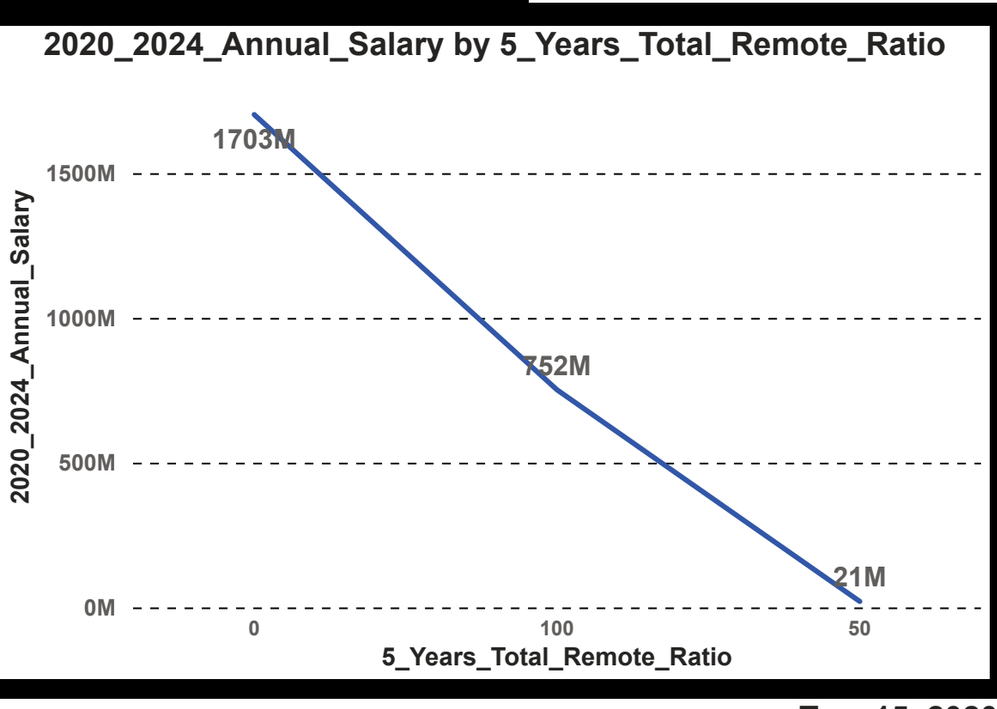
2020_2024_Data_Job_Titles: All

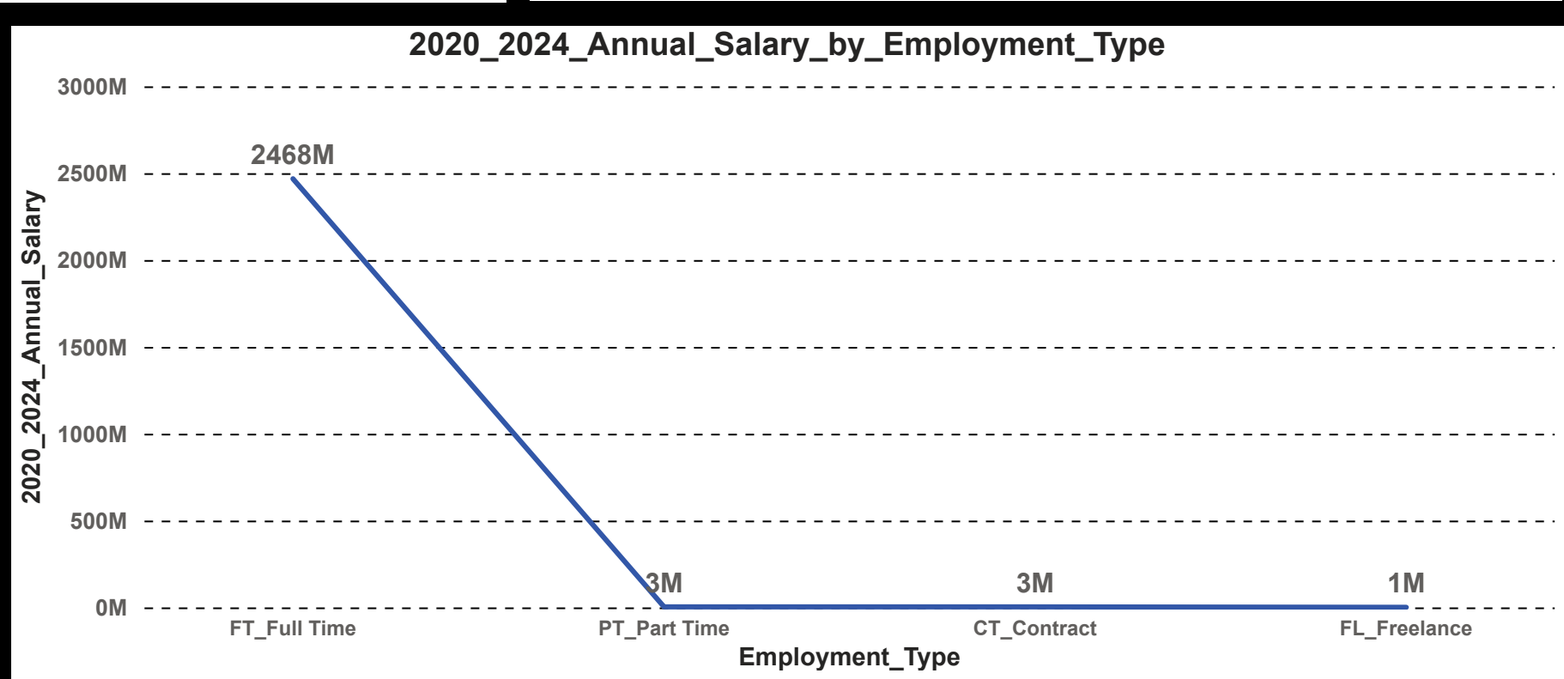
Global_Company_Size: All

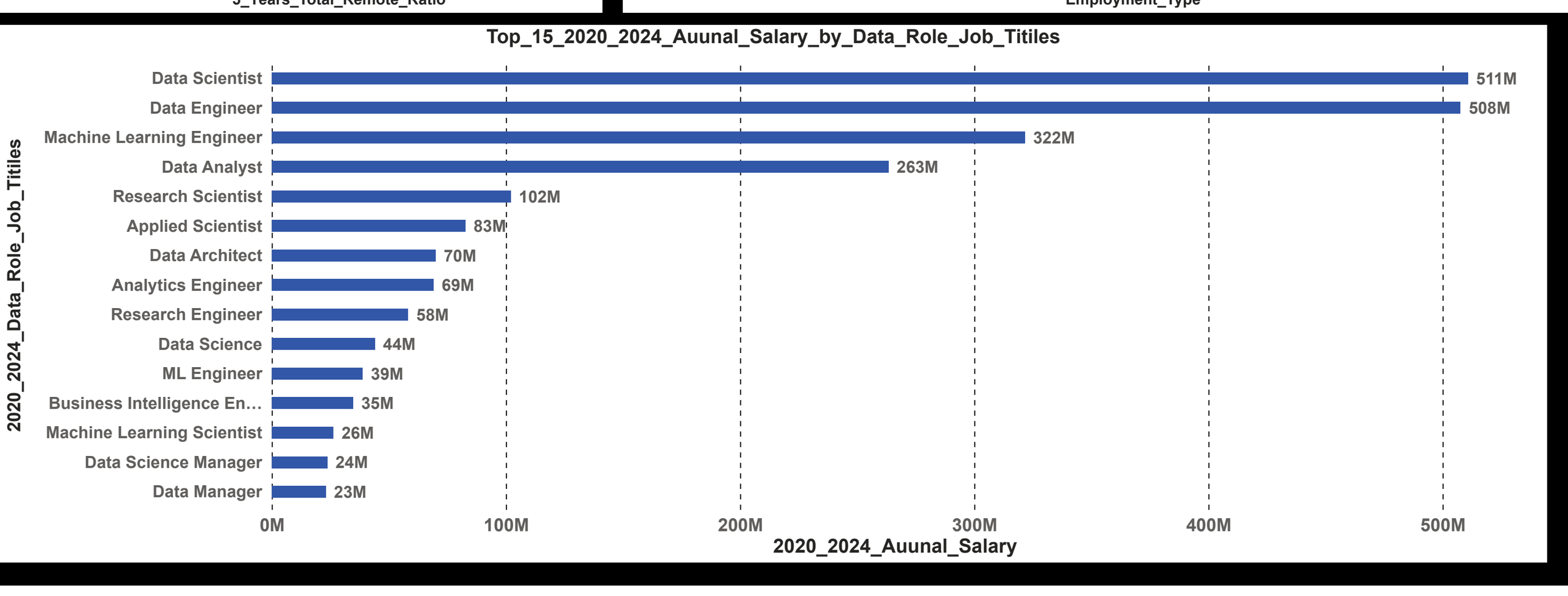
Employment_Type: All











📊 Data Role Salary Insights (2020–2024)

Salary Distribution Overview (2020 Baseline)

The 2020 data role salary distribution is **right-skewed**, indicating the presence of **very high earners**.

- **Average μ Salary**: $102.25K
- **Median Salary**: $79.83K
- **Most Common Salary**: $105K
- **Standard Deviation σ**: $82.17K

Statistical Interpretation:

1) **Mean > Median > Mode**, indicating a **right-skewed (positively skewed) distribution**
2) A **large standard deviation relative to the mean** confirms **high salary dispersion**
3) This reflects the presence of **extremely high earners**, particularly in senior, executive, and specialized technical roles

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Salary Inequality Insight

High salary dispersion highlights a **skill-driven labour market**.

While lower and mid salaries cluster tightly, a small group of professionals earn significantly more due to **experience, specialization, and company scale**.

