

Wharton People Analytics & Teach for America

Case Study

Team: 3D Data Driven Decisions



AKRITI



ANUSHKA BHANSALI

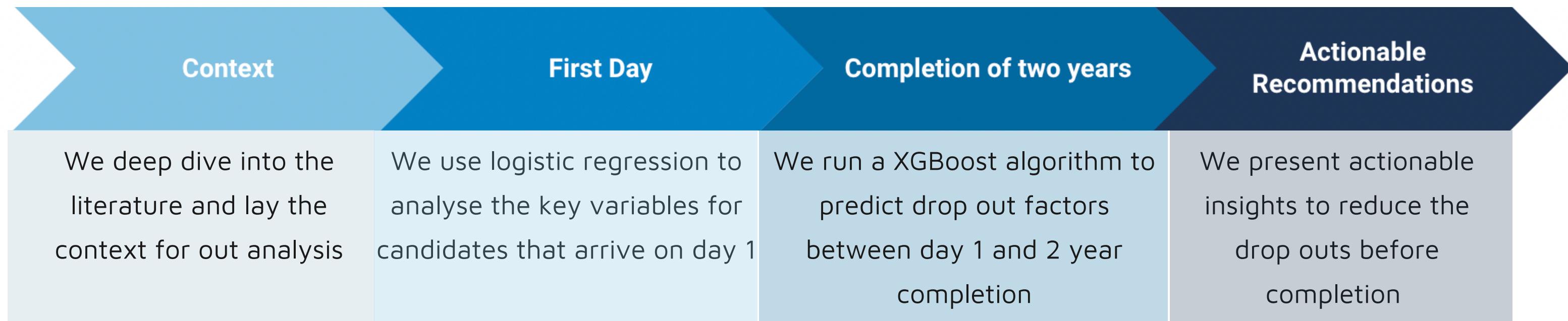


RIDHI JHAMB

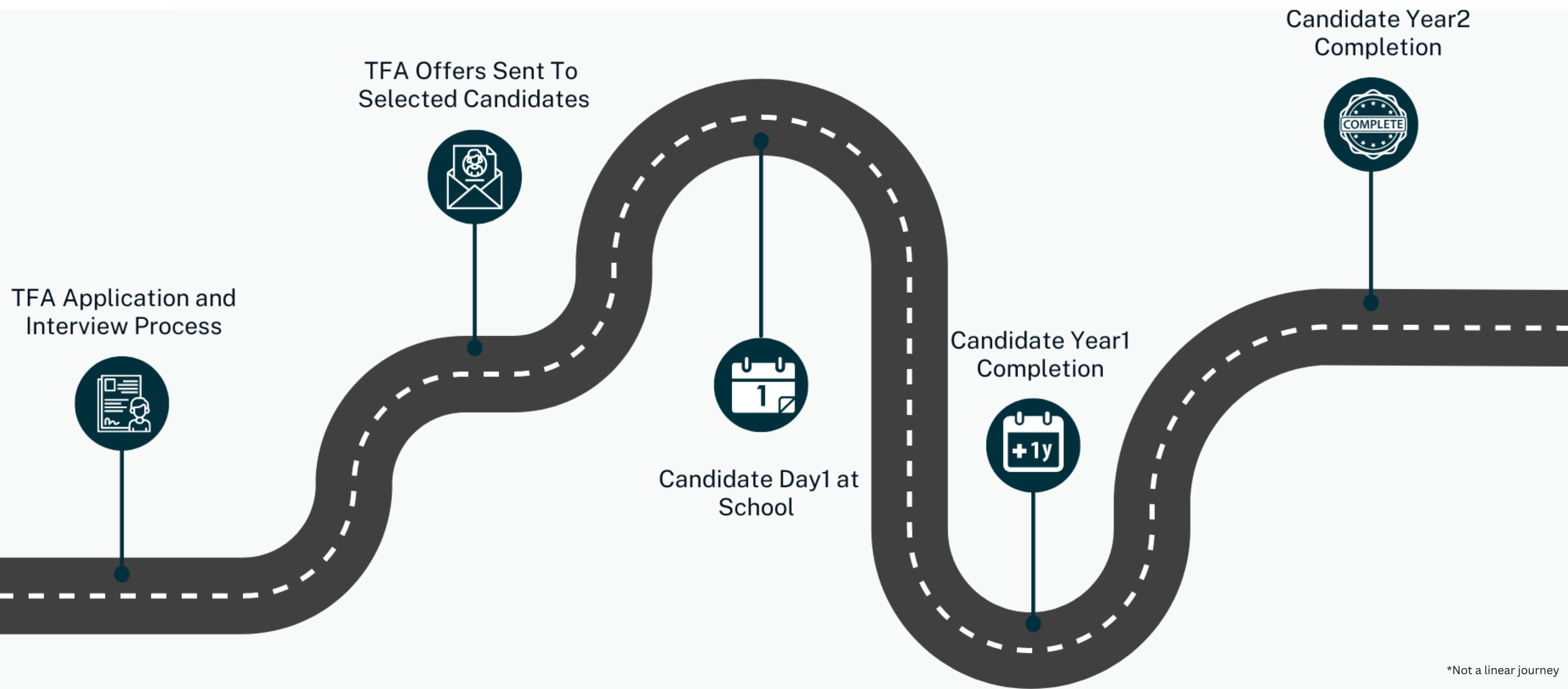


TRISHA NAGPAL

OVERVIEW

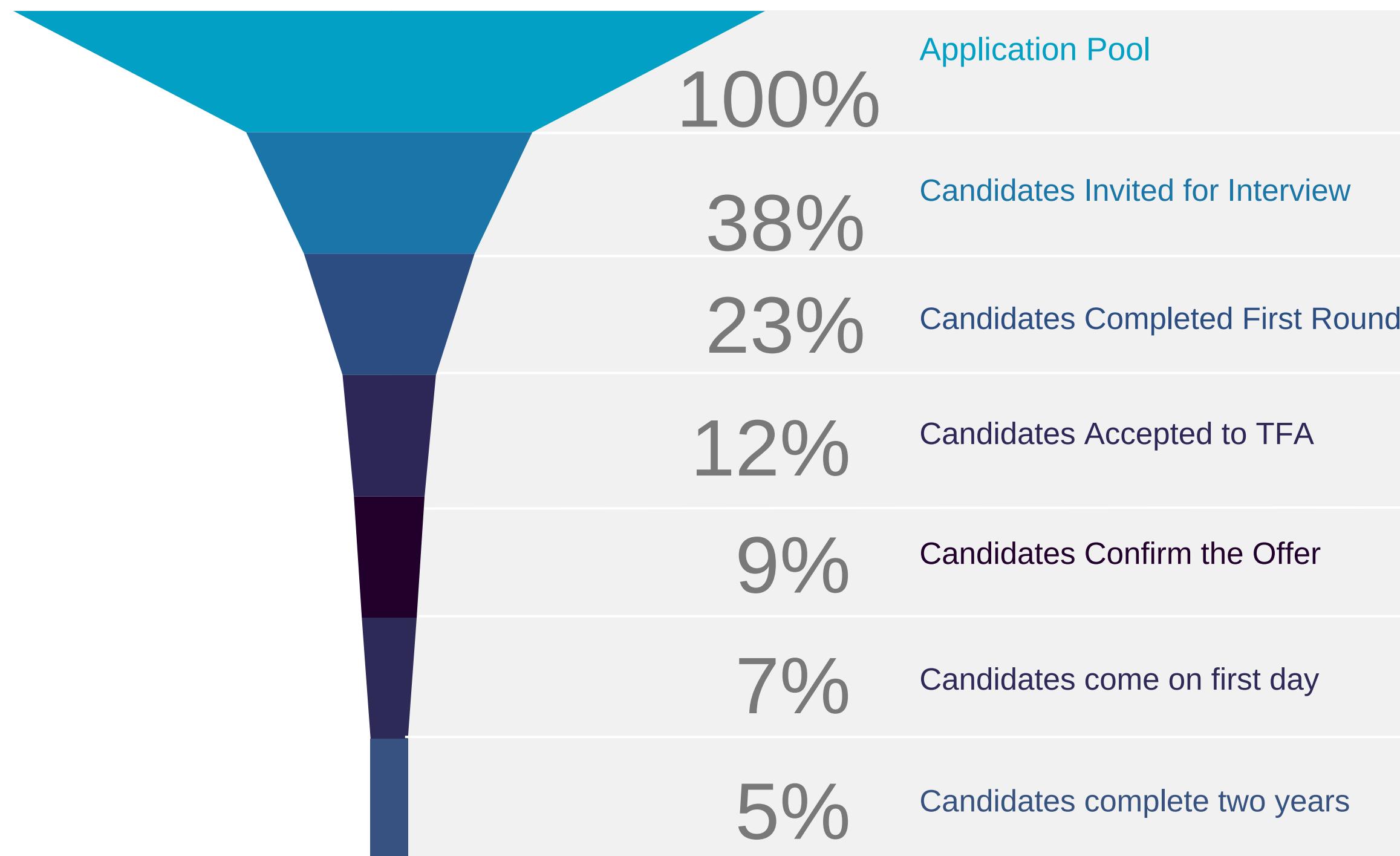


CANDIDATE JOURNEY MAP AT TEACH FOR AMERICA



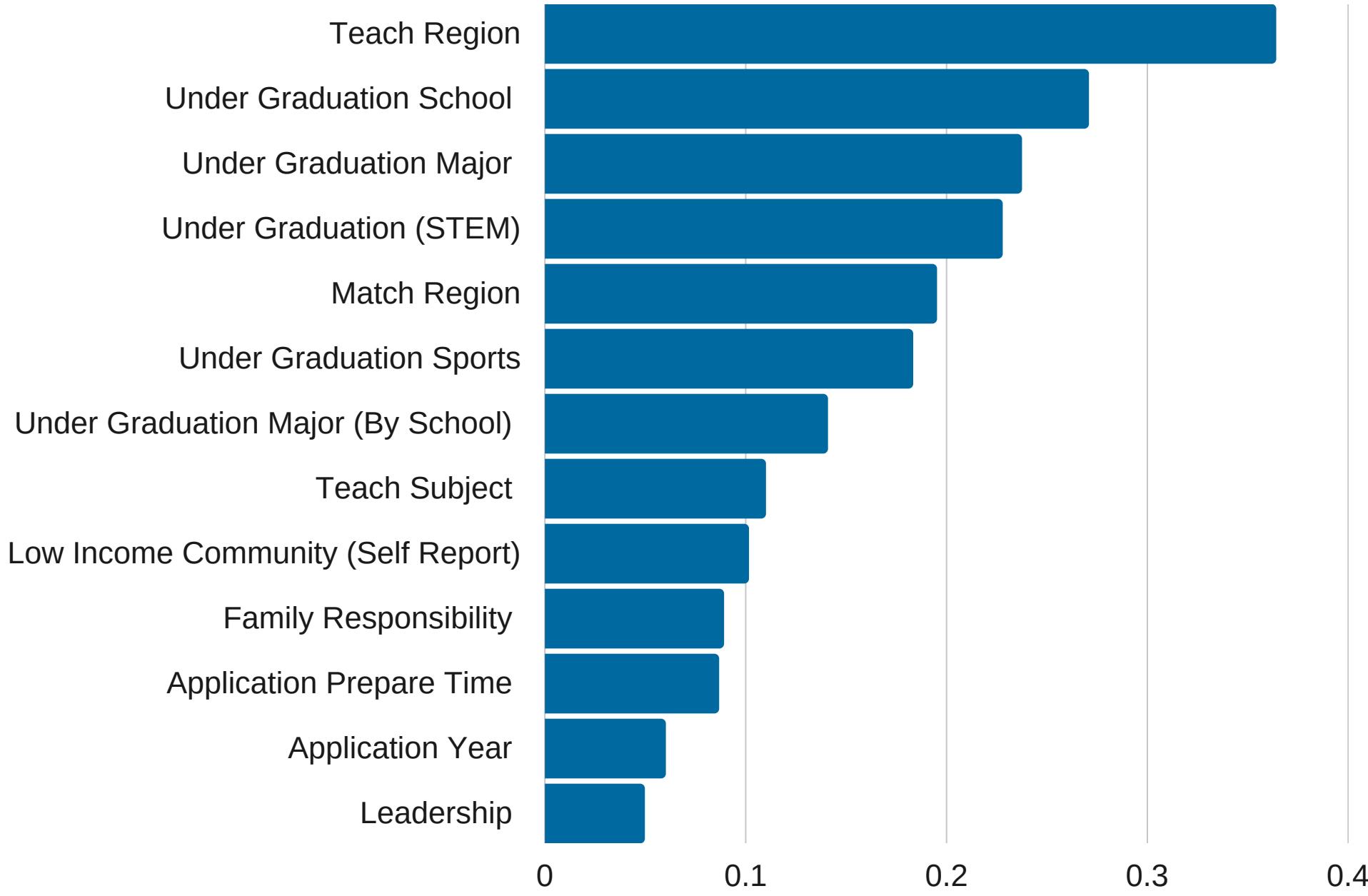
Selection Process at Teach For America

Only 5% of candidates complete two years at TFA from the application pool



