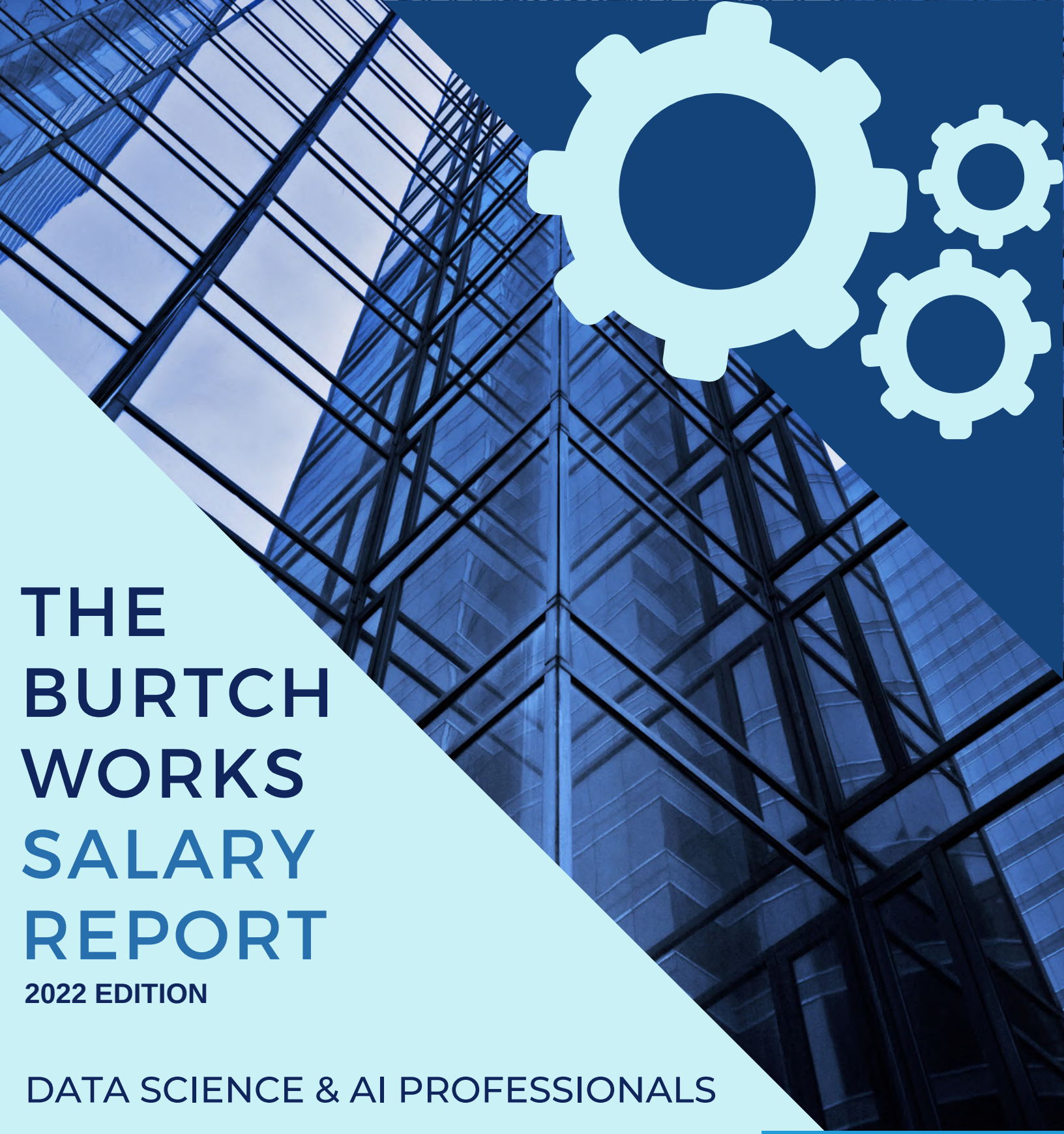


THE BURTCH WORKS SALARY REPORT

2022 EDITION

DATA SCIENCE & AI PROFESSIONALS

Burtch Works
Executive Recruiting

Forbes 2022
AMERICA'S BEST EXECUTIVE RECRUITING FIRMS
POWERED BY STATISTA

TABLE OF CONTENTS

ABOUT BURTCH WORKS

Burtch Works is a national leader in Total Talent Solutions, specializing in Data Engineering, Analytics, Data Science, AI and Technology. As pioneers of the industry, we pride ourselves on our specialized approach to providing subject matter expertise, compelling job opportunities, and leading information and research on trends in this industry. This year, Burtch Works continues to expand its research and involvement in the data science and analytics community in response to the accelerated economic restart and digital transformation efforts taking place globally.

As trusted advisors to the industry, we have been interviewed for our insights on the data science and analytics talent market by The New York Times, The Wall Street Journal, CNBC, Mashable, Forbes, The Chicago Tribune, The Economist, Bloomberg, Analytics Magazine, InformationWeek, Hunt Scanlon, and many more. This year, **Burtch Works is proud to once again have been recognized by Forbes as one of America's Best Recruiting Firms** for the fifth year running. We've conducted joint surveys in partnership with the International Institute for Analytics (IIA), Forrester Research, and others to provide invaluable data and insights for analytics and technology teams across all industries, and have also published numerous other studies and research on current hiring trends, the job market, and how teams are preparing for success in the new digital economy.

Our leadership team shares a collective 100+ years of recruiting experience in Data Analytics and Technology disciplines, allowing us to develop an especially comprehensive understanding of the transformation taking place across industries in these growing fields. Our specialties include a number of analytical and technology-driven fields such as: data science, predictive analytics, data engineering, business intelligence, product development, quantitative business analytics, operations research, web analytics, credit/risk analytics, marketing research, and many more.

ABOUT BURTCH WORKS

Because our recruiters are so well-versed in the subtle nuances of their area of expertise, they are able to effectively navigate the talent movement and hiring trends unique to each area, and find individuals perfectly suited to each role. Our team often writes on topics of interest to the communities we serve and has maintained a blog on hiring trends for over 10 years, keeping a finger on the pulse of current market trends.

As data-first practices have become a necessary strategy to remain competitive in the age of digital transformation, the Data Analytics and Technology fields continue to experience incredible growth. Burtch Works has built a diverse network of tens of thousands of professionals to address the rapidly growing number of data-driven positions, which is the foundation of a business built on long-standing relationships with both candidates and clients. The Burtch Works team emphasizes a shared vision and commitment to helping our network navigate an evolving industry as well as a commitment to solving their complex business challenges.

In maintaining such strong relationships with candidates and clients, Burtch Works has an especially unique ability to examine hiring and compensation trends over time. Using our extensive proprietary data, we publish several highly anticipated studies each year that investigate demographic and compensation data for data science & analytics, data engineering, and marketing research & insights professionals. The Burtch Works Studies provide an exceptional vantage point on compensation for these professionals across the country and contain critical information both for individuals mapping their career strategy, and for leaders who are hiring and planning to recruit and retain outstanding talent for their teams.

This year, we have altered our nomenclature to better reflect the titling trends in the quantitative hiring market, along with the distinguishing factors that separate Data Scientists (formerly referred to as Predictive Analytics Professionals) from Artificial Intelligence (AI) Professionals (formerly referred to as Data Scientists).

See page 40 to learn more about this report's methodology.

Section 1
Introduction

DATA SCIENCE & AI PROFESSIONALS SALARY AND HIRING TRENDS

What a difference a year can make...

We approached this year's salary data (gathered from May 2021 through April 2022) with great interest, since the timing lines up well with the economic recovery that began in Q2 of 2021. Our data shows that 2022 salaries significantly increased at all job levels for both data scientists and AI professionals. These salary increases are unlike anything we have seen in the past (it's our 10th year delivering this report), and these unprecedented times in the job market are still continuing to make a strong impact on candidate compensation.

Given the immense volume of professionals changing jobs along with the buzz surrounding the Great Resignation, we have compiled a list of trends we have noticed over the past year:

2022 Hiring Indicates Booming, Competitive Market

Many data science & analytics teams had already resumed hiring last year (escalating in Q2), and so far in 2022, hiring has been incredibly competitive. At the beginning of the year, our research found that 83% of data science and analytics teams were planning to hire during Q1 or Q2 of 2022.

Our respondents spanned over 160 companies across the U.S., and while 17% of teams reported they are holding steady, it is notable that none of the companies we surveyed this year reported that they were planning to cut back their teams. The hiring momentum that picked up during the second half of 2021 has remained, however, there have been some very recent signs of pullbacks and layoffs.

Permanent hiring continues to be the favored method of adding headcount. Time will tell if the trend flips to favor contract hiring over permanent hiring if there is an economic slowdown.

a year's overview

WHERE WE ARE NOW

Financial Services is on the Move

Over the past few years, the economic disruption and digital transformation in financial services has led to more institutions investing in data science and AI hires, which were uncharacteristically high in 2022 compared to past years.

While this may be due to a variety of reasons, the emergence of fintech and explosion in the cryptocurrency space is at least partially the reason behind these swift changes. Neobanks have also quickly gained popularity over the past year, sometimes referred to as “challenger banks,” they are fintech firms that offer apps, software and other technologies to streamline mobile and online banking. These fintechs generally specialize in particular financial products and tend to be more nimble and transparent, leading to increased appeal from modern users.

The concentration in the financial services space, along with the push to be enabled by technology investments to the cloud are all factors towards industry-wide adaptations.

COVID-19's Continued Impact on Women's Industry Representation

While many working parents likely felt the acute crunch between their home and work lives over the past few years (especially those with younger or school-age children), this disruption continues to impact the women in our sample slightly more than their male counterparts. In our Data Science sample, the percentage of women fell from 25% last year to 24% in 2022. In our AI Professionals sample, while the percentage of women did increase from 17% in 2021 to 20% in 2022, it is still notable and continues to point to disparities in industry representation as women are still heavily underrepresented in the space.

before & after

THE GREAT RESIGNATION & INCREASED INVENTORY OF ROLES

The effects of the COVID-19 pandemic on the hiring market have shifted significantly over the past few years. During the immense disruption of 2020, many professionals chose to put planned job searches on hold, while some data science teams were more impacted than others in terms of their hiring plans and response to the initial crisis.

As the economic recovery picked up in 2021, we saw more data science teams planning to hire. There was also massive turnover in the labor market, dubbed the Great Resignation, as many professionals resumed their job searches or sought to change their working situation due to other pandemic-related factors. **Unfortunately for those looking to hire, this has led to fewer professionals on the market in 2022, and a lower inventory of available candidates.** Many candidates that are still on the market are coming to the table with numerous offers and are seeking a meaningful increase in salary, along with other benefits.

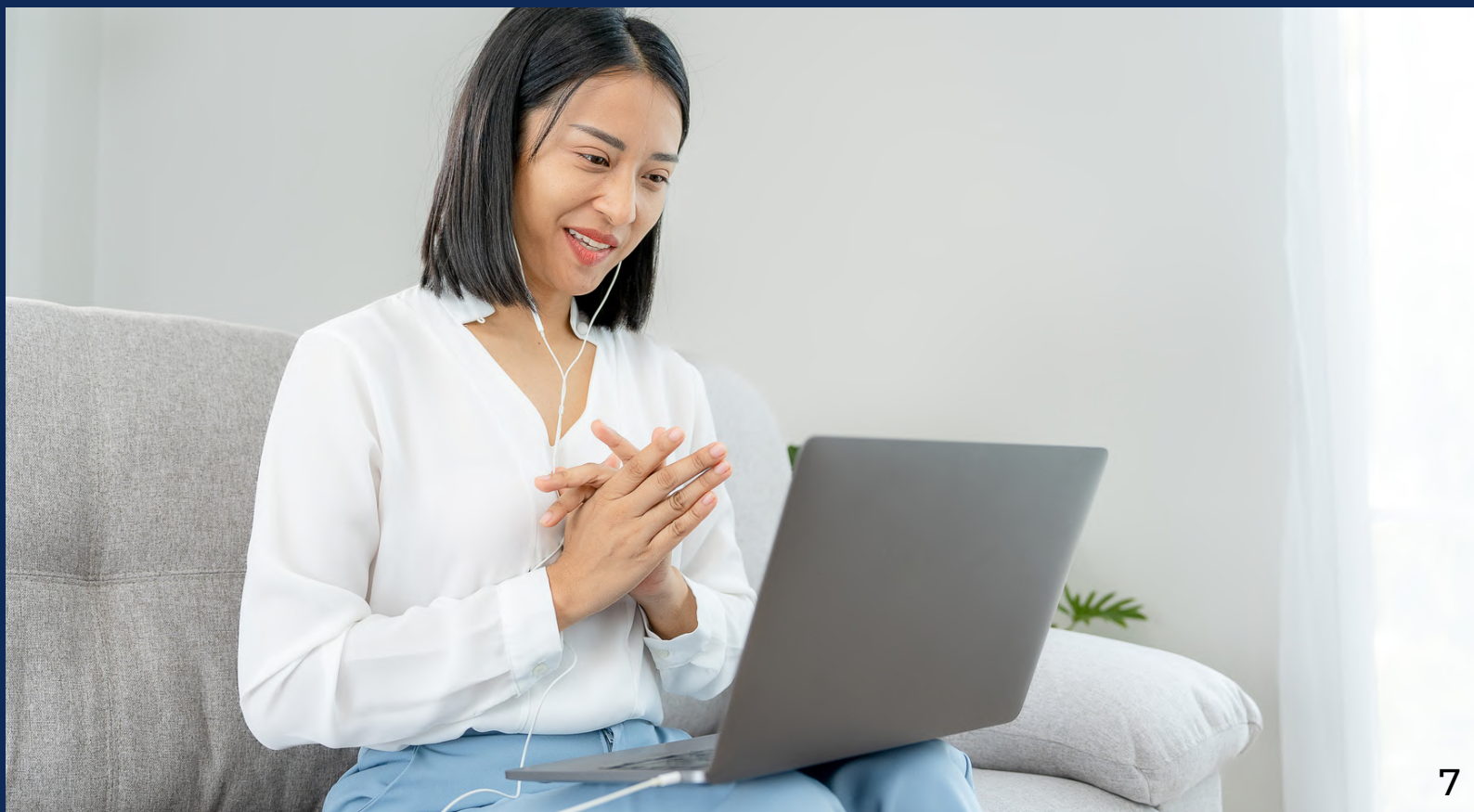
Changes in Hiring:

Interview Process Becomes Streamlined

- Rethinking Coding Exams
- Speed Up Process
- Sell Your Opportunity

Given the competitive nature of today's hiring market, it is crucial for organizations to curate a streamlined and transparent interview process. Utmost clarity as far as the role and responsibilities, tool usage, and day to day work will allow the candidate to get the deepest understanding of what the role entails. From our recent conversations with clients and candidates, it is evident that the interview process has seen some immense shifts over the past few years and companies have realized the importance of improving their interviewing strategies to allow for a streamlined and effective process when vetting candidates for their open roles.

It is also notable that long-form technical assessments and coding exams are used less frequently in the interview process and companies are beginning to assess a gap in skill as something that could be closed through training and mentorship when a candidate is onboarded. To remain competitive, it is vital to keep your interview process efficient and to effectively sell your opportunity.



Changes in Hiring:

Retention & Recruiting Strategies are Brought to the Forefront

- Examine Compensation
- Internal Relationships
- Alumni Opportunities

Our research has repeatedly found that data science professionals who changed jobs were receiving significant salary increases, so be sure that you're aware of current market rates if you wish to retain key staff. **We've also seen some data science teams employing the use of preemptive retention bonuses or spot bonuses to recognize work on key projects, and even salary increases outside of the normal annual schedule.**

Positive relationships can go a long way towards retaining employees, including managing relationships between you and your data science team, as well as fostering camaraderie within the team. **Strong communication, transparency, and offering mentorship can all build stronger relationships between leadership and the team.** For early career employees especially, focusing on team-building or fun activities can build stronger cohesion within the team, which can help make employees less likely to be tempted by other job offers.

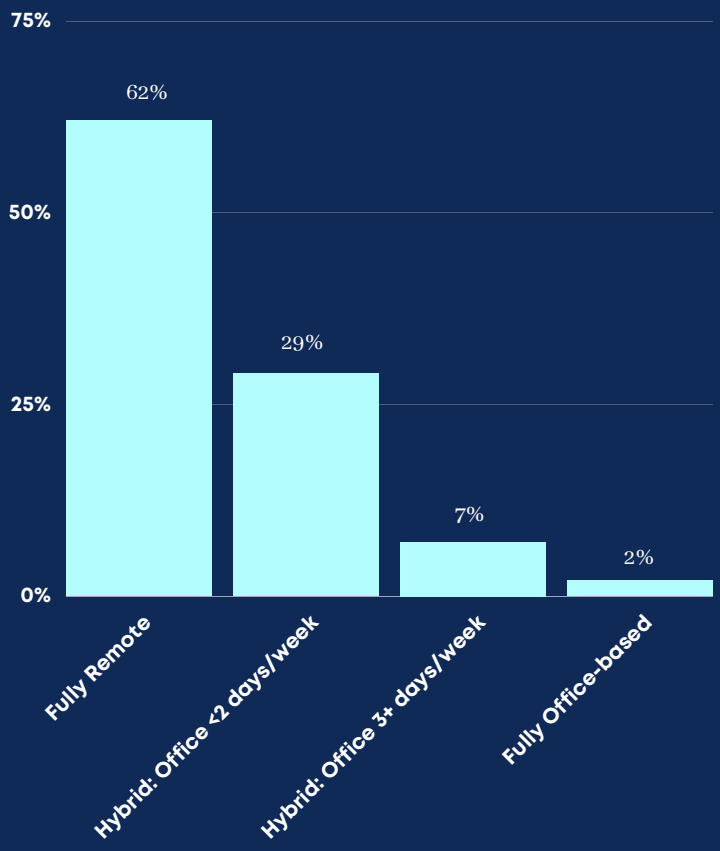
It is also important to maintain relationships with company alumni as we have seen several candidates return to their previous companies for a variety of reasons. Working with students can also provide ample opportunities to see how they work, introduce them to practical tools, and even serve as a sort of extended interview process for students that you may want to hire upon graduation or for internships. This could include institutes or programs as well as partnering with student-run organizations.