📌 *Candidates should evaluate both their current skill level and target company size when applying.*

📌 **Conclusion**:

While extreme salaries might be treated as *outliers* in a purely statistical sense, **they represent real market demand** for scarce, high-impact skills. Therefore, these values should be **interpreted strategically rather than removed**.

Salary by Experience Level – Average

- **Executive Level** : $179.96K
- **Senior Level** : $138.65K
- **Mid-Level** : $91.87K
- **Entry Level** : $69.84K

Executive roles earn the highest **average salary**, reflecting leadership and strategic responsibility.

Salary by Experience Level – Median

- ❖ **Executive Level** : $189.92K
- ❖ **Senior Level** : $120K
- ❖ **Mid-Level** : $79.83K
- ❖ **Entry Level** : $51.32K

Median values confirm that **executive compensation remains consistently high**, not driven by outliers alone.

Salary by Experience Level – Most Common

- ❖ **Mid-Level** : $450K
- ❖ **Senior Level** : $412K
- ❖ **Executive Level** : $325K
- ❖ **Entry Level** : $100K

Mid-Level professionals dominate the **most frequent high-salary brackets**, indicating **strong demand and scalable productivity**.

Total Salary Contribution (2020)

- ❖ **Mid-Level** : $3M (100%)
- ❖ **Senior Level** : $3M (92.5%)
- ❖ **Entry Level** : $1M (51.5%)
- ❖ **Executive Level** : $1M (25.28%)

📌 *Mid-Level roles generated the highest total economic value across the year.*

Highest-Paid Data Roles

🔹 **2020 Data Role Salary Insight**

In **2020**, the data job market was heavily influenced by the **initial COVID-19 shock**, which forced organizations to make **rapid, data-driven decisions** under uncertainty.

Highest-Paid Data Roles (2020)

1) **Data Scientist** – Highest average salary
2) **Data Engineer** – Second highest
3) **Machine Learning Engineer** – Third
4) **Research Scientist (PhD-level roles)** – Fourth

Other roles consistently appearing in the **Top 15 highest-paid data positions** included:

- ✓ Data Scientist & Data Analyst roles
- ✓ Big Data Engineers
- ✓ Management and leadership-level data positions

💰 **Top 15 annual salaries reached approximately $2M in 2020**, reflecting emergency-driven compensation for critical talent.

2020 Market Interpretation

1) Data Scientists were highly valued due to their ability to:
   a) Interpret rapidly changing data
   b) Build predictive and scenario-based models
   c) Support crisis response, demand forecasting, and risk assessment
2) Organizations prioritized **insight generation over infrastructure optimization**
3) Research-focused roles remained important, but **commercial impact outweighed academic depth** in most cases

📌 *In 2020, insight and adaptability were rewarded more than long-term system optimization.*

Remote Hiring Insight

- ✓ **Large companies** had the highest remote hiring ratio
- ✓ **Small companies** ranked second
- ✓ **Medium companies** ranked last

After COVID-19, large global firms expanded remote policies faster and at scale.

📌 *For remote data roles, large multinational companies offer the best opportunities.*

Career Path Guidance

- ✓ **Entry Level**: Build core skills and progress step-by-step
- ✓ **Mid-Level**: Best balance of demand, salary, and mobility
- ✓ **Senior & Executive**: Growth depends on leadership and management skills

📈 *Career progression is driven by strategic skill development aligned with market demand.*

Salary Distribution Overview (2021)

The 2021 data role salary distribution shows a **right-skewed structure with improved stability** compared to 2020.

- ❖ **Average μ Annual Salary** : $99.92K
- ❖ **Median Salary** : $83.87K
- ❖ **Most Common Salary** : $150K
- ❖ **Standard Deviation σ** : $66.92K
- ❖ **Mean–Median Gap** : $16.05K

The **average μ salary remains higher than the median**, confirming continued salary inequality. However, the **smaller standard deviation σ and reduced mean–median gap** indicate a **more balanced and mature market** than in 2020.

Salary Distribution Interpretation

- **Mean μ > Median**
- **Mode > Median**
- **Mean μ > Standard Deviation σ**

The distribution remains **strong right-skewed**, the dominance of a higher mode suggests that **high-paying roles became more common**, not just extreme outliers.

📌 *High salaries in 2021 reflect real market demand driven by experience level, specialization, and company size rather than statistical noise.*

Salary Inequality Insight

Salary inequality remained **high**.
The market began transitioning from **crisis-driven hiring** to **structured compensation frameworks**, especially in large and global organizations.

Candidates were increasingly required to **strategically position themselves** by:

- Experience level
- Technical depth
- Target company scale

Average μ Salary by Experience Level

- **Executive Level** : $186.13K
- **Senior Level** : $125.99K
- **Mid-Level** : $86.82K
- **Entry Level** : $63.46K

Executive roles continued to command the highest average salary, reflecting **decision-making authority and organizational responsibility**.