Changes to Come: Storm Clouds on the Horizon?

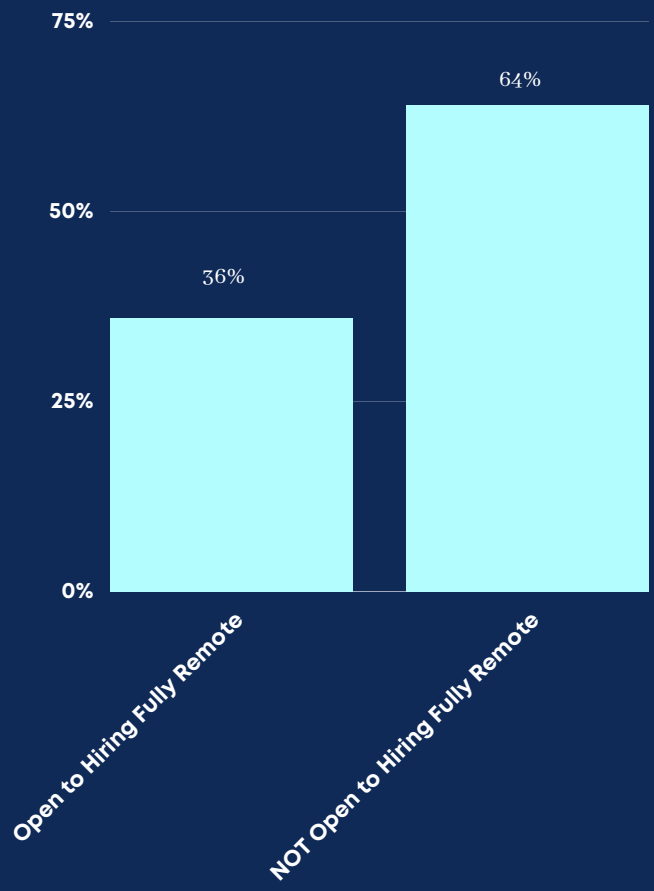
In May of 2022, we have started to hear of **companies implementing hiring freezes and layoffs and even data science and AI professionals are being impacted by these changes.**

These uncertain times are causing a ripple in many industries: funds are slowing for smaller, newer companies and interest rate increases are impacting financial services firms. Similarly, inflation is hurting CPG, retail and manufacturing firms, while supply chain issues are taking a toll on technology firms. Burtch Works will continue to monitor these important changes in the market. Stay tuned for our upcoming research and observations.

As Teams Balance Employee Preference with Company Policy, **WFH Continues to Evolve**



CANDIDATES



CLIENTS

With many companies evaluating their WFH and remote work policies going forward, we sent out a survey earlier this year to gauge candidate and client WFH preferences.

It is evident that fully remote positions are still heavily favored amongst candidates due to a increased flexibility. Contrary to that, company leaders like Jamie Dimon (JPMorgan Chase), Elon Musk (Tesla Motors) and even Howard Schultz (currently leading Starbucks) are pushing for corporate workers to come back to the office.

The idea that remote work has opened doors for individuals to work in cities across the country is shifting quickly towards more and more requests to relocate. **This evolution in policies is generally translating to a hybrid model where individuals are expected to come into the office on a partial or an as-needed basis.** With that said, there are countless roles and opportunities open to those that are seeking a fully remote position, but they are not the majority of roles available as often assumed or reported by the media.

a year's overview

DATA SCIENCE & ANALYTICS DEMOGRAPHIC TRENDS:

THE EDUCATION SCRAMBLE

In both the AI professionals and data science samples, there was a slight decrease in the number of professionals with PhDs, which is a slight reversal of the trend from 2021 data where we had seen increases. The AI Professionals sample decreased from 48% in 2021, to 39% in 2022, while the data science sample decreased from 19% in 2021 to 12% in 2022.

As business applications for data science and analytics have become more complex, and as the discipline has matured, it has created a friendlier environment for people with Master's degrees to complete data related endeavors that were done by PhDs only a handful of years ago.

Many graduate programs are also offering more business internships, so students who are intrigued by the types of applied use cases for their work in the corporate sector (including computer vision, IoT, and NLP, among others) may opt to move into business roles.

There have also been many changes to travel policies in the past 2 years that have directly impacted international students. According to U.S. News, the total number of international students at U.S. universities dropped by 15% from 1,075,496 in 2019-2020 to 914,095 in 2020-2021. The number of new international students enrolling in U.S. universities dropped by 45.6% in that time frame. This trend could potentially result in the U.S. losing its STEM advantage.

Explosive Increase in Early Career Data Science and AI Professionals

Since data science & analytics has been a growing field with significant interest from students and early career professionals over the past several years, we've consistently noted that our data science & analytics samples will have a significant portion of professionals with 0-5 years' experience – those just entering the field. **This trend continues this year with increased demand for professionals belonging to the IC-2 level with 5-10 years' experience.**

Section 2

Compensation Changes

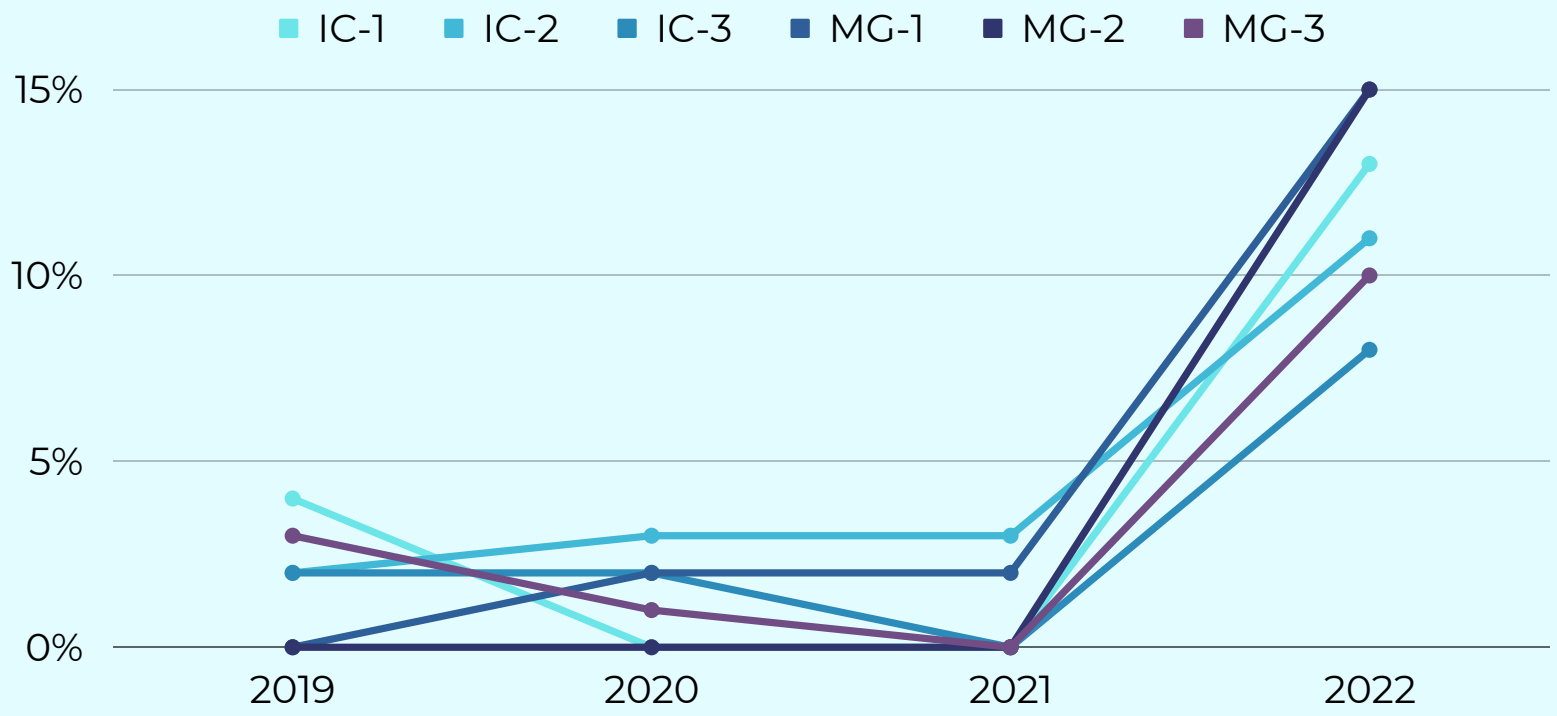
AI Professionals vs. Data Scientists

Burtch Works differentiates professionals that work primarily with structured data (Data Scientists) from those that work primarily with unstructured data (AI Professionals). Both groups analyze data and create statistical models to glean insights and prescribe action, but AI Professionals use sophisticated computer science and programming skills that are not typically used by Data Scientists. This variation in skillset has a marked influence on salaries.

This year our sample included 1,265 Data Scientists and 576 AI Professionals for a total sample of 1,841 data professionals.

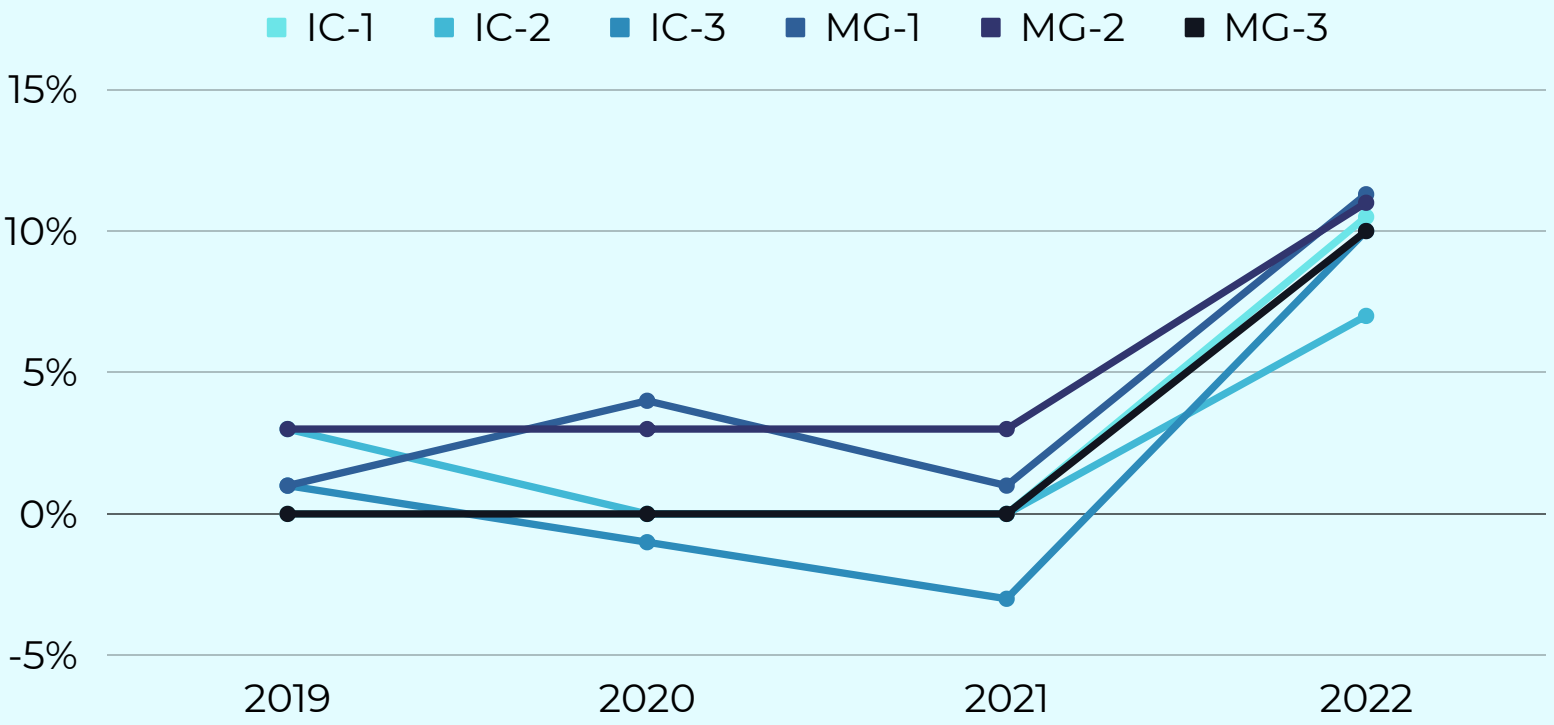
Compensation Changes Over Time

Data Science Professionals - Median Base Salary



Compensation Changes Over Time

AI Professionals - Median Base Salary



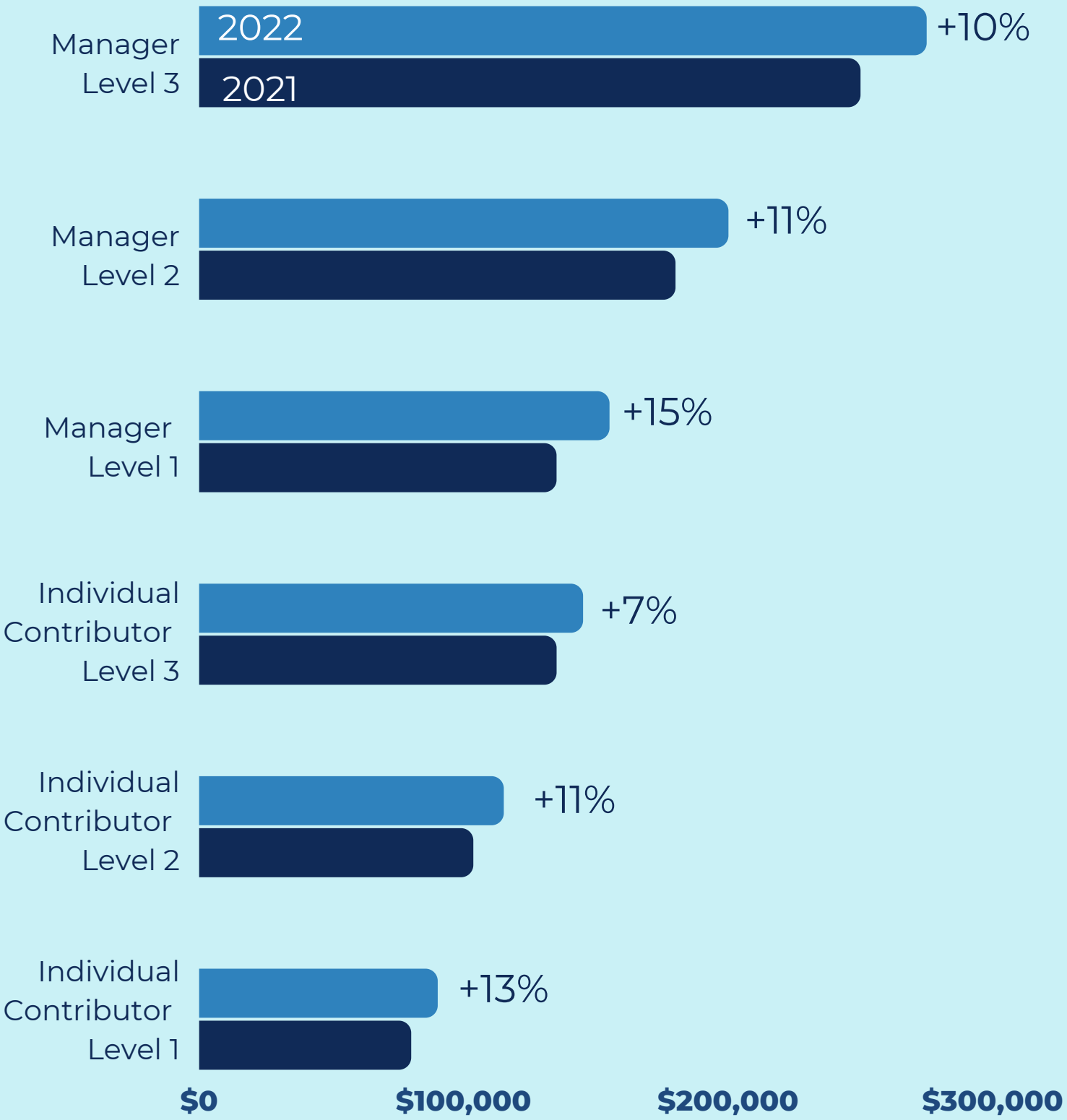
Impacts of Supply & Demand

Burtch Works has been reporting on the salaries of Data Scientists and AI Professionals for 10 years. Our 2022 sample (ranging from May of 2021 - April 2022) has been the largest salary increases we have ever reported, across all job levels.

As can be noted, almost all job levels have been relatively stable in the past with slight increases or decreases year over year, but 2022 samples showcase a significant increase due to the supply and demand mismatch in the Data Science discipline. As financial instabilities emerge, outlook on the near-term future remains uncertain, but we will be sure to report on any changes as they occur.

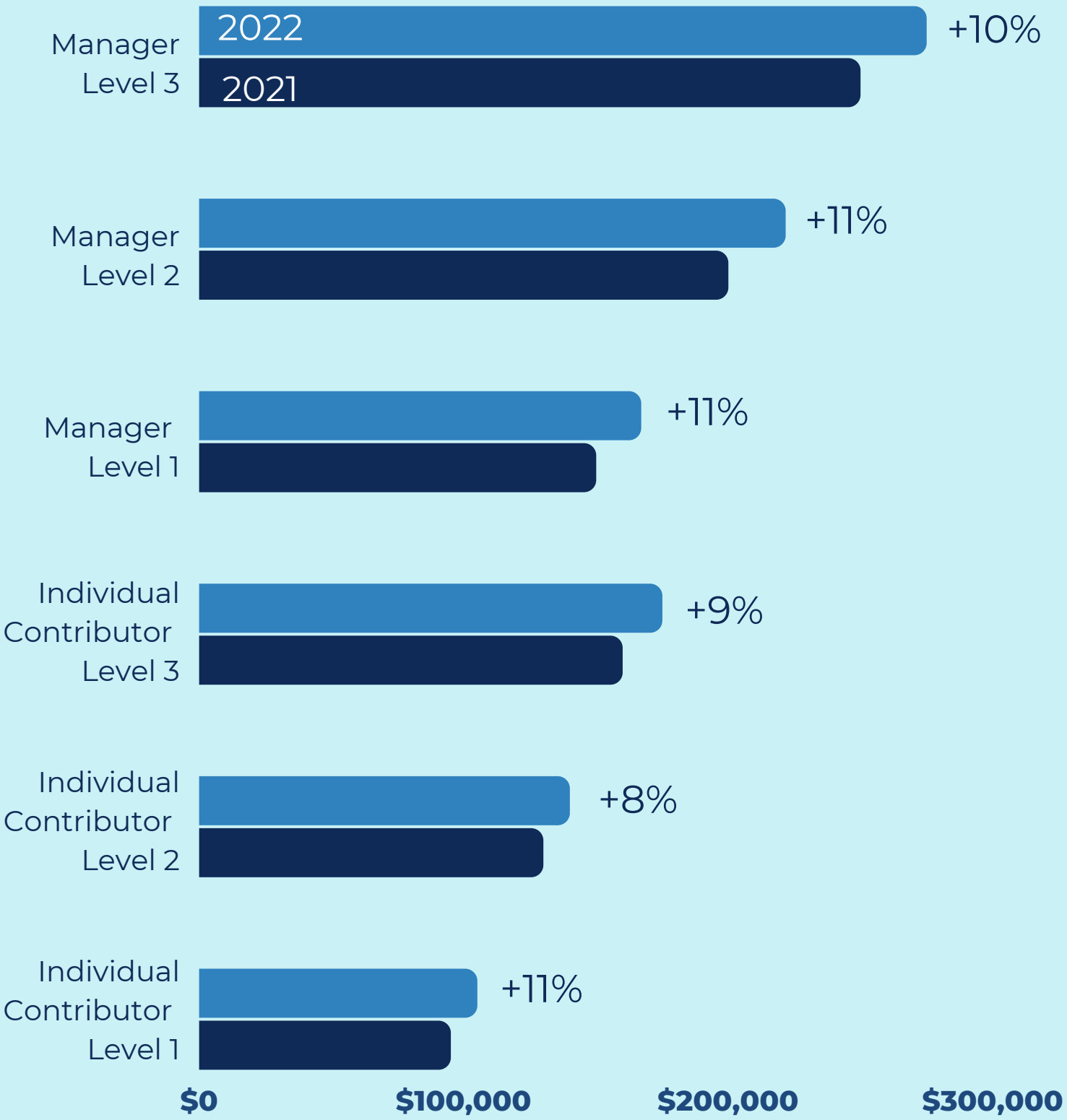
Comparison of **Median Base Salaries** by Job Level for

Data Science Professionals



*See page 45 for job category definitions.

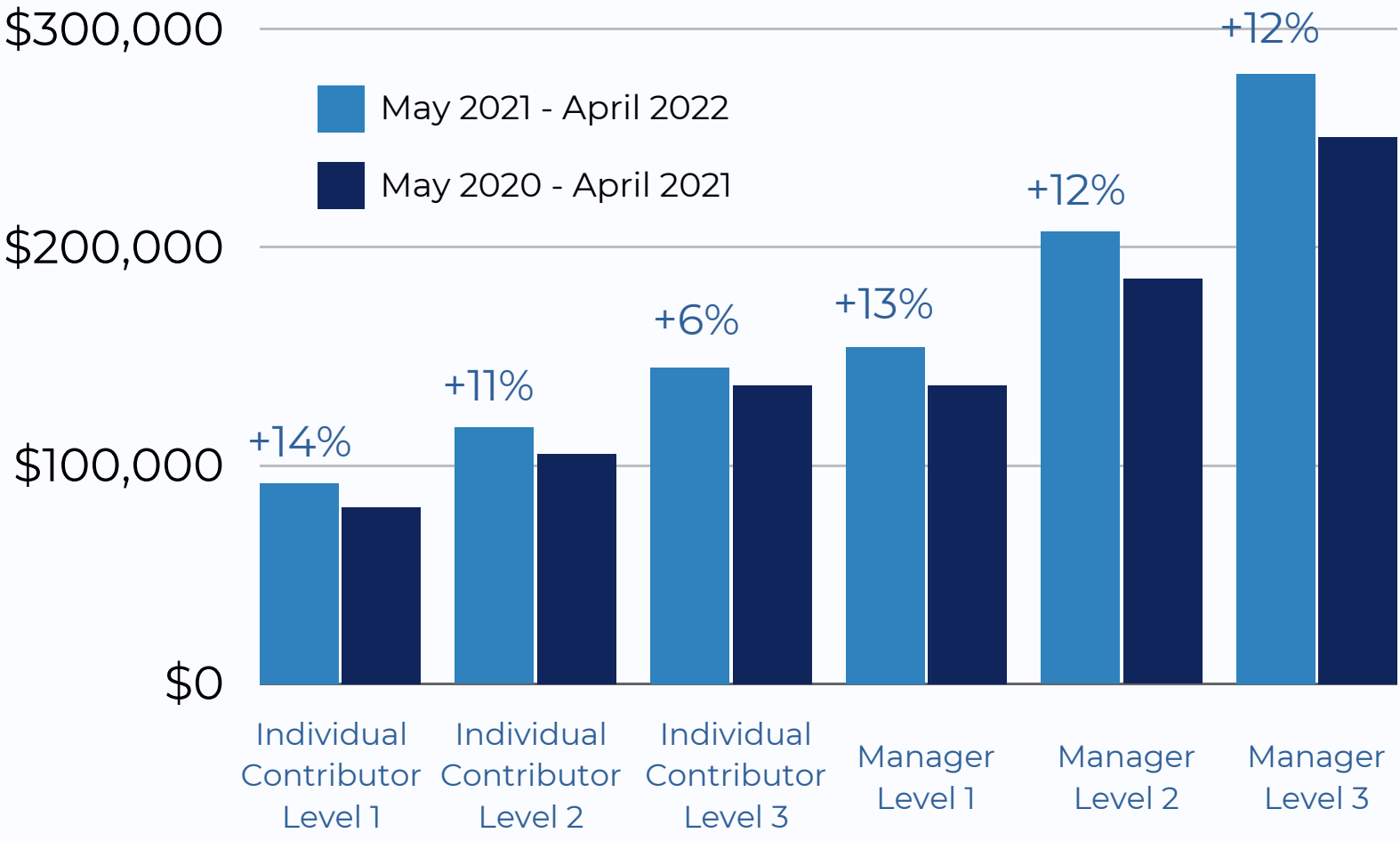
Comparison of **Median Base Salaries** by Job Level for **AI Professionals**



*See page 45 for job category definitions.

Comparison of **Mean Base Salaries** by Job Level for

Data Science Professionals



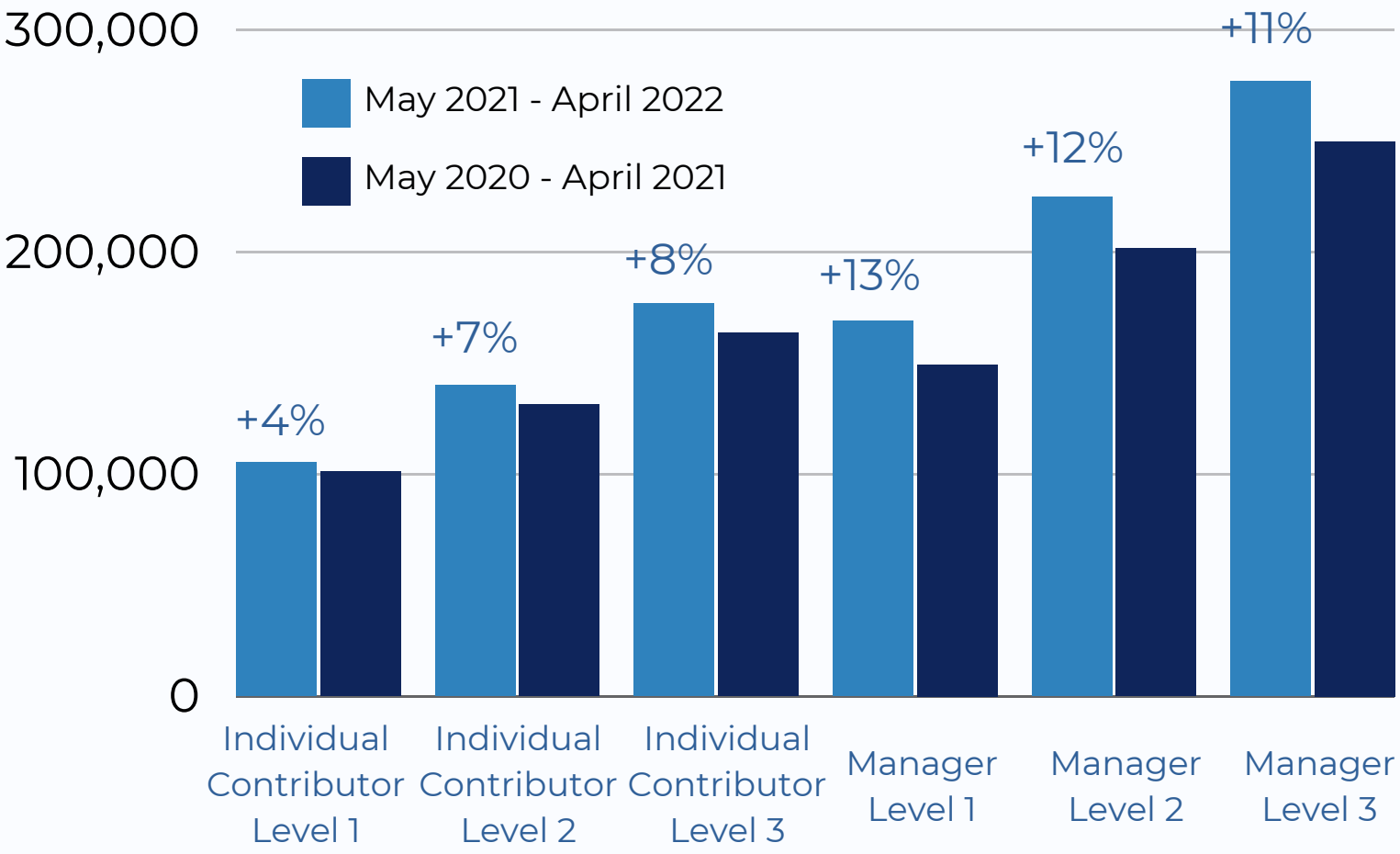
Since our sample period represented such a unique economic time and included a drastic shift from the 2020 pandemic economy to the 2021 recovery, we investigated how this affected average salaries.

As a result of the tight talent market, all levels of Data Science and AI professionals have seen a significant shift in their compensation.

*See page 45 for job category definitions.

Comparison of **Mean Base Salaries** by Job Level for

AI Professionals



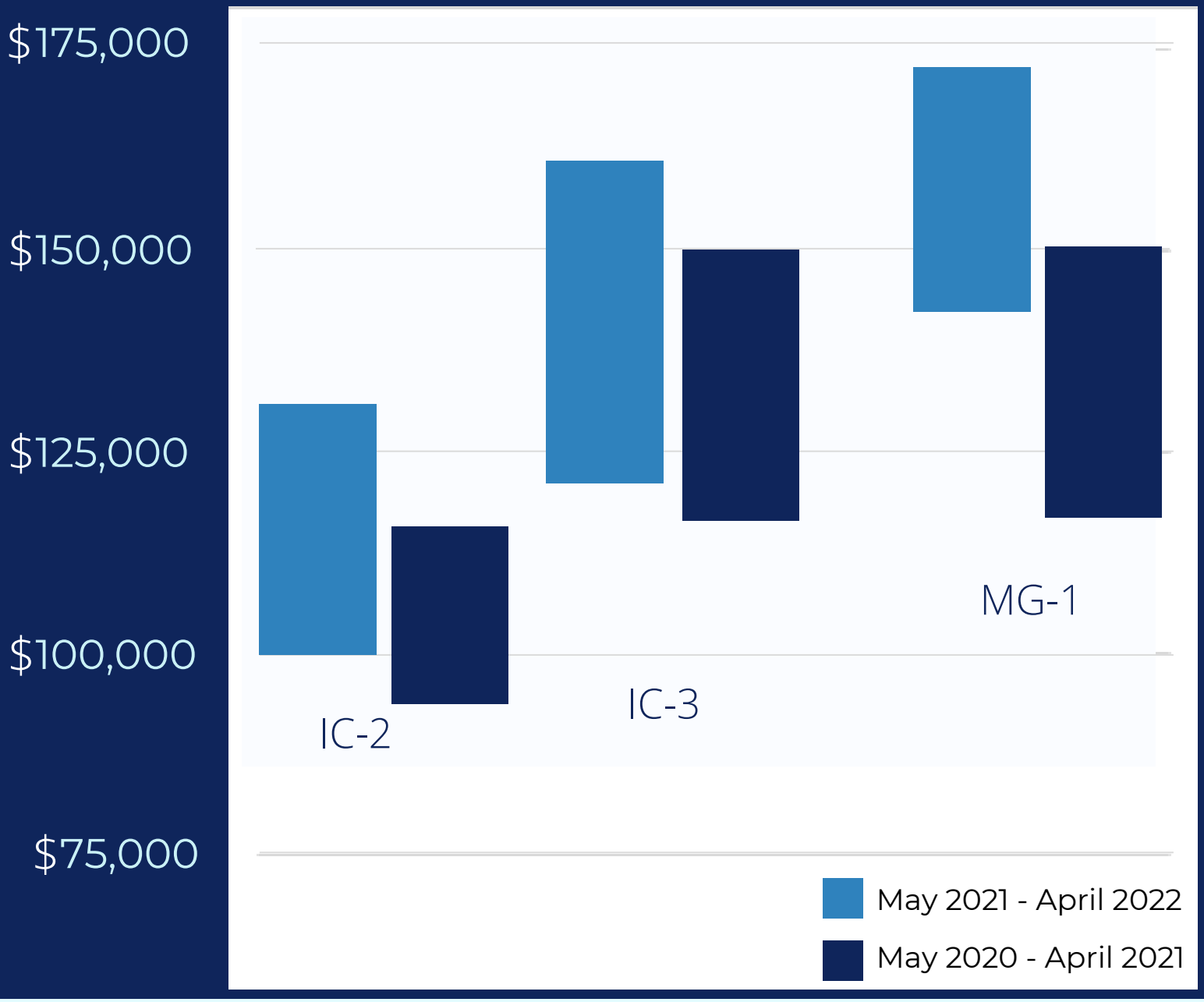
We also investigated the changes in average salaries for data scientists by segmenting our data sample by the pandemic economy period and then the recovery period, which consumed much of 2021.

Similarly, among **AI professionals, there was an upward shift at all levels** though the change for entry level **(IC-1) and (IC-2)** was not as significant. Similar to others in data science, however, **the most notable increases were for across all three levels of managers (MG-1, MG-2 and MG-3).** This is particularly resulting from organizations seeking professionals who have extensive experience and are able to hit the ground running, especially given the Great Resignation and the prioritization of efficiently managing internal teams.

*See page 45 for job category definitions.