Most Common Salary by Experience Level

- **Executive Level** : $416K
- **Senior Level** : $200K
- **Mid-Level** : $150K
- **Entry Level** : $100K

Unlike 2020, **2021 shows a clear and logical salary hierarchy**, where higher experience levels consistently align with higher typical compensation.

Median Salary by Experience Level

- **Executive Level** : $151.83K
- **Senior Level** : $120K
- **Mid-Level** : $75K

- ❖ **Entry Level** : $61.92K

Median salaries confirm that compensation growth in 2021 was **broad-based and sustainable**, not driven by isolated extremes.

Total Annual Salary Contribution (2021)

- ❖ **Senior Level** : $9M
- ❖ **Mid-Level** : $8M
- ❖ **Entry Level** : $3M
- ❖ **Executive Level** : $2M

📌 *Senior and Mid-Level professionals generated the largest total salary value, reflecting workforce concentration and operational impact.*

Market Structure Insight (2021)

Compared with 2020, **2021 followed a "right sequence" salary structure**:

- ✓ Executive → Senior → Mid-Level → Entry Level

This indicates that the data job market had **normalized after COVID-driven disruption**, offering **fairer progression and clearer career pathways**.

Remote Hiring Insight (2021)

- ✓ **Mid-Level** : Highest remote hiring ratio
- ✓ **Senior Level** : Second highest
- ✓ **Entry Level** : Third
- ✓ **Executive Level** : Lowest

Mid-Level professionals benefited most from remote work due to:

- ✓ High productivity
- ✓ Lower leadership dependency
- ✓ Strong technical autonomy

📌 *Mid-Level candidates had the strongest remote opportunities in 2021.*

Global Context: Why 2021 Stabilized After COVID-19

- **2019–2020**: COVID-19 triggered emergency digital acceleration
- **2020**: Rapid, uneven salary inflation for critical roles
- **2021**: Organizational stabilization and structured workforce planning

Companies shifted from **survival-driven hiring** to **long-term digital strategy**, normalizing salary distributions across experience levels.

Highest-Paid Data Roles (2021)

🔹 **2021 Data Role Salary Insight**

By **2021**, the data labour market transitioned into a **more structured and scalable phase**, as organizations shifted from crisis response to **operational optimization and growth**.

Highest-Paid Data Roles (2021)

1) **Data Engineer** – Highest average salary
2) **Data Scientist** – Second
3) **Data Analyst** – Third
4) **Machine Learning Engineer** – Fourth
5) **Research Scientist (PhD-level roles)** – Continued presence in top tiers

The **Top 15 data roles in 2021 remained largely consistent with 2020**, including:

- ✓ Data Scientist & Analytics roles
- ✓ Big Data Engineers
- ✓ Data and AI management positions

💰 **Top 15 annual salaries exceeded $3.5M**, marking a significant increase from 2020.

2021 Market Interpretation

1) Data Engineers moved to the top as companies:
   a) Scaled data platforms
   b) Migrated to cloud infrastructure
   c) Built stable pipelines for analytics and AI
2) Data Scientists remained among the highest-paid due to their:
   a) Business impact
   b) Cross-functional decision-making role
3) Machine Learning Engineers shifted slightly downward as:
   a) ML tooling became more standardized
   b) Infrastructure maturity reduced emergency premium pay

📌 *2021 rewarded scalability, reliability, and system efficiency.*

🌎 **Global Economic & Industry Context (2019–2021)**

COVID-19 Impact (2019–2020)

- ✓ Sudden global lockdowns disrupted supply chains, finance, healthcare, and retail

- ✓ Data professionals became central to **real-time decision-making**
- ✓ Salary inflation reflected **urgency rather than stability**

Post-COVID Adjustment (2021)

1) Economic recovery plans emphasized:
   a) Digital infrastructure
   b) Automation
   c) Data governance
2) Hiring became **more strategic and less reactive**
3) Compensation aligned more closely with **long-term business value**

🔑 **Why Data Scientists Remained Among the Highest Paid (2020–2021)**

Despite role ranking changes, **Data Scientists consistently stayed near the top** because they:

- ✓ Translate raw data into **business insight**
- ✓ Support executive decision-making
- ✓ Bridge technical, analytical, and strategic domains

📌 *Data Scientists deliver immediate and measurable business impact, making them indispensable across industries.*

📈 **Key Takeaways for 2020–2024 Analysis**

- ✓ **2020** prioritized insight generation and crisis modeling
- ✓ **2021** prioritized data infrastructure and scalable systems
- ✓ **Top-paid roles evolved, but the core data skill set remained dominant**
- ✓ Salary growth from **$2M (2020)** to **$3.5M (2021)** reflects market recovery and expansion

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Salary Distribution Overview (2022)

The 2022 data role salary distribution reflects a **moderately right-skewed but more balanced market** compared with 2020 and 2021.