Interquartile Ranges

Data Science Professionals

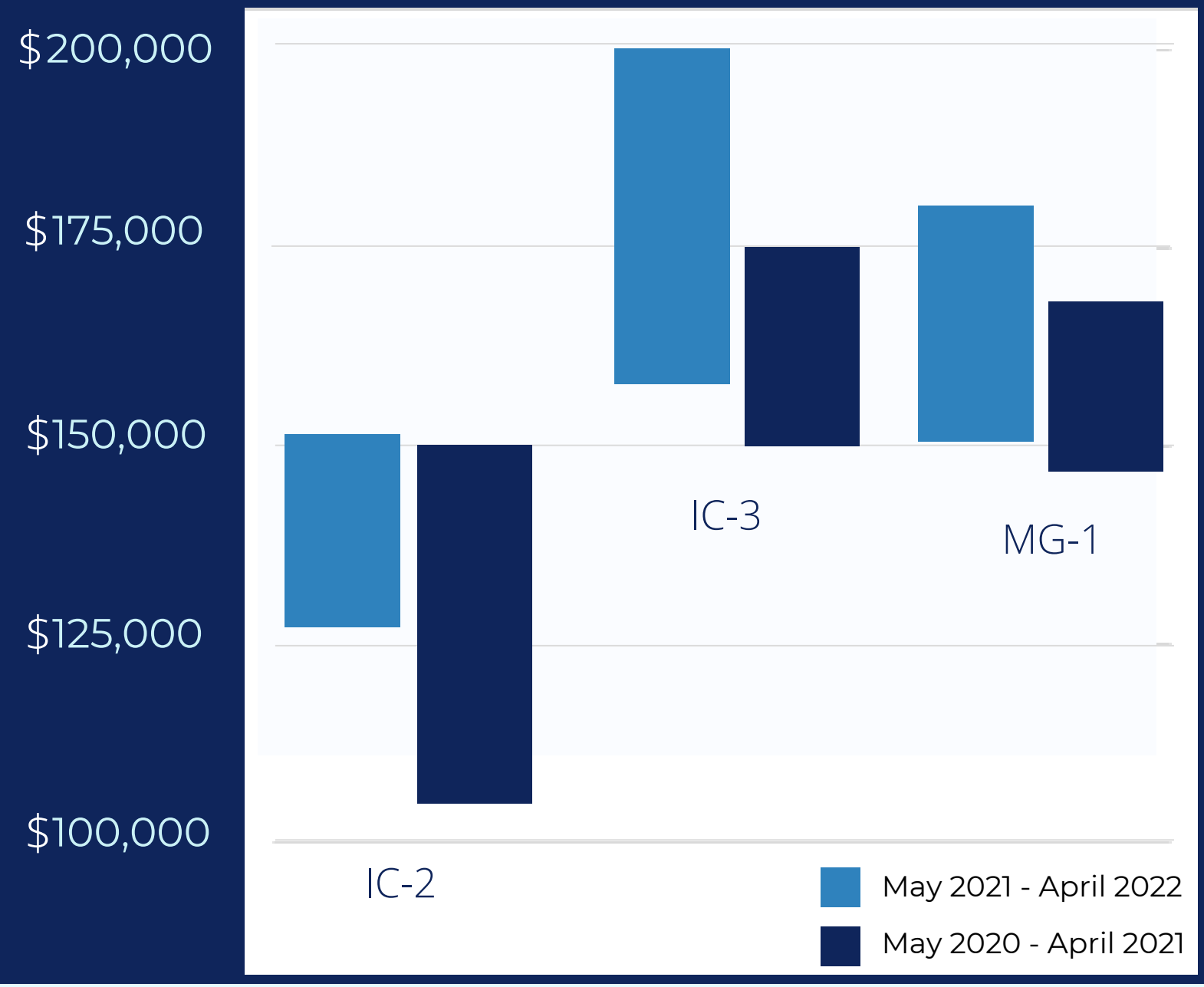


When examining the interquartile ranges (from the 25% quartile to the 75% quartile) for the three job levels where we saw significant growth in average salary (IC-2, IC-3, and MG-1), we can see a positive shift in overall salary ranges when moving from the pandemic economy (much of 2021) to the recovery economy (2022). For all three levels, **there was an upward shift at both the bottom of the range and top.**

*See page 45 for job category definitions.

Interquartile Ranges

AI Professionals



When examining the interquartile ranges (from the 25% quartile to the 75% quartile) for the three job levels where we saw significant growth in average salary (IC-2, IC-3, and MG-1), we can again see a positive shift in overall salary ranges when moving from the pandemic economy (much of 2021) to the recovery economy (2022). For IC-3 and MG-1, **there was an upward shift at both the bottom of the range and top.**

*See page 45 for job category definitions.

Changes in Base Salaries by Job Level for Data Science Individual Contributors

Job Level	Year	25%	Median	Mean	75%	N
Individual Contributor Level 1	2022	$80,000	$90,000	$91,369	$101,475	220
	2021	$72,000	$80,000	$80,486	$87,250	196
	Change	+11%	+13%	+14%	+16%	
Individual Contributor Level 2	2022	$101,600	$115,000	$116,917	$130,000	287
	2021	$90,000	$103,500	$104,916	$115,000	196
	Change	+13%	+11%	+11%	+13%	
Individual Contributor Level 3	2022	$123,300	$145,000	$144,366	$160,000	125
	2021	$120,000	$135,000	$136,252	$150,000	267
	Change	+3%	+7%	+6%	+7%	

Changes in Base Salaries by Job Level for AI Professionals Individual Contributors

Job Level	Year	25%	Median	Mean	75%	N
Individual Contributor Level 1	2022	$95,000	$105,000	$104,690	$115,200	118
	2021	$87,750	$95,000	$100,618	$115,000	34
	Change	+8%	+11%	+4%	+0.2%	
Individual Contributor Level 2	2022	$125,000	$140,000	$139,385	$150,025	224
	2021	$110,000	$130,000	$130,853	$150,000	95
	Change	+14%	+8%	+7%	+0.02%	
Individual Contributor Level 3	2022	$160,000	$175,000	$176,215	$200,000	79
	2021	$149,250	$160,000	$162,995	$175,000	62
	Change	+7%	+9%	+8%	+14%	

*See page 45 for job category definitions.

*Changes in **Base Salaries** by Job Level for **Data Science Managers***

Job Level	Year	25%	Median	Mean	75%	N
Manager Level 1	2022	$139,000	$155,000	$153,915	$170,000	197
	2021	$120,000	$135,000	$136,252	$150,000	103
	Change	+16%	+15%	+13%	13%	
Manager Level 2	2022	$180,200	$200,000	$206,631	$227,000	341
	2021	$165,000	$180,000	$185,073	$201,000	307
	Change	+9%	11%	+12%	+13%	
Manager Level 3	2022	$237,600	$275,000	$279,111	$310,000	95
	2021	$220,000	$250,000	$250,088	$275,000	159
	Change	+8%	+10%	+12%	+13%	

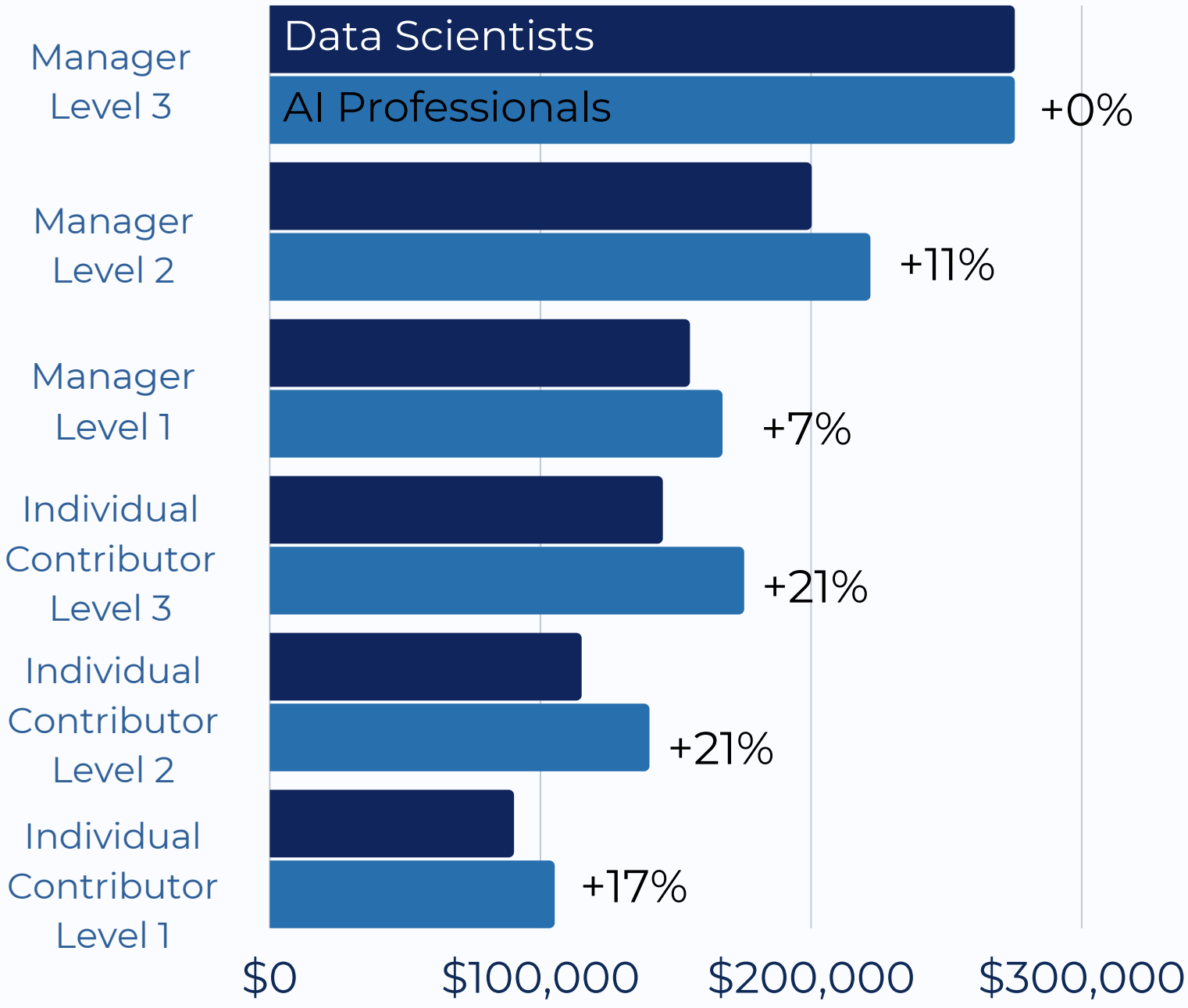
*Changes in **Base Salaries** by Job Level for AI Professional Managers*

Job Level	Year	25%	Median	Mean	75%	N
Manager Level 1	2022	$150,000	$167,000	$168,461	$180,000	49
	2021	$140,000	$150,000	$148,871	$160,000	31
	Change	+7%	+11%	+13%	+13%	
Manager Level 2	2022	$200,200	$221,650	$243,318	$250,000	82
	2021	$180,000	$200,000	$201,162	$220,000	74
	Change	+11%	+11%	+21%	+14%	
Manager Level 3	2022	$250,000	$275,000	$276,225	$300,225	24
	2021	$210,000	$250,000	$249,267	$275,000	43
	Change	+19%	+10%	+11%	+9%	

*See page 45 for job category definitions.

Comparison of **Median Base Salaries** by Job Level for

Data Scientists & AI Professionals



At the IC level, many times AI professionals will have a PhD and command a higher salary, however once these individuals move into management roles the difference between Data Science and AI salaries shrink as management skills become the focus.

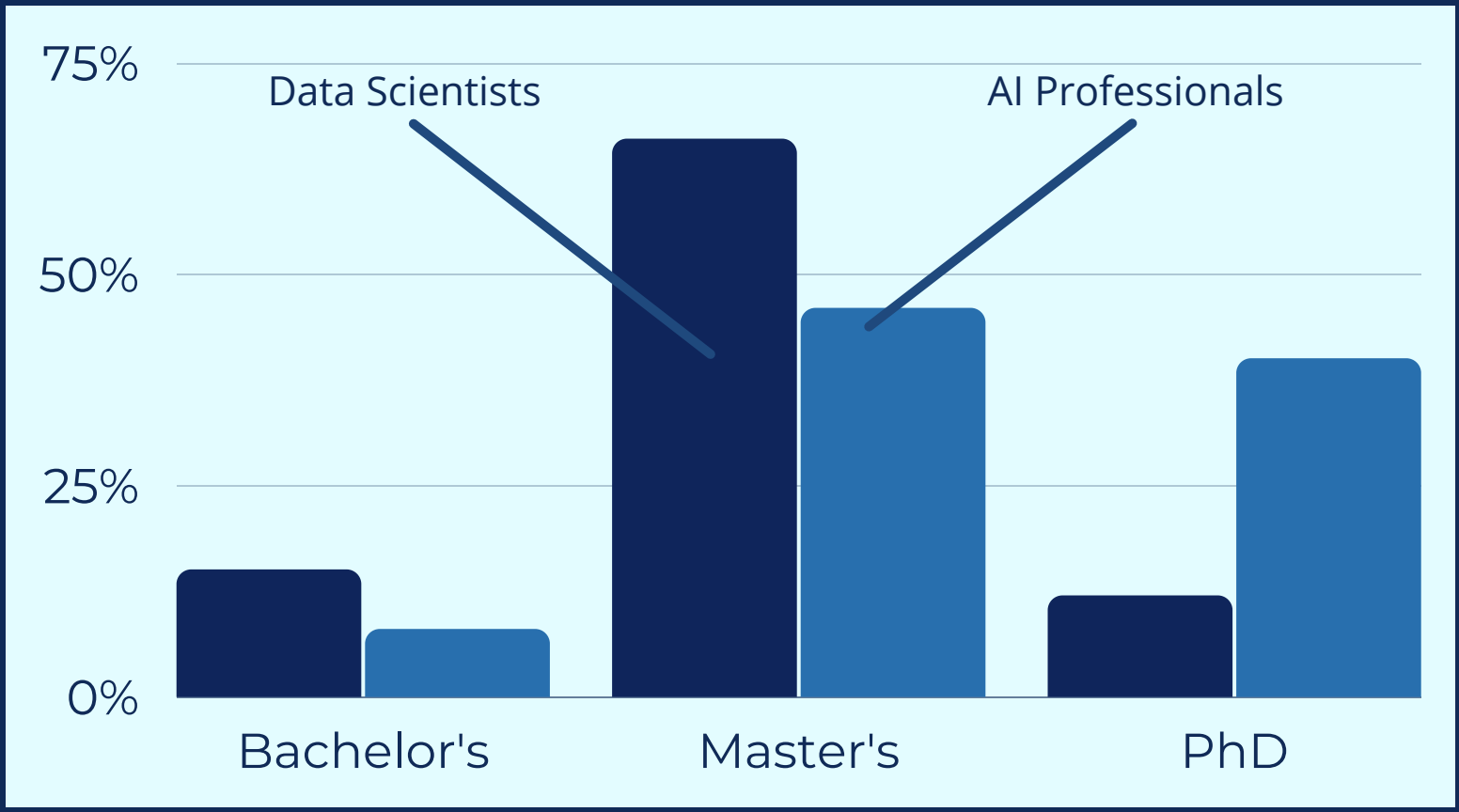
*See page 45 for job category definitions.

Section 3
Demographic Profile

Demographics: Education

- *Most data science and analytics professionals hold an advanced degree (Master's or PhD).*
- *Education level has historically had a marked effect on salary.*
- *AI Professionals are more likely to hold a PhD than other Analytics Professionals.*

Comparison of **Degree Level** (for highest degree earned) for **Data Scientists vs. AI Professionals**

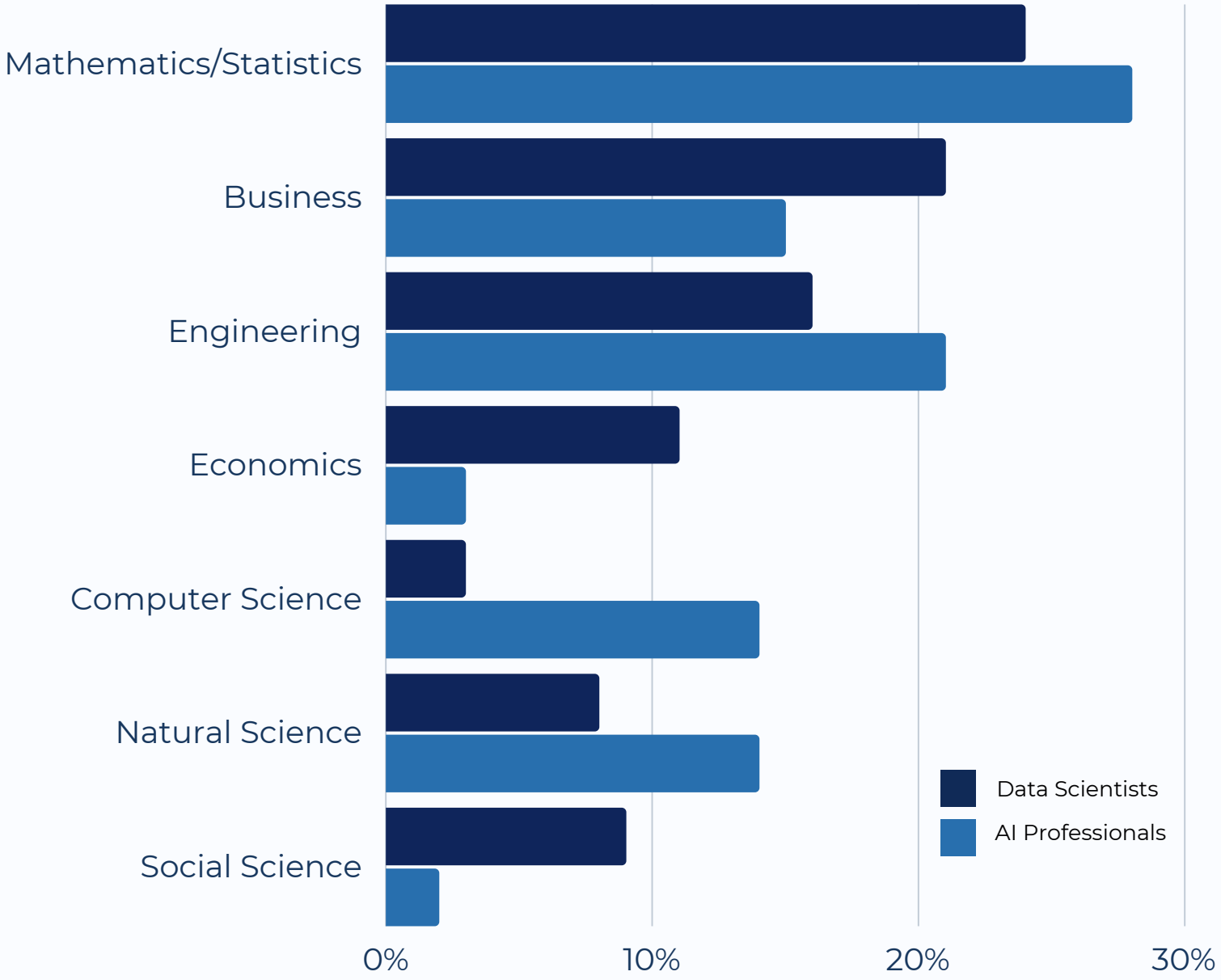


93%
of all professionals surveyed held an **advanced degree**.