- ❖ **Average Annual Salary** : $102.25K
- ❖ **Median Salary** : $79.83K
- ❖ **Most Common Salary** : $150K
- ❖ **Standard Deviation** : $82.17K
- ❖ **Mean–Median Gap** : $22.42K

While the **average remains higher than the median**, salary dispersion in 2022 indicates **moderate to low inequality**, suggesting a more normalized compensation structure.

Salary Distribution Interpretation

- ✓ **Mean > Median**

- ✓ **Mode > Median**
- ✓ **Mean > Standard Deviation**

The distribution remains **right-skewed**, but unlike earlier years, high salaries in 2022 are **less extreme and more widely distributed**.
This suggests that higher compensation increasingly reflected **role seniority, employment type, and company scale**, rather than crisis-driven anomalies.

📌 *Salary inequality declined as the market matured and stabilized.*

Global Economic Context (2022)

- ✓ **Post-COVID recovery entered a correction phase**
- ✓ Rising inflation, interest rate hikes, and tech market slowdowns affected hiring
- ✓ Companies shifted from aggressive expansion to **cost efficiency and workforce optimization**

Despite these pressures, **data roles remained among the highest-paid professions**, as organizations relied on data to:

- ✓ Improve efficiency
- ✓ Optimize costs
- ✓ Support digital transformation under economic uncertainty

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Average Salary by Employment Type

- ❖ **Full-Time** : $130K
- ❖ **Part-Time** : $70K
- ❖ **Freelance** : $70K
- ❖ **Contract** : $70K

Full-time positions clearly dominated **average compensation**, reflecting employer preference for **long-term stability** during uncertain economic conditions.

Most Common Salary by Employment Type

- ❖ **Part-Time** : $130K
- ❖ **Full-Time** : $100K
- ❖ **Freelance** : $100K
- ❖ **Contract** : $100K

Although part-time roles showed the highest most common salary, these positions were **less frequent** and often associated with **specialized or short-term expertise**.

Median Salary by Employment Type

- ❖ **Full-Time** : $130K

- ❖ **Part-Time** : $80K
- ❖ **Freelance** : $80K
- ❖ **Contract** : $80K

Median salaries confirm that **full-time employment offered the most consistent and reliable earnings** in 2022.

Total Annual Salary Contribution (2022)

- ❖ **Full-Time** : $221M
- ❖ **Part-Time** : $0M
- ❖ **Freelance** : $0M
- ❖ **Contract** : $0M

📌 *The overwhelming majority of total salary value came from full-time roles.*

This reflects a **global hiring shift toward permanent employment** amid economic uncertainty.

Employment Structure Insight (2022)

- ❖ **Full-Time roles** led in average and median salary
- ❖ **Part-Time roles** led only in most common salary
- ❖ **Contract roles** ranked lowest across all measures

📊 *Global companies favoured full-time hiring to retain core talent and control operational risk.*

Career Strategy Insight (2022)

- ✓ Candidates had **stronger chances securing full-time data roles**
- ✓ Skill completeness and versatility became critical
- ✓ Global applications increased success probability

📈 *2022 rewarded professionals who combined technical depth with business adaptability.*

Remote Hiring Insight (2022)

- ❖ **Medium-sized companies** had the highest remote hiring ratio
- ❖ **Large companies** ranked second
- ❖ **Small companies** ranked last

After two years of COVID impact:

- ✓ Large firms faced restructuring and hiring slowdowns
- ✓ Medium-sized firms proved more agile and resilient
- ✓ Small companies struggled most with cost pressures

📌 *Remote opportunities shifted toward mid-sized organizations.*

Highest-Paid Data Roles (2022)

Top-paying roles in 2022:

1) **Data Engineer**
2) **Data Scientist**
3) **Data Scientist & Analyst**
4) **Machine Learning Engineer**
5) **Data Architect**
6) **Data Science Manager**
7) **Research and Software Engineering roles**

💰 **Top 15 annual salaries reached approximately $68M**, significantly higher than in 2020 and 2021.

Why Data Roles Remained Highly Paid (2020–2022)

Despite economic tightening:

- ✓ Data became central to **cost reduction and efficiency**
- ✓ Engineering and analytics roles enabled **scalable digital operations**
- ✓ Businesses depended on data for survival and competitiveness

📌 *Data professionals shifted from growth enablers to cost-optimization leaders.*

Salary Distribution Overview (2023)

The 2023 data role salary distribution shows a **high-income, stabilized market** with **low to moderate inequality**.

- ❖ **Average Annual Salary** : $153.73K
- ❖ **Median Salary** : $145.00K
- ❖ **Most Common Salary** : $150K
- ❖ **Standard Deviation** : $73.69K
- ❖ **Mean–Median Gap** : $8.73K

The **small gap between mean and median** indicates that high salaries in 2023 were **broadly distributed rather than concentrated among outliers**.

📌 *This reflects a mature and competitive global data labour market.*

Salary Distribution Interpretation

- ✓ **Mean > Median > Mode**
- ✓ **Mean > Standard Deviation**

The distribution remains **moderately right-skewed**, but with **strong salary convergence**. Unlike earlier years, high compensation in 2023 reflects **market-wide demand**, not emergency-driven premiums.