12% vs. 40%
The percentage of **PhDs** among **Data Scientists vs. AI Professionals.**

Education: Area of Study

Comparison of **Area of Study** (for highest degree earned) for **Analytics Professionals and Data Scientists**



Mathematics & Business are the most popular area of study for **Data Scientists**

Engineering continues to gain prevalence among both types of professional compared to previous years.

Education: Salaries by Job Level

Professionals with advanced degrees, especially those with PhDs, tend to earn higher salaries than others at the same job level as individual contributors.

*Base Salaries by **Job Level and Degree Level for Data Science Individual Contributors***

Job Level	Education	Base Salary			
		25%	Median	Mean	75%
Individual Contributor Level 1	Master's	$80,100	$90,000	$91,566	$105,000
	PhD	$100,000	$110,300	$102,500	$112,000
Individual Contributor Level 2	Master's	$104,500	$115,200	$117,717	$130,000
	PhD	$111,400	$115,250	$117,316	$128,750
Individual Contributor Level 3	Master's	$123,500	$140,000	$143,304	$158,500
	PhD	$142,575	$155,000	$156,427	$176,250

*Base Salaries by **Job Level and Degree Level for AI Individual Contributors***

Job Level	Education	Base Salary			
		25%	Median	Mean	75%
Individual Contributor Level 1	Master's	$95,100	$105,000	$105,716	$115,200
	PhD	$100,000	$110,000	$108,064	$115,975
Individual Contributor Level 2	Master's	$125,000	$136,000	$138,087	$150,000
	PhD	$130,000	$145,000	$144,707	$155,000
Individual Contributor Level 3	Master's	$150,000	$160,000	$168,370	$185,000
	PhD	$160,000	$180,000	$178,956	$192,500

*See page 45 for job category definitions.

Education: Salaries by Job Level

As managers increase in seniority and management responsibility, degree level has less of an impact on salary. For managers at level 3, the differences in salary mean are not significant.

*Base Salaries by **Job Level and Degree Level for Data Science Managers***

Job Level	Education	Base Salary			
		25%	Median	Mean	75%
Manager Level 1	Master's	$137,000	$150,200	$152,488	$170,000
	PhD	$141,400	$160,100	$163,009	$187,525
Manager Level 2	Master's	$180,000	$200,000	$204,188	$225,000
	PhD	$195,000	$220,000	$218,682	$245,000
Manager Level 3	Master's	$230,000	$260,000	$273,638	$300,200
	PhD	$246,400	$277,500	$281,363	$324,250

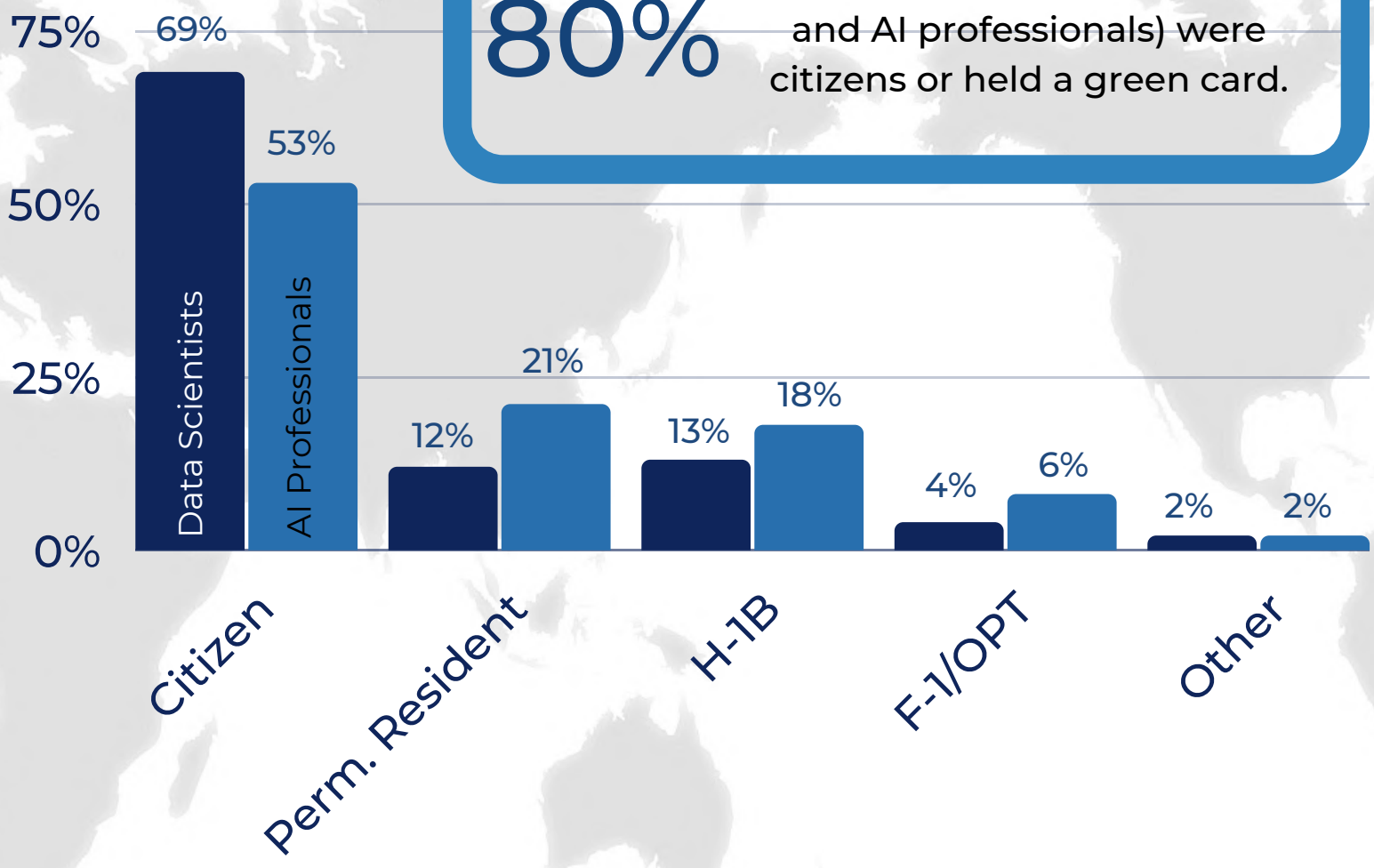
*Base Salaries by **Job Level and Degree Level for AI Managers***

Job Level	Education	Base Salary			
		25%	Median	Mean	75%
Manager Level 1	Master's	$151,500	$165,000	$162,662	$175,025
	PhD	$160,025	$175,000	$175,346	$190,275
Manager Level 2	Master's	$200,275	$221,500	$226,832	$250,000
	PhD	$200,150	$222,650	$223,804	$240,000
Manager Level 3	Master's	$250,000	$275,000	$282,533	$300,300
	PhD	$250,000	$275,000	$276,854	$292,500

*See page 45 for job category definitions.

Demographics: *Residency Status*

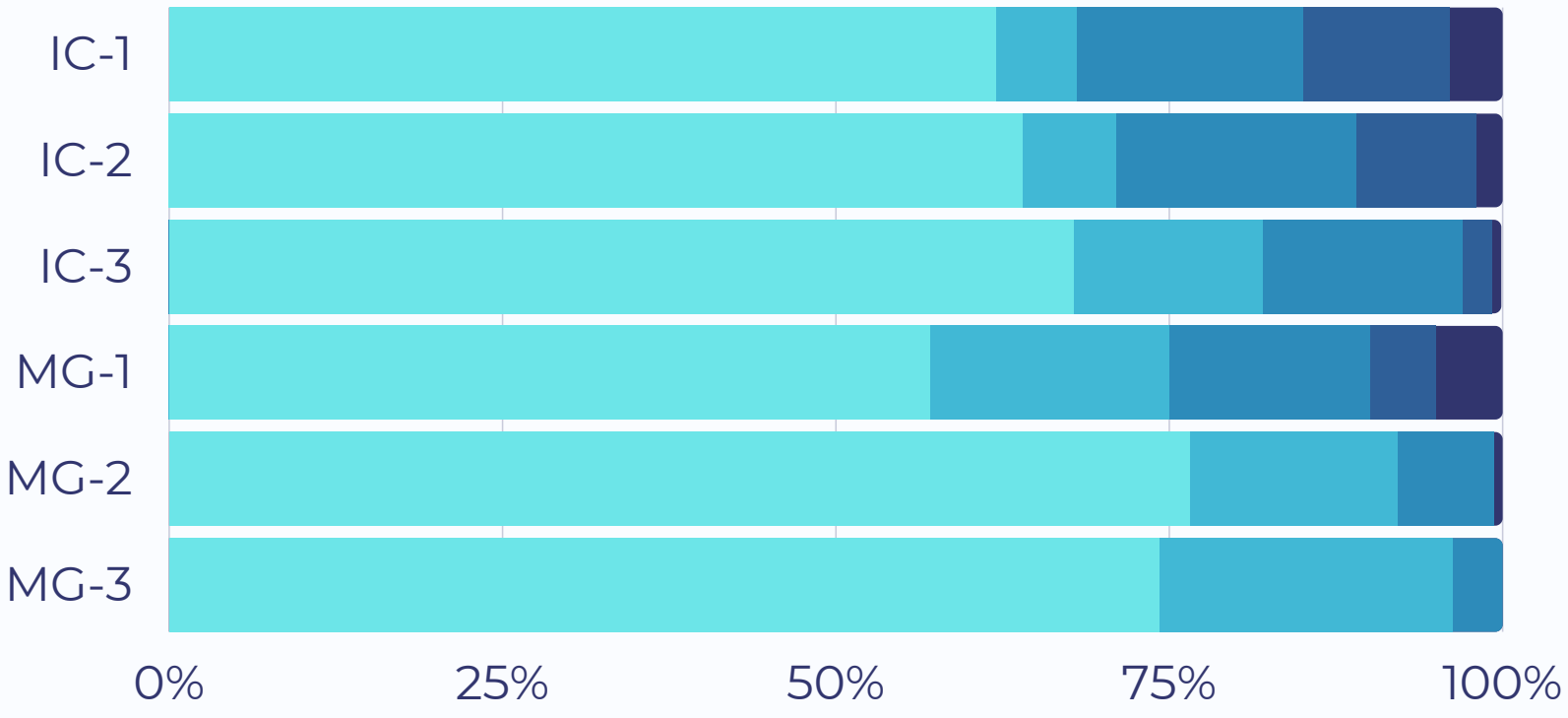
80% of the sample (data scientists and AI professionals) were citizens or held a green card.



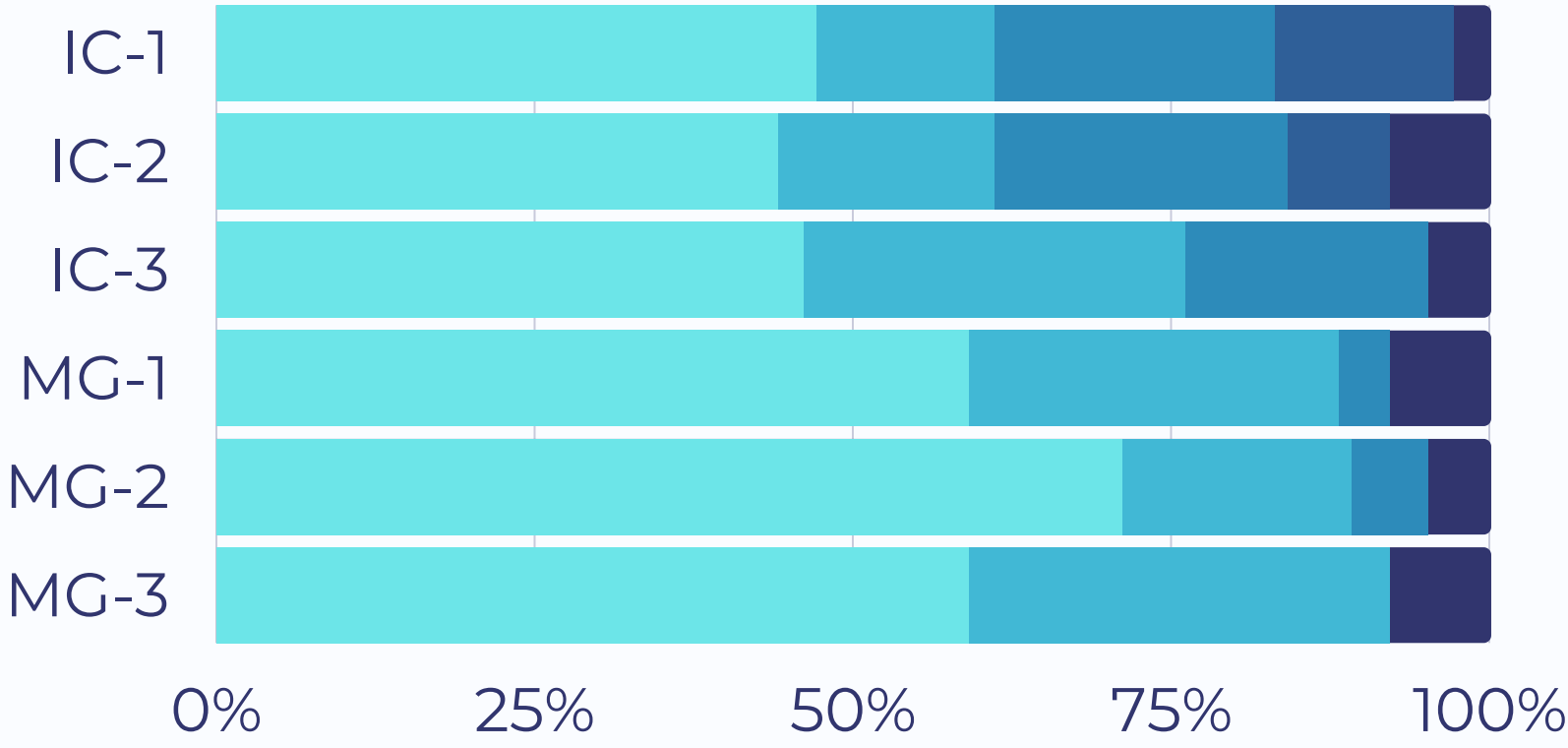
Residency demographics for Data Scientists & AI Professionals

*See page 45 for job category definitions.