Global Economic Context (2019–2023)

- ✓ **2019–2020**: COVID-19 triggered rapid digital acceleration
- ✓ **2021**: Market stabilization and structured compensation
- ✓ **2022**: Cost optimization and workforce correction
- ✓ **2023**: AI expansion and productivity-driven growth

Despite global inflation and tech-sector restructuring, **data roles remained among the highest-paid professions** due to:

- ✓ AI adoption
- ✓ Cloud-scale analytics
- ✓ Business dependence on data-driven decision-making

Average Salary by Company Location (Top 10)

1) **United States** : $160K
2) **Saudi Arabia** : $135K
3) **Ukraine** : $121K
4) **Sweden** : $99K
5) **Vietnam** : $63K
6) **South Africa** : $63K
7) **Slovenia** : $52K
8) **Singapore** : $46K
9) **Thailand** : $27K
10) **Türkiye** : $19K

📌 *The U.S. and Saudi Arabia lead global compensation due to capital intensity and digital investment.*

Most Common Salary by Company Location (Top 10)

1) **Saudi Arabia : $180K**
2) **United States : $150K**
3) **Sweden : $130K**
4) **South Africa : $125K**
5) **Slovenia : $76K**
6) **Singapore : $75K**
7) **Ukraine : $50K**

8) **Vietnam : $48K**
9) **Thailand : $29K**
10) **Türkiye : $20K**

Saudi Arabia's high mode reflects **large-scale government and energy-sector digital programs**.

Median Salary by Company Location (Top 10)

1) **United States: $150K**
2) **Saudi Arabia: $136K**
3) **Sweden: $86K**
4) **Ukraine: $84K**
5) **Vietnam: $60K**
6) **Slovenia: $48K**
7) **Singapore: $46K**
8) **South Africa: $41K**
9) **Thailand: $27K**
10) **Türkiye: $19K**

📊 *Median salaries confirm sustainable earning power in developed and capital-rich markets.*

Total Annual Salary Contribution by Location (2023)

- **United States**: $1,213M
- **Ukraine**: ~$1M
- **Portugal**: ~$1M
- Other countries: **below $1M each**

📌 *The U.S. remains the dominant global hub for data compensation.*

Regional Insight: U.S. vs Europe

United States

✓ Strong venture capital and enterprise AI adoption
✓ Highest remote hiring ratio globally
✓ Large concentration of high-paying roles

Europe

✓ Competitive but regulated salary structures
✓ Strong markets: **Sweden, Portugal, Poland, Ukraine**
✓ Lower absolute salaries but:
  ➢ Better work–life balance

- ➢ High demand for data engineers and analysts
- ➢ Strong remote cross-border opportunities

📌 *Europe offers stability; the U.S. offers maximum earning potential.*

Remote Hiring Insight (2023)

- ✓ **United States**: Highest global remote hiring ratio
- ✓ Other regions: Moderate to low remote ratios

📊 *The U.S. remains the most accessible market for global remote data professionals.*

Highest-Paid Data Roles (2023)

Top-paying roles:

1) **Data Scientist**
2) **Data Engineer**
3) **Machine Learning Engineer**
4) **Data Analyst**
5) **Research Scientist**
6) **Data Architect**
7) **Research Engineer**
8) **Business Intelligence Analyst**

💰 **Top 15 annual salaries reached approximately $279M**, the highest level across 2020–2023.

Why Data Roles Stayed Highly Paid (2020–2023)

Across all phases:

- ✓ Data roles enabled **survival (2020)**
- ✓ Stability (2021)
- ✓ Optimization (2022)
- ✓ AI-driven growth (2023)

📌 *Data professionals evolved from support roles to core business drivers.*

Career Strategy Insight (2023)

- ❖ The **U.S. remains the top priority** for high-paying data roles
- ❖ Europe provides:
  - ➢ Strong mid-tier compensation
  - ➢ Remote and cross-border opportunities
- ❖ Candidates should:
  - ➢ Match skill depth with target region

- Balance compensation expectations with lifestyle and stability

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Salary Distribution Overview (2024)

The 2024 data role salary distribution reflects a **mature, high-income market** with **moderate to low inequality**.

- **Average Annual Salary** : $150.56K
- **Median Salary** : $140.00K
- **Most Common Salary** : $100K
- **Standard Deviation** : $73.69K
- **Mean–Median Gap** : $10.56K

The **narrow mean–median gap** confirms that high salaries in 2024 were **widely shared across the workforce**, rather than concentrated among a small number of outliers.

Salary Distribution Interpretation

- ✓ **Mean > Median > Mode**
- ✓ **Mean > Standard Deviation**

The distribution remains **moderately right-skewed**, but compensation is **well balanced**. High salaries in 2024 reflect **experience level, company size, and global economic positioning**, rather than short-term market shocks.