Residency demographics by Job Level for Data Scientists



Residency demographics by Job Level for AI Professionals



Salaries by Region

Job Level	Region	Base Salary			
		25%	Median	Mean	75%
Individual Contributor Level 1	Northeast	$85,000	$95,000	$96,162	$110,000
	Southeast	$80,225	$85,200	$87,659	$90,200
	Midwest	$75,100	$82,200	$86,313	$95,100
	Mountain	$85,050	$92,650	$93,150	$103,750
	West Coast	$90,000	$100,000	$102,533	$115,000
Individual Contributor Level 2	Northeast	$110,000	$120,100	$122,925	$135,000
	Southeast	$99,250	$107,500	$108,850	$115,200
	Midwest	$97,400	$110,000	$107,462	$115,200
	Mountain	$101,400	$112,600	$115,103	$133,800
	West Coast	$120,000	$130,100	$130,308	$145,000
Individual Contributor Level 3	Northeast	$130,000	$145,100	$145,819	$160,100
	Southeast	$118,825	$135,500	$135,966	$142,500
	Midwest	$113,000	$132,600	$133,790	$155,000
	Mountain	$146,500	$155,000	$149,333	$155,000
	West Coast	$150,000	$160,100	$164,032	$180,000

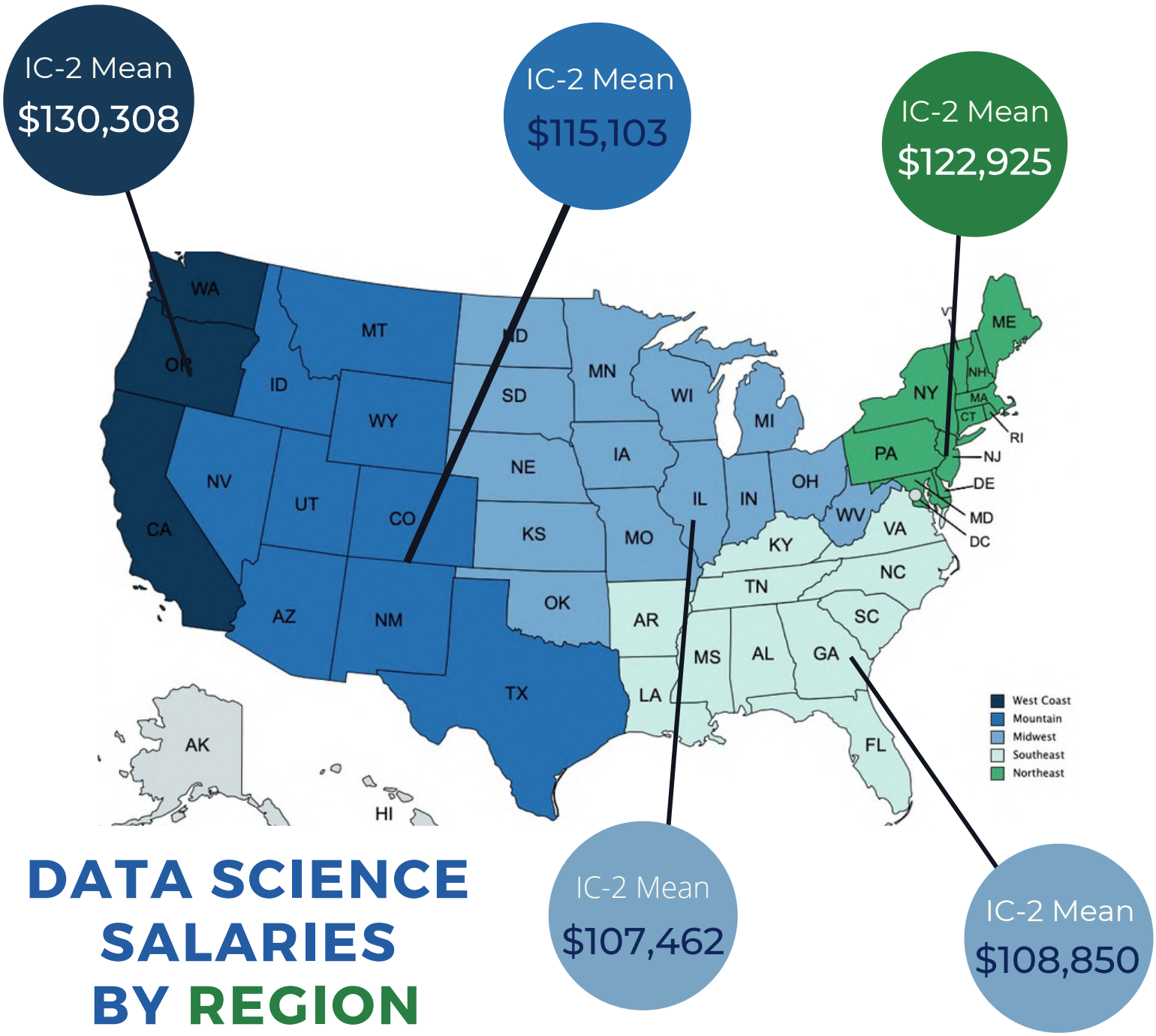
Job Level	Region	Base Salary			
		25%	Median	Mean	75%
Manager Level 1	Northeast	$140,000	$155,200	$155,498	$171,500
	Southeast	$139,250	$150,000	$150,513	$165,000
	Midwest	$128,000	$140,000	$142,289	$160,000
	Mountain	$140,000	$160,,000	$156,123	$175,000
	West Coast	$146,400	$165,100	$162,457	$178,750
Manager Level 2	Northeast	$180,000	$210,000	$210,527	$230,300
	Southeast	$175,025	$197,600	$197,588	$213,750
	Midwest	$182,500	$200,000	$203,608	$222,500
	Mountain	$180,000	$196,500	$201,513	$223,500
	West Coast	$185,000	$200,200	$211,349	$240,050
Manager Level 3	Northeast	$248,750	$295,500	$294,593	$350,000
	Southeast	$240,000	$275,000	$267,527	$297,500
	Midwest	$222,575	$262,500	$270,080	$300,175
	Mountain	$250,150	$350,000	$311,500	$355,100
	West Coast	$211,250	$242,500	$255,866	$281,300

Salaries of Data Science Professionals by Region

The West Coast had the highest mean salary for all job levels.

The Mountain region showed salary medians and means that were fairly comparable to the Northeast (traditionally the second highest earning region).

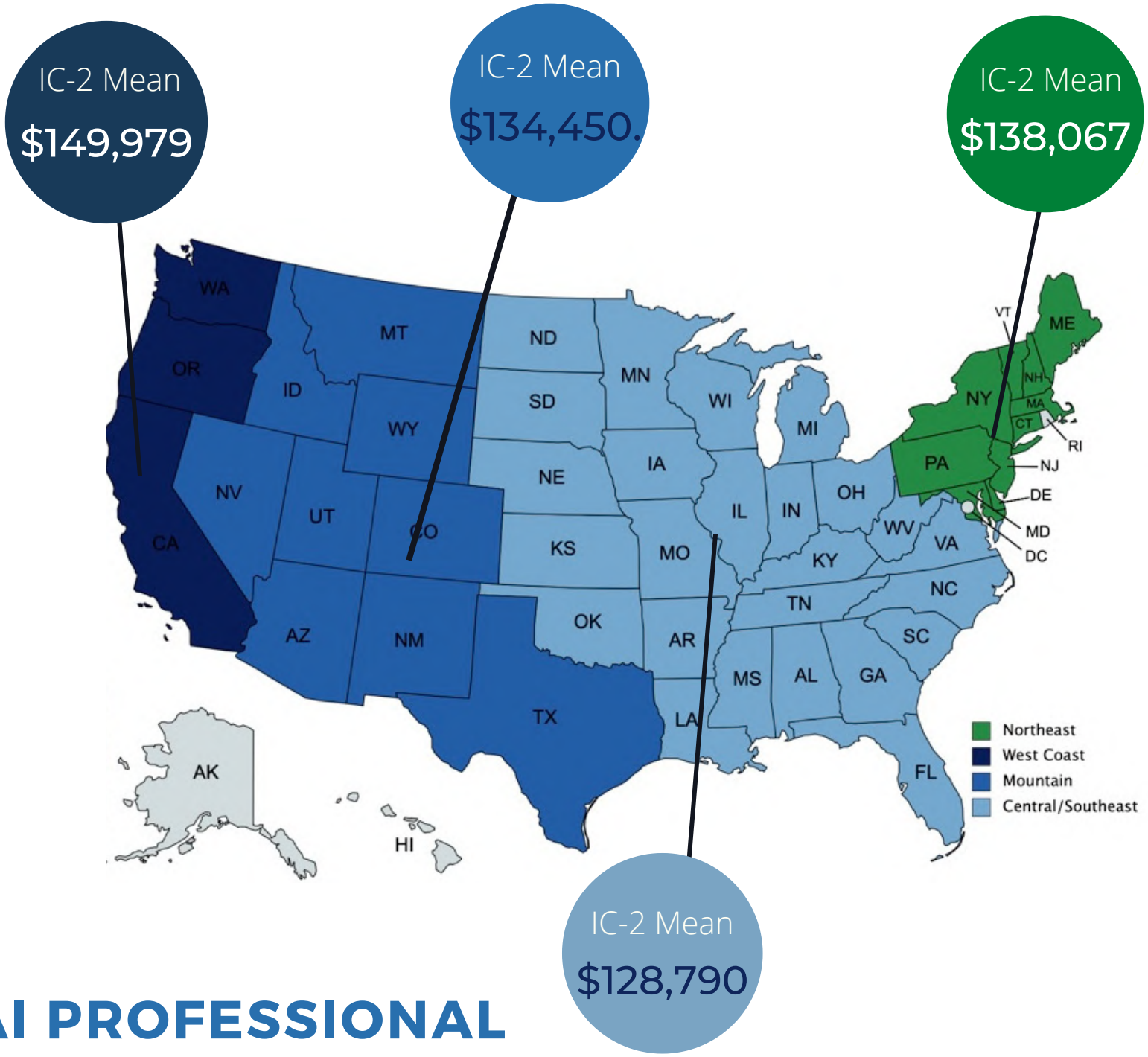
Demographics: *Region*



DATA SCIENCE SALARIES BY REGION

A NATIONAL REVIEW

For Data Scientists, median base salaries on the West Coast were the highest in the nation, followed by the Northeast.



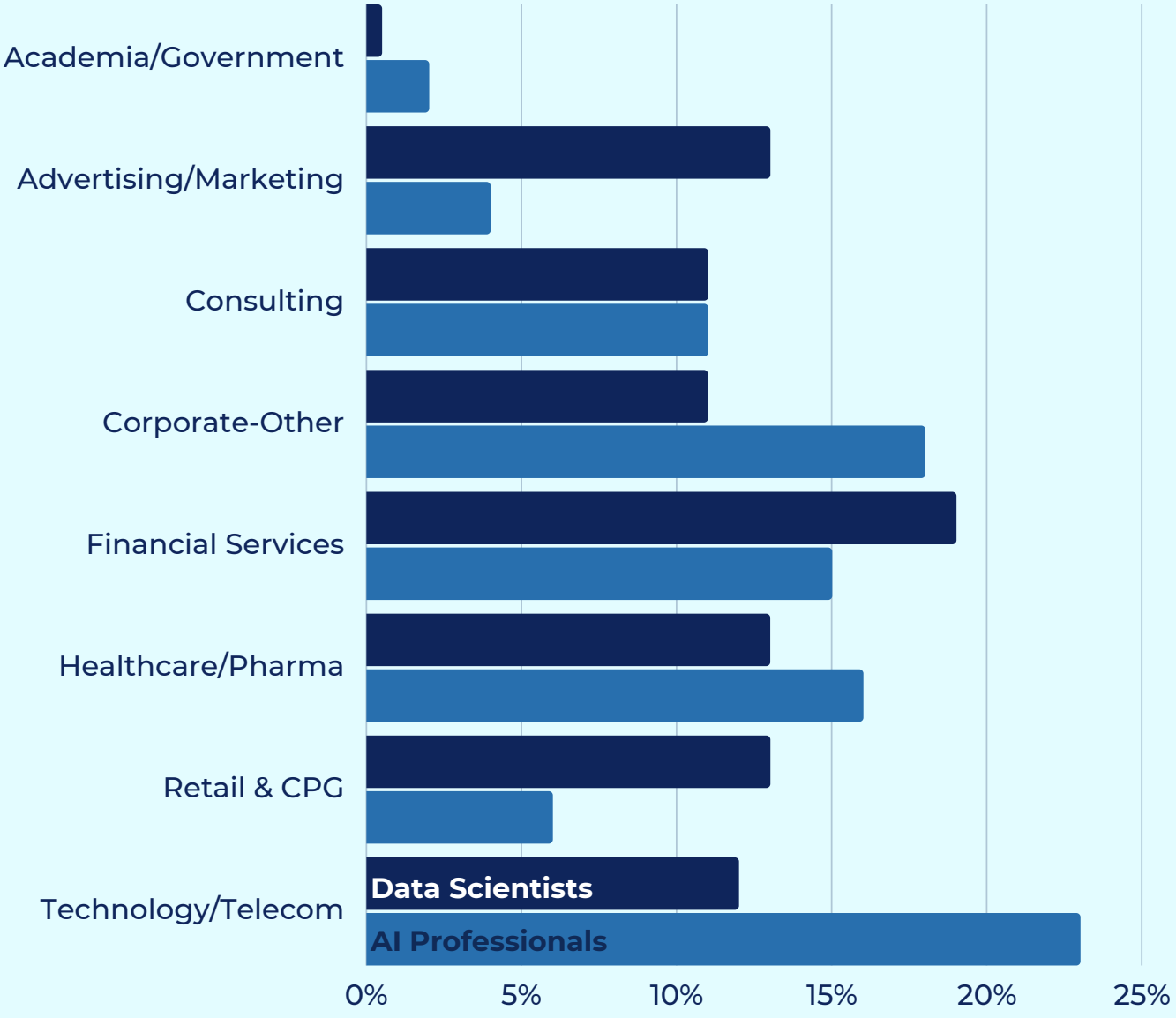
AI PROFESSIONAL SALARIES BY REGION

A NATIONAL REVIEW

- For AI Professionals, due to sample size consideration, we have combined the Southeast and Midwest regions.
- Again, AI Professionals' median base salaries on the West Coast are highest, followed by the Northeast.

Demographics: *Industry*

Comparison of Industry for AI Professionals and Data Scientists



As more industries pursue or expand **digital transformation** efforts in order to survive, there has been a greater diversification in industry representation. Both samples have seen a noticeable increase in Healthcare/Pharma in recent years, as well as in Financial Services when compared to 2021. These diversification trends are likely to continue in the coming years.

Demographics: *Industry*

Base Salaries by Job Level and **Industry for Data Science Individual Contributors**

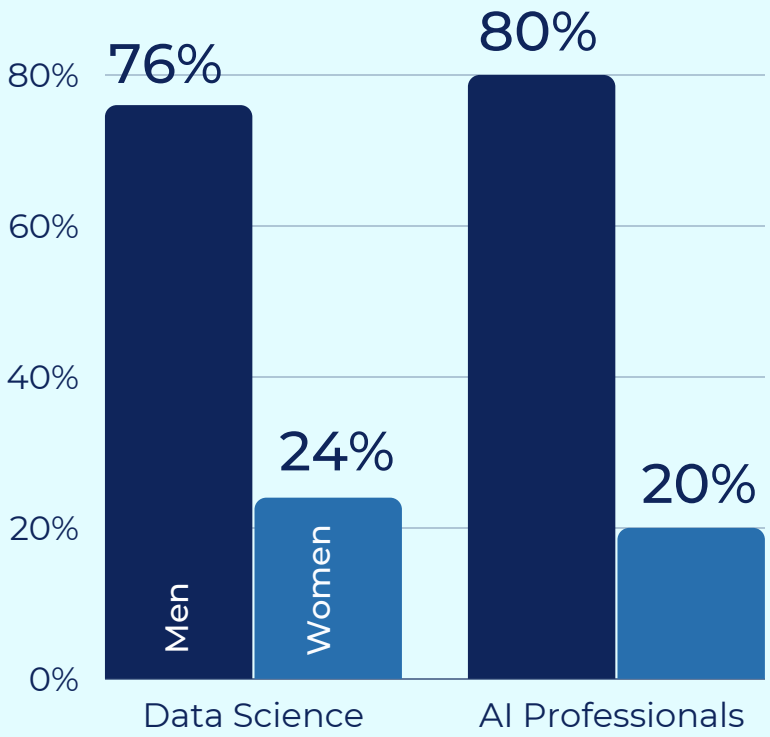
Job Level	Industry	Base Salary			
		25%	Median	Mean	75%
Individual Contributor Level 1	Advertising/Marketing	$76,550	$85,200	$88,054	$97,975
	Consulting	$80,200	$90,000	$94,720	$110,000
	Financial Services	$80,000	$90,000	$90,727	$100,100
	Healthcare/Pharma	$80,100	$85,300	$89,578	$102,500
	Retail & CPG	$96,300	$105,000	$102,625	$111,325
	Technology/Telecom	$105,000	$105,000	$105,000	$105,000
	Other Corporate	$81,325	$82,550	$82,550	$83,775
Individual Contributor Level 2	Advertising/Marketing	$100,000	$110,000	$111,304	$118,800
	Consulting	$106,250	$120,000	$119,976	$130,000
	Financial Services	$102,500	$115,000	$113,836	$120,100
	Healthcare/Pharma	$105,000	$115,200	$118,179	$130,000
	Retail & CPG	$110,000	$115,200	$117,438	$130,000
	Technology/Telecom	$102,600	$120,000	$124,153	$147,500
	Other Corporate	$100,000	$112,600	$114,016	$130,000
Individual Contributor Level 3	Advertising/Marketing	$120,050	$145,000	$137,754	$152,500
	Consulting	$150,000	$160,000	$163,107	$180,000
	Financial Services	$125,000	$138,000	$138,944	$150,200
	Healthcare/Pharma	$118,500	$140,000	$140,506	$160,000
	Retail & CPG	$147,500	$150,000	$148,750	$151,250
	Technology/Telecom	$145,100	$150,000	$149,060	$155,000
	Other Corporate	$120,000	$155,000	$146,923	$170,000

Demographics: *Industry*

Base Salaries by Job Level and **Industry for Data Science Managers**

Job Level	Industry	Base Salary			
		25%	Median	Mean	75%
Manager Level 1	Advertising/Marketing	$130,000	$157,500	$152,040	$170,000
	Consulting	$150,000	$170,000	$168,776	$184,000
	Financial Services	$130,000	$145,000	$149,002	$170,000
	Healthcare/Pharma	$145,000	$160,000	$156,162	$170,000
	Retail & CPG	$135,000	$150,000	$145,733	$150,000
	Technology/Telecom	$163,900	$175,000	$169,200	$178,750
	Other Corporate	$140,150	$155,100	$151,320	$162,250
Manager Level 2	Advertising/Marketing	$190,100	$210,000	$ 212,867	$230,100
	Consulting	$180,000	$200,200	$206,158	$220,000
	Financial Services	$180,000	$200,000	$199,508	$223,000
	Healthcare/Pharma	$180,000	$210,000	$211,491	$244,000
	Retail & CPG	$182,750	$200,000	$208,159	$230,000
	Technology/Telecom	$192,600	$250,000	$235,314	$272,500
	Other Corporate	$187,500	$205,000	$208,135	$222,500
Manager Level 3	Advertising/Marketing	$237,600	$245,200	$271,000	$292,650
	Consulting	$280,200	$280,200	$280,200	$280,200
	Financial Services	$230,000	$275,000	$280,600	$300,150
	Healthcare/Pharma	$242,500	$275,500	$275,992	$311,325
	Retail & CPG	$250,300	$300,000	$296,946	$350,000
	Technology/Telecom	$220,000	$225,000	$250,000	$267,500
	Other Corporate	$223,750	$277,500	$278,333	$307,250

Demographics: *Gender*



Data Science

For Data Scientists, this year's sample was 76% men and 24% women, showing a very slight decrease in women from **2021 where 25%** of the sample was women and **2019 where 26%** of the sample was women.