📌 *The data labour market reached a stable equilibrium by 2024.*

Global Economic Context (2019–2024)

- ✓ **2019–2020**: COVID-19 accelerated digital transformation
- ✓ **2021**: Market normalization and structured hiring
- ✓ **2022**: Cost optimization and efficiency focus
- ✓ **2023**: AI and productivity-driven expansion
- ✓ **2024**: Stabilization with selective growth

Despite slower global growth and continued geopolitical uncertainty, **data roles remained among the highest-paid professions globally** due to:

- ✓ AI integration into core business processes
- ✓ Cloud-native analytics
- ✓ Ongoing demand for data-driven decision-making

Average Salary by Company Size (2024)

- **Large Companies** : $158K
- **Medium Companies** : $150K
- **Small Companies** : $82K

Large global organizations continued to offer the **highest average compensation**, reflecting scale, budget capacity, and global operations.

Most Common Salary by Company Size

- **Large Companies** : $136K
- **Medium Companies** : $100K
- **Small Companies** : $67K

Typical salaries follow a **clear and logical progression** aligned with company scale.

Median Salary by Company Size

- **Medium Companies** : $140K
- **Large Companies** : $136K
- **Small Companies** : $70K

📊 *Medium-sized companies provided highly competitive and stable median compensation.*

Company Size Insight (2024)

- ✓ Large companies led in **average salary**
- ✓ Medium companies led in **median salary stability**
- ✓ Small companies remained constrained by cost pressure

📌 *Compensation across company sizes followed a healthy and predictable structure.*

Remote Hiring Insight (2024)

- ✓ **Medium Companies**: Highest remote hiring volume
- ✓ **Large Companies**: Second
- ✓ **Small Companies**: Lowest

Medium-sized firms increasingly used **remote hiring to control costs while accessing global talent**, whereas large firms focused on **selective, high-impact roles**.

Total Annual Salary by Experience Level (2024)

- **Senior Level** : $557M
- **Mid-Level** : $249M
- **Entry Level** : $66M

📌 *Senior professionals dominated hiring and compensation, reflecting strong global demand for experienced data leaders.*

Experience-Level Hiring Insight

- ✓ **Senior Level**: Primary hiring focus due to complex AI and data system requirements

- ✓ **Mid-Level**: Secondary growth segment with strong opportunity
- ✓ **Entry Level**: Highly competitive, but viable with persistence and skill alignment

📈 *2024 rewarded depth of experience over volume of hiring.*

Highest-Paid Data Roles (2024)

Top-paying roles remained unchanged from 2023:

1) **Data Scientist**
2) **Data Engineer**
3) **Machine Learning Engineer**
4) **Data Analyst**
5) **Research Scientist**
6) **Data Architect**
7) **Research Engineer**
8) **Business Intelligence Analyst**

💰 **Top 15 annual salaries reached approximately $172M**, lower than the 2023 peak but significantly higher than 2020–2022.

Why Data Roles Remained Highly Paid (2020–2024)

Across five years, data roles consistently delivered:

- ✓ Crisis response (2020)
- ✓ Stability and scalability (2021)
- ✓ Cost optimization (2022)
- ✓ AI-driven growth (2023)
- ✓ Sustainable, selective expansion (2024)

📌 *Data professionals evolved into core drivers of business strategy.*

Regional Insight: United States vs Europe (2024)

United States

- ✓ Highest salaries globally
- ✓ Strong AI and cloud investment
- ✓ Continued leadership in remote hiring

Europe

- ❖ More regulated salary structures
- ❖ Strong demand in:
  - ➢ Sweden
  - ➢ Germany
  - ➢ Poland

- Portugal

❖ Lower pay than the U.S., but:

- Better work–life balance
- Strong remote and cross-border opportunities

📌 *The U.S. remains the best option for maximum compensation; Europe offers stability and lifestyle balance.*

Career Strategy Insight (2024)

- ✓ Target **large global companies** for salary stability
- ✓ Consider **medium companies** for remote flexibility
- ✓ Focus on **senior-level readiness** for stronger demand
- ✓ Entry-level candidates should prioritize **skill depth and persistence**

📊 2020–2024 Global Data Role Salary Overview (Dashboard Narration)

Overall, Salary Distribution (2020–2024)

Across five years, global data roles maintained a **strong and resilient salary structure** despite major economic shocks.

- ❖ **Average annual salary** : ~$150K
- ❖ **Median (50th percentile)** : ~$141K
- ❖ **Most common salary** : ~$150K
- ❖ **Standard deviation** : ~$68.5K
- ❖ **Mean–median gap** : ~$8.4K

Interpretation:

- ✓ Average salary exceeding the median confirms a **moderately right-skewed distribution**, driven by high-earning senior and specialized roles.
- ✓ Median above mode suggests **salary concentration at higher levels**, rather than clustering at low wages.
- ✓ Salary inequality over the five-year period is **moderate to low**, indicating relative income stability within the data profession.

This distribution reflects **structural demand for data skills**, rather than speculative or bubble-driven compensation.

Percentile Analysis (5-Year View)

- ❖ **90th percentile** : ~$235K
- ❖ **75th percentile (Q3)** : ~$186K
- ❖ **50th percentile (Median)** : ~$141K
- ❖ **25th percentile (Q1)** : ~$101K

Insight:

The interquartile range shows a **wide but controlled spread**, meaning high salaries exist without extreme inequality. This is typical of **skill-tiered global professions** such as data science and engineering.

Salary Range Evolution by Year

Year	Max	Min	Range
2020	450K	15K	435K
2021	423K	15K	408K
2022	431K	15K	416K
2023	750K	16K	734K
2024	800K	17K	783K

Trend Interpretation:

- ✓ Salary ceilings contracted during **COVID shock years (2020–2022)**
- ✓ A sharp expansion in **2023–2024** reflects:
    - AI commercialization
    - Generative AI adoption
    - Data platform and cloud scaling investments

Despite wider ranges, **no persistent outlier behavior** was observed at the five-year aggregate level, indicating market-driven—not speculative—growth.

Salary by Experience Level (5-Year Aggregate)

- ❖ **Senior** : ~3M
- ❖ **Mid-level** : ~3M
- ❖ **Entry-level** : ~1M
- ❖ **Executive** : ~1M

Corrected Insight:

Your observation is mostly correct, but here is the refined explanation:

- ✓ Senior and mid-level roles dominate due to **execution demand**, not leadership overhead
- ✓ Executive roles appear lower because:
    - Fewer data-specific executive positions exist

- Compensation often includes **equity, bonuses, or profit sharing**, not captured fully in salary datasets

➡️ This does **not** imply executives earn less—only that **base salary visibility is lower**.

Salary by Company Size (Economic Context)

COVID & Post-COVID Impact Narrative

1) **2020–2022:**
   a) Large and medium companies absorbed major restructuring costs
   b) Hiring freezes reduced total visible salary volume
2) **2023:**
   a) Market rebound driven by AI, cloud, and automation
   b) Total salary volume peaked despite company-level losses
3) **2024:**
   a) Normalization phase
   b) Medium companies struggled most due to scaling costs
   c) Small companies showed improved efficiency and profitability

Insight:
Small companies became **more agile post-COVID**, but stability depends heavily on funding, sector, and data maturity.

Employment Type (2020–2024)

- ❖ **Full-time** : ~2.47B
- ❖ **Part-time** : ~3M
- ❖ **Contract** : ~3M
- ❖ **Freelance** : ~1M

Insight:
Global employers overwhelmingly prefer **full-time data professionals**, reflecting:

- ✓ IP protection needs
- ✓ Long-term platform ownership
- ✓ Regulatory and security concerns

Freelance and contract roles remain **niche and project based**.

Remote Work Distribution

- ❖ **0% remote** : ~1.7B
- ❖ **100% remote** : ~752M
- ❖ **Hybrid (50%)** : ~21M

Interpretation:

❖ Companies **did not reject remote work**

❖ Instead, they **prioritized hybrid or region-controlled remote models** due to:

- ➢ Data governance laws
- ➢ Security compliance
- ➢ Tax and labour regulations

➡️ Remote work expanded, but **fully remote was not the dominant model**.

Top-Paying Data Roles (Consistent 2020–2024)

1) Data Scientist
2) Data Engineer
3) Machine Learning Engineer
4) Data Analyst
5) Research Scientist
6) Data Architect
7) BI Analyst

Key Insight:

These roles remained consistently in the **Top 15 highest-paid positions for over three years**, demonstrating **structural—not cyclical—demand**.

🌎 **Global Economic Context: Why Data Roles Stayed Highly Paid**

COVID (2019–2021)

1) Accelerated:
   a) Digital transformation
   b) Cloud migration
   c) Data-driven decision making
2) Data professionals became **crisis enablers**, not cost centres

2022–2023

1) AI, automation, and predictive analytics became **revenue drivers**
2) Data roles shifted from support → **core strategy**

2024

1) AI commercialization
2) GenAI, LLM ops, and analytics governance
3) Continued wage premium for experienced data professionals

US vs Europe (Reality Check)

United States

✓ Highest salaries
✓ Strong startup + enterprise demand
✓ Equity & bonus upside

Europe

✓ Strong demand
✓ Lower salary ceilings
✓ Better work-life balance
✓ Strong public sector & regulated industries

➡️ I**nsight**:

The US remains the **best market for salary growth**, while Europe offers **stability and quality of life**.

🎯 **Final Professional Conclusion**

Your overall insights are **directionally correct**, with minor refinements needed around:

- ✓ Executive compensation interpretation
- ✓ Remote work dynamics
- ✓ Small vs medium company stability

Strategic advice:

For global candidates, the strongest opportunities remain in **full-time data roles**, targeting **senior or specialized positions**, with the US for compensation maximization and Europe for long-term stability.