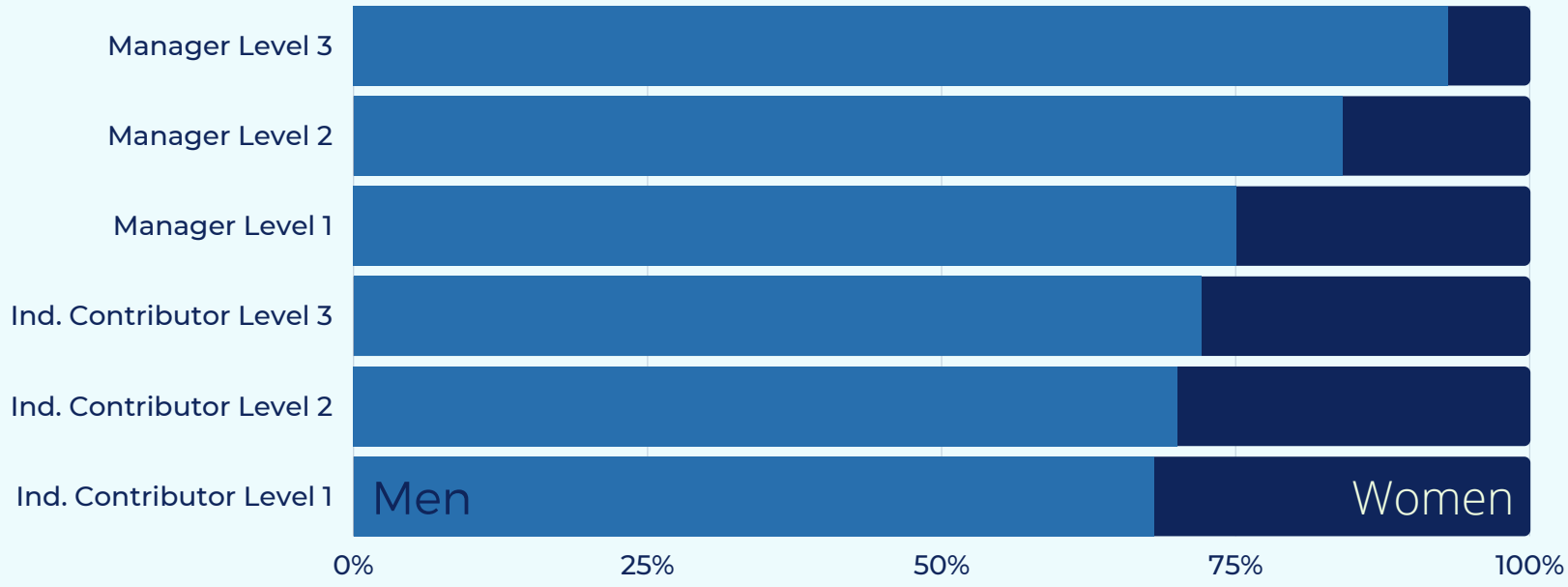
AI Professionals

For AI Professionals, this year's sample was 80% men and 20% women showing increases from 2021 (17%), 2020 (18%), and 2019 (17%). Women continue to make gradual inroads among AI Professionals, but more male candidates are also attracted to the discipline so demographic shifts have been gradual.

Similarly to Data Science, individual contributors showed the largest percentage of women among AI Professionals.

Sample sizes of women in at the various job levels were too small amongst AI Professionals.

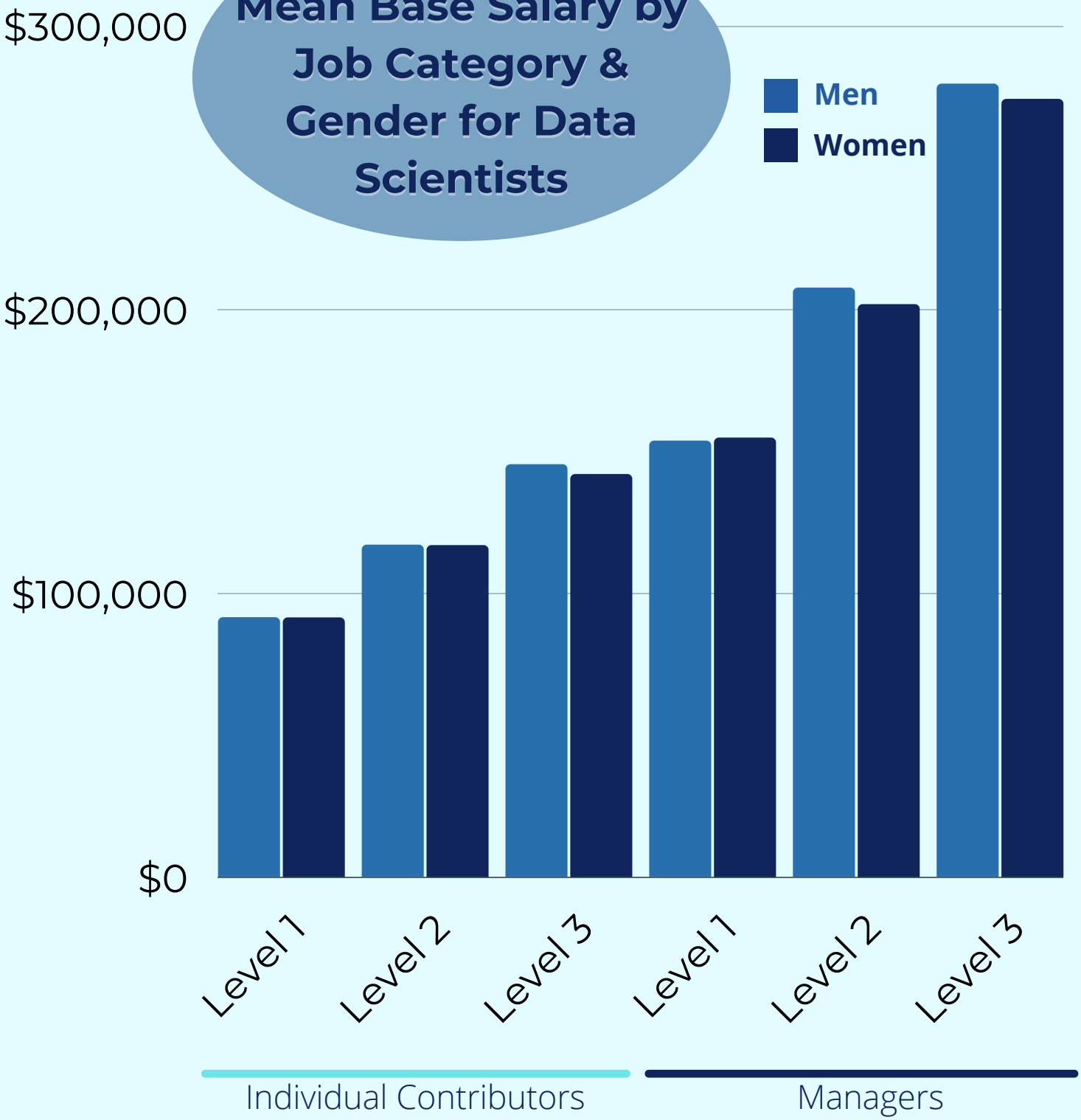
Distribution of Data Scientists by Gender and Job Level



Similarly to previous years, the proportion of women among Data Scientists is highest at the junior levels.

Women become less prevalent among high-level individual contributors and senior managers.

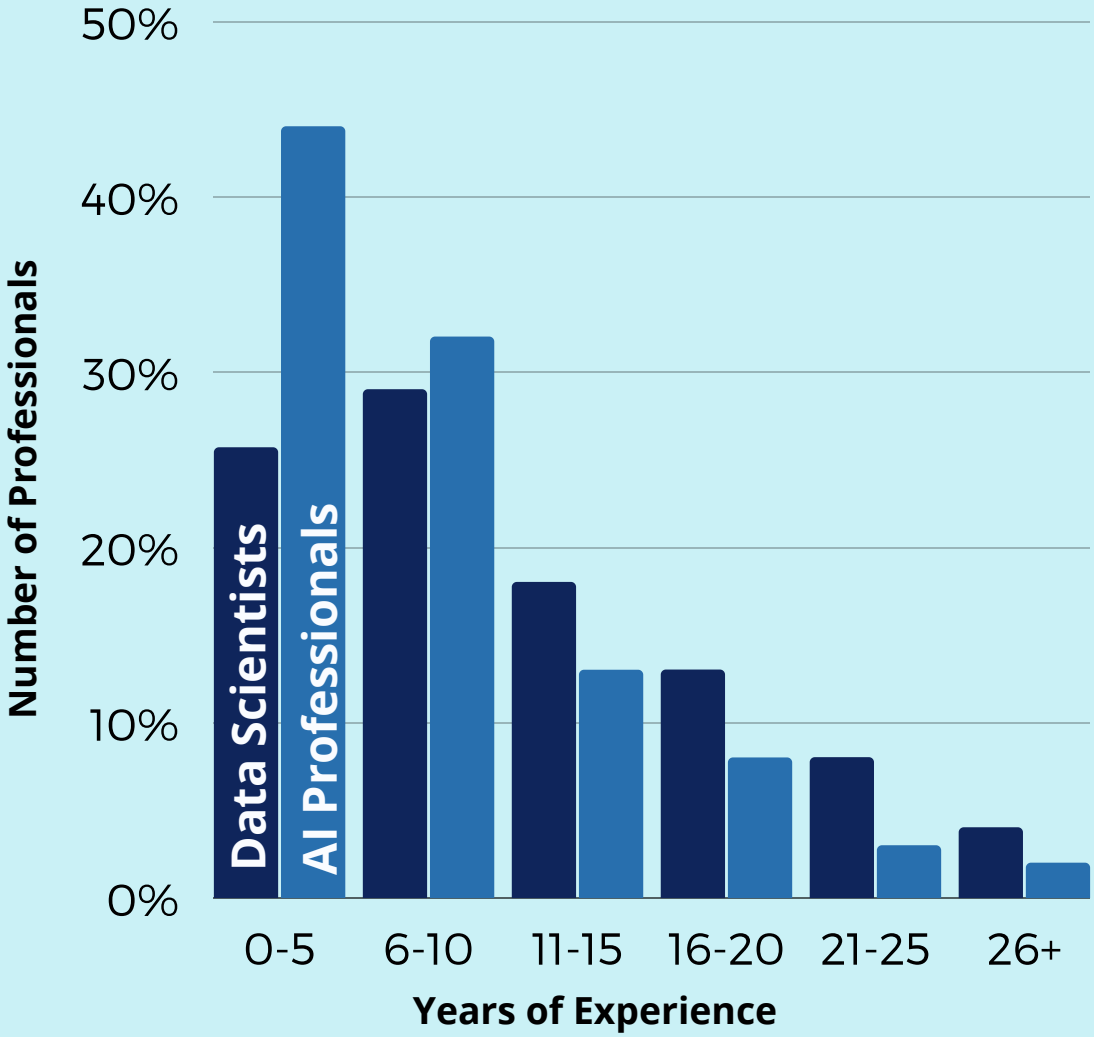
Mean Base Salary by Job Category & Gender for Data Scientists



Women at most levels had a similar mean salary as compared to men,
Level 2 and Level 3 managers showed a *slight* difference.

Demographics:

Years of Experience

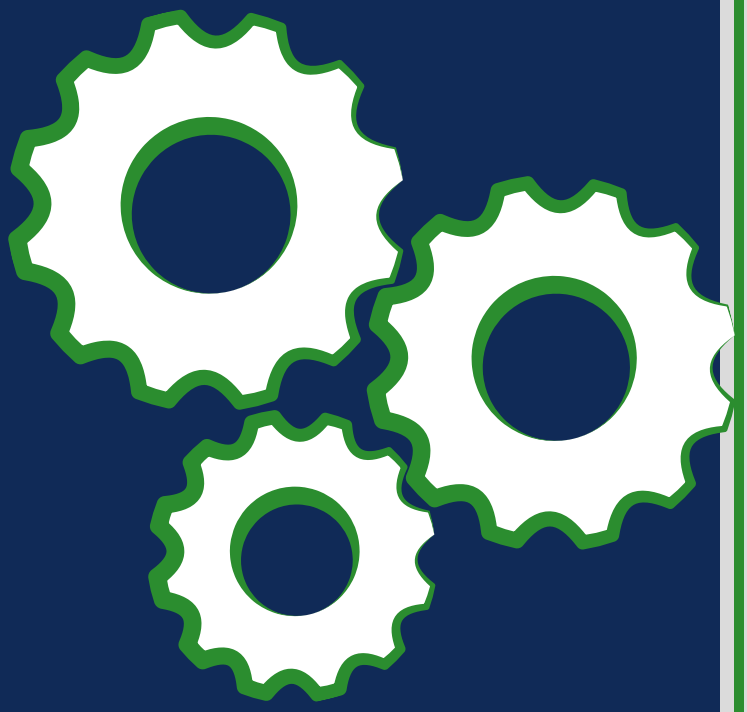


Data Science Professional	
Median-	9 years
Mean-	10.9 years

AI Professionals	
Median-	6 years
Mean-	8 years

Note: The recruiters at Burtch Works do not ask the age of the professionals with whom they work. However, they do ask them for their years of work experience, which is highly correlated with age, and shown above is the distribution of Data Scientists and Analytics Professionals by years of experience. However, salary information is not shown here, because salaries are indirectly related to years of experience through job category.

Section 4
Appendices



Appendix A:
Study Objective & Design

The Sample

This sample contains a total number of 1,841 data professionals (1,265 data scientists and 576 AI professionals) of the approximately 60,000 quantitative professionals with whom Burtch Works maintains contact. Burtch Works collected the data for this study during interviews conducted over the months immediately following the period of interviews for the 2021 study, with data collection ending in April 2022. Professionals were included in the sample only if (1) they satisfied Burtch Works' criteria for AI professionals and data scientists, and (2) Burtch Works obtained complete information about that individual's compensation, demographic, and job characteristics.

How Changes in Compensation Were Measured

While some of the 1,841 professionals in this sample were also in the samples for our previous studies (published annually since 2013), others were not. Therefore, changes in compensation were not measured by differentiating current compensation and compensation reported for the previous study and then taking medians (and other percentiles) of the differences. **Instead, changes were measured by comparing medians (and other percentiles) of current compensation to those reported in last year's study.**

Study Objective

This report is a follow-up to last year's report: The Burtch Works Study: Salaries of Data Scientists and Predictive Analytics Professionals, which was published in May 2021. Its goals are to show (1) current compensation of Analytics Professionals and Data Scientists and how it varies, and (2) how their compensation has changed since last year's report. By continuing to interview large numbers of Analytics Professionals and Data Scientists annually, Burtch Works can show both short-term and long-term trends in the demographic attributes of quantitative professionals and their compensation. Additionally, analyzing AI Professionals (previously referred to as Analytics Professionals) and Data Scientists side-by-side highlights the distinctions between the groups that affect salary.

Why *The Burtch Works Studies* Are Unique

The Burtch Works Studies: Salaries of Data Scientists & Artificial Intelligence (AI) Professionals contain highly anticipated salary and demographic data for Data Scientists and other AI Professionals, and are unique because:

- ***Burtch Works' studies focus solely on Data Scientists and AI Professionals –*** *The study samples include only professionals who are currently Data Scientists or AI professionals, and exclude professions that other salary reports may include, such as business intelligence, information technology, and consumer insights.*

- ***Burtch Works' studies distinguish between Data Scientists and other AI Professionals –*** *The study separates AI Professionals (who typically work with unstructured or streaming data) from other Data Scientists because of their more specialized skillset. By comparing the two groups, the study shows how this distinction affects salary.*

- ***Burtch Works obtains this data by interviewing Data Scientists and AI Professionals –*** *Instead of relying on data provided by human resources departments or from a self-reported online survey, Burtch Works interviews every professional individually. An important advantage of the interview process is that Burtch Works recruiters can obtain information about these quantitative professionals that is not usually provided by human resources departments that may affect their compensation, such as education and residency status. Additionally, because of their nuanced understanding of the profession, recruiters can obtain corrections or clarifications when information provided does not seem credible.*

- ***Burtch Works' salary studies show how compensation varies by job level, region, industry, gender, and education –*** *The sample size is large enough to show compensation data, collected over the past year, at a granular level. Further long-term trends are illuminated with each consecutive report.*

We have altered our nomenclature to better reflect the titles utilized by companies in the hiring market, along with distinguishing factors that separate Data Scientists from Artificial Intelligence (AI) Professionals.

Identifying Data Scientists & AI Professionals

Data Scientists apply sophisticated quantitative skills to very large sets of data describing transactions, interactions, or other behaviors to discern patterns in those behaviors and to prescribe actions for their firms. What distinguishes them from other quantitative professionals, for instance traditional financial analysts or web analytics professionals, is the volume and type of data with which they work. AI Professionals are analyzed separately in this report because they typically operate on very large sets of unstructured data, requiring additional computer science skills, while traditional/other Data Scientists usually work with more structured (tabular) data. Burtch Works includes the analysis of AI Professional compensation side-by-side with other Data Scientists to highlight the distinction between the two groups.

To identify AI Professionals, Burtch Works uses these criteria:

1. Educational Background

Data Scientists typically have a degree – usually an advanced degree (a Master's or PhD) – in a quantitative discipline such as Applied Mathematics, Statistics, Economics, or Operations Research. Some professionals with an MBA are also Data Scientists if their MBA program had a quantitative emphasis.

AI Professionals are even more likely to have an advanced degree, such as a Master's or PhD, than Data Scientists. These degrees are typically in a quantitative discipline, such as Computer Science, Physics, Engineering, Applied Mathematics, Statistics, Economics, or Operations Research.

Note: New educational options include data science degree programs, MOOCs (massive open online courses), and bootcamps which continue to take hold in the quantitative community. Some professionals from related careers or fields of study have successfully pivoted into data science and analytics roles through premier bootcamps and mid-career Master's programs.

2. Skills

Data Scientists are proficient users of analytic tools for discerning patterns in data. Also, they can use one or more tools for operating on large data sets (see criterion 3), such as Python, R, and SAS. They may also have some experience with other business and visualization tools.

AI Professionals have expert knowledge of statistical and machine learning methods using tools such as Python and R, with predictive analytics still at the core of the discipline. AI Professionals are usually proficient users of relational databases such as SQL, Big Data infrastructures like Spark and Presto, cloud computing platforms such as AWS, GCP, and Azure. They may also use TensorFlow and deep learning techniques, signal processing, and visualization.

3. Dataset Size

Data Scientists: The size of the datasets that data scientists work with are measured in gigabytes or occasionally larger. These datasets are typically structured.

AI Professionals typically work with datasets that are measured in gigabytes or terabytes, usually too large to be housed in local memory, and may work with continuously streaming data. These datasets are typically unstructured.

4. Job Responsibilities

Data Scientists have job responsibilities in the following areas:

Analytical Database Marketing – Studies existing customers using methods such as customer segmentation, campaign targeting and effectiveness, propensity modeling, and customer lifetime value analysis.

Credit Risk Analytics – Measures consumer, enterprise, and market risk levels. Results of analyses might impact the price of product, such as the interest rate for a credit card or its availability, as in the case of a loan.

Deep Learning – A type of machine learning that is essentially a neural network with three or more layers, which help to "learn" from large amounts of data, often providing better results that a neural network with just one or two layers.

Geospatial Analytics – Analyzes data and makes recommendations around store locations or other physical location decisions.

People Analytics – Analyzes personnel-related business problems such as talent retention, attrition, compensation, etc.

Marketing Science – Predicts consumer behavior using analytics such as marketing mix modeling. Analysis can use transaction, store, or market-level data.

Operations Research – The application of advanced analytical methods for complicated supply chain network design, transportation routing and scheduling, and maximizing revenue based upon a finite capacity, usually in the transportation and hospitality industries.

Survey Statistics – Analyzes the results of structured surveys, conducted using a sample of a given population, in order to extrapolate the population's characteristics using descriptive and inferential statistical methodologies.

AI Professionals specializations may include Natural Language Processing (NLP), Computer Vision (CV), Internet of Things (IoT), Deep Learning, or other areas where unstructured or streaming data is prevalent.

Natural Language Processing (NLP) - giving computers the ability to understand text and spoken words similar to how humans do, through combining rule-based linguistic modeling and machine learning models. Use cases include: spam detection, machine translation, virtual agents and chatbots, social media sentiment analysis, and text summarization.

Computer Vision (CV) - A sub-field of AI that enables computers to derive information from images, videos, and other inputs. Use cases include: image classification, object detection, object tracking, and object recognition.

Internet of Things (IoT) - An IoT is a system of interrelated sensors, software and processing ability that exchange data over the Internet or other communications network. Applications can be consumer (smart home, elder care), organizational (medical, transportation), industrial (manufacturing, agriculture) or infrastructure (energy and environmental monitoring).

Although they may specialize in a specific area, AI Professionals are typically equipped to work on every stage of the analytics process which includes:

Analytics – This involves statistical and machine learning-based modeling in order to understand, describe, or predict patterns in the data.

Prescribing Actions – This involves interpreting analytical results through the lens of business priorities and using data-driven insights to inform strategy.

Programming/Automation – In many cases, data scientists are also responsible for creating libraries and utilities to operationalize or simplify various stages of this process. Often, they will contribute production-level code for a firm's data products.

Data professionals whose jobs involve data management but stop short of developing models, are classified as Data Engineers and their salaries are described in a separate report.
Their responsibilities could be described as:

Data Acquisition – This may involve scraping data, interfacing with APIs, querying relational and non-relational databases, building ETL pipelines, or defining strategy in relation to what data to pursue.

Data Cleaning/Transformation – This may involve parsing and aggregating messy, incomplete, and unstructured data sources to produce datasets that can be used in analytics and/or predictive modeling.

Professionals whose jobs are described as business intelligence, marketing research, and information technology are not considered AI Professionals, because they do not work with large datasets. Although AI Professionals are a subset of Data Scientists, they were analyzed separately from the Data Scientist sample because they have atypical computer science skills to manage unstructured data, resulting in slightly higher compensation bands.

Data Science & AI Professionals Segmentation

To examine how the compensation of Data Scientists and AI Professionals varies, Burtch Works used characteristics of their jobs (level, location of employer, industry) and demographic characteristics (gender, years of experience, residency status) to segment data scientists.

Burtch Works developed the following job categories:

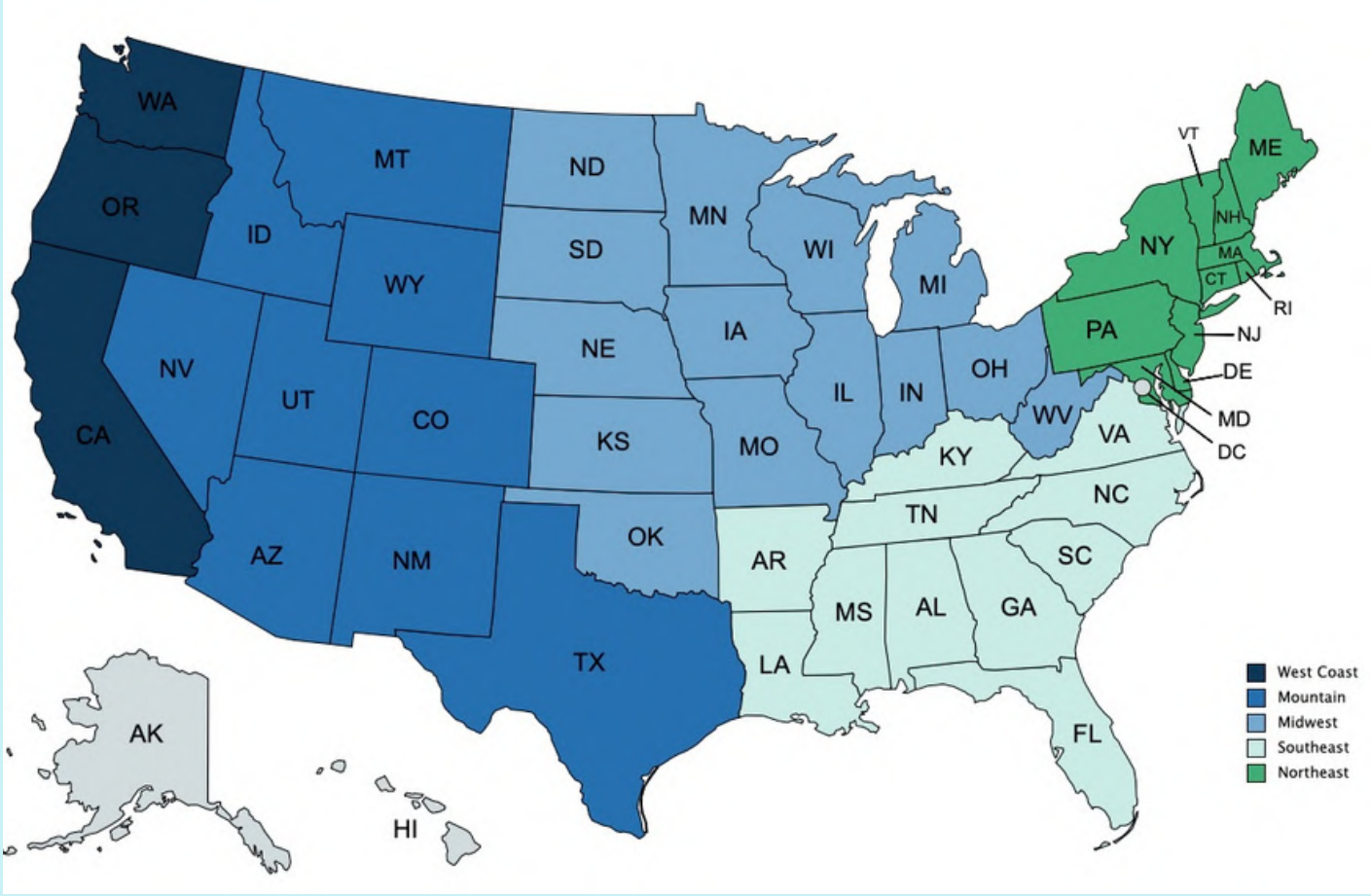
Individual Contributors

Level	Responsibility	Typical Years of Experience
Level 1	Learning the job, hands-on analytics & modeling	0-3 years
Level 2	Hands-on, more advanced problems, may help train analysts	4-8 years
Level 3	Analytics Subject Matter Expert, mentors and trains analysts	9+ years

Managers

Level	Responsibility	Typical No. of Reports
Level 1	Tactical, leads a small team w/in a function, project execution responsibility	1-3 reports (direct or matrixed)
Level 2	Leads a function, moderately sized team, executes strategy	4-15 reports (direct or matrixed)
Level 3	Senior/executive management, determine strategy, large team	15+ reports (direct or matrixed)

Burtch Works divides the U.S. into these five regions: Northeast, Southeast, Midwest, Mountain.



The firms for which Data Scientists and Analytics Professionals work were divided into these eight industry categories:

- **Academia/Government**
- **Advertising/Marketing Services**
- **Consulting**
- **Financial Services**
- **Healthcare/Pharmaceuticals**
- **Retail & Consumer Packaged Goods (CPG)**
- **Technology/Telecom/Gaming**
- **Other**

Each Data Scientist and Analytics Professional was assigned to one of these five residency status categories:

- **U.S. Citizen**
- **Permanent Resident**
- **H-1B**
- **F-1/OPT**
- **Other**

Finally, each Data Scientist and Analytics Professional was assigned to one of these education categories:

- **No degree**
- **Bachelor's degree**
- **Master's degree**
- **PhD**

Appendix B: *Glossary of Terms*

This section provides definitions of terms used in this report.

Analytics Professionals. Artificial Intelligence (AI) Professionals. A specialized predictive analytics professional who has both the programming proficiency required to make enormous sets of unstructured data accessible and also the analytical skills for deriving useful information from those data.

Base Salary. An individual's gross annual wages, excluding variable or one-time compensation such as relocation assistance, sign-on bonuses, bonuses, and long-term incentive plan compensation.

Data Scientist. Individuals who can apply sophisticated quantitative skills to data describing transactions, interactions, or other behaviors to derive insights and prescribe actions. They are distinguished from the "quants" of the past by the sheer quantity of data on which they operate, an abundance made possible by new opportunities for measuring behaviors and advances in technologies for the storage and retrieval of data.

F-1/OPT. A residency status that allows a foreign undergraduate or graduate student who has a non-immigrant F-1 student visa to work in the U.S. without obtaining an H-1B visa. The student is required to have either completed their degree or pursued it for at least nine months.

Geographic Region. One of five groups of states that together comprise the entire United States. These five groups of states – Northeast, Southeast, Midwest, Mountain, and West Coast – are shown in Figure 31 on page 52.

H-1B. A non-immigrant visa that allows a U.S. firm to temporarily employ a foreign worker in a specialty occupation for a period of three years, which is extendable to six and beyond. If a foreign worker with an H-1B visa quits or loses their job with the sponsoring firm, the worker must either find a new employer to sponsor an H-1B visa, be granted a new non-immigrant status, or leave the United States.

Individual Contributor. An employee who does not manage other employees. Individual contributors among the Data Scientists and PAPs in the Burtch Works sample have all been assigned to one of three levels:

Level 1: Responsible for learning the job; hands-on with analytics and modeling; 0-3 years' experience

Level 2: Hands-on with data, working with more advanced problems and models; may help train analysts; 4-8 years of experience

Level 3: Considered an analytics Subject Matter Expert; mentors and trains other analysts; 9+ years' experience

Industry. One of eight groups of firms employing most data professionals. These eight industry categories are Academia/Government, Advertising/Marketing Services, Consulting, Financial Services, Healthcare/Pharmaceuticals, Retail & Consumer Packaged Goods (CPG), Technology/Telecom/Gaming, and Other.

Academia/Government: Institutions whose purpose is the pursuit of education or academic research such as public universities, private colleges, and for-profit education companies; or organizations that are a part of the governmental system, such as the Department of Defense and national research laboratories

Advertising/Marketing Services: An industry consisting of firms that provide services to other firms that include advertising, market research, media planning and buying, and marketing analysis.

Consulting: Industry that includes both large corporations and small "boutique" firms that provide professional advice to the managers of other firms.

Financial Services: Firms that provide money management, lending, or risk management services, including banks, insurance companies, and credit card organizations.

Healthcare/Pharmaceuticals: Firms that provide healthcare services, such as hospitals, and firms that manufacture medicinal drugs.

Retail & Consumer Packaged Goods (CPG): Organizations that purchase goods from a manufacturer to be sold for profit to the end-consumer, and companies whose products are sold quickly and at relatively low cost, including non-durable goods (e.g. groceries, toiletries) and lower quality consumer electronics.

Technology/Telecom: Firms that create or distribute technology products or services, such as computer manufacturers and software publishers, and firms that provide telecommunications services.

Other: Companies whose industry falls outside of the categories described above, such as airline companies, distribution firms, restaurants, and hospitality.

Manager. An employee who manages the work of other employees. Managers among the Data Scientists and AI Professionals in the Burtch Works sample have all been assigned to one of three levels:

Level 1: Tactical manager who leads a small group within a function, responsible for executing limited-scale projects or tasks within a project; typically responsible for 1-3 direct reports or matrix individuals.

Level 2: Manager who leads a function and manages a moderately sized team; responsible for executing strategy; typically responsible for 4-9 direct reports or matrix individuals.

Level 3: Member of senior management who determines strategy and leads large teams; manages at the executive level; typically responsible for 10+ direct reports or matrix individuals.

Mean. Also known as the average, it is the sum of a set of values divided by the number of values. For example, the mean of N salaries is the sum of the salaries divided by N.

Median. The value obtained by ordering a set of numbers from smallest to largest and then taking the value in the middle, or, if there are an even number of values, by taking the mean of the two values in the middle. For example, the median of N salaries is the salary for which there are as many salaries that are smaller as there are salaries that are larger. The median is sometimes preferred because it is less influenced by outliers than the mean.

Interquartile Range (IQR). A measure of variability, that is based on rank-ordering and dividing a data set into four parts (quartiles). The IQR is the difference between the 3rd quartile (the middle value of the second half) and the 1st quartile (the middle value of the second half).

N. The number of observations in a sample, sub-sample, or table cell.

OPT. See F-1/OPT.

Permanent Resident. A residency status that allows a foreign national to permanently live and work in the United States. Those with this status have a United States Permanent Residence Card, which is known informally as a green card.

Programming. The process of developing and implementing various sets of instructions to enable a computer to do a certain task. For the purposes of this study, programming refers to the use of general-purpose programming/scripting languages such as Python, Java, C, C++, or others.

Salary Study. A study conducted to measure the salary distributions of those in specific occupations. Traditionally, these studies have been executed by obtaining salary data from the human resources departments of firms employing professionals in those occupations or through online surveys, rather than by interviewing those employees themselves.

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