FIRST DAY: VARIABLES

From our Logistic regression model, we found that Teach region, Under Graduation school, major and whether it is a STEM major or not matter the most for candidates to arrive on Day 1.



Teach Region

Certain regions like New York City, Bay Area, Boston, Memphis show an increasing gap between the number of candidates who arrive for day 1 Vs candidates who did not.



Under Graduation School

Candidates from certain Universities who arrive on Day 1 as against candidates that don't.



Under Graduation Major

Candidates with majors in Psychology and Political Science are more inclined towards arriving on Day 1.



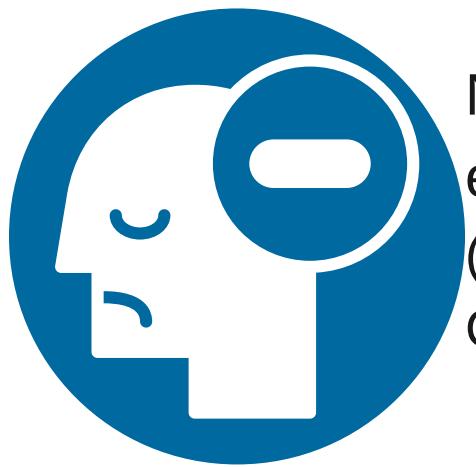
Under Graduation (STEM)

People from Non-STEM backgrounds tend to arrive on Day 1 as against the ones with STEM background.

Logistic regression - a statistical model that uses a logistic function to model a binary dependent variable based on one or more independent variables.
Our model has an accuracy of 81%.

COMPLETING TWO YEARS

These five attributes combined from the XGBoost analysis and the literature review, have been prominent in understanding the reasons for people completing two years at Teach for America or dropping out in the middle.



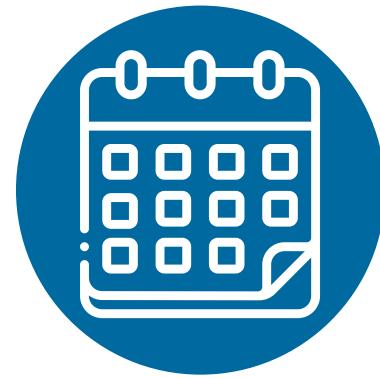
Non conducive work
environment
(ERIC, 2011(3); Dietz, 2011(4);
Cooper, 2013(5))



Low incentives for
work
(ERIC, 2011; Dietz,
2011)



Family
Responsibility*



Application Process
Time*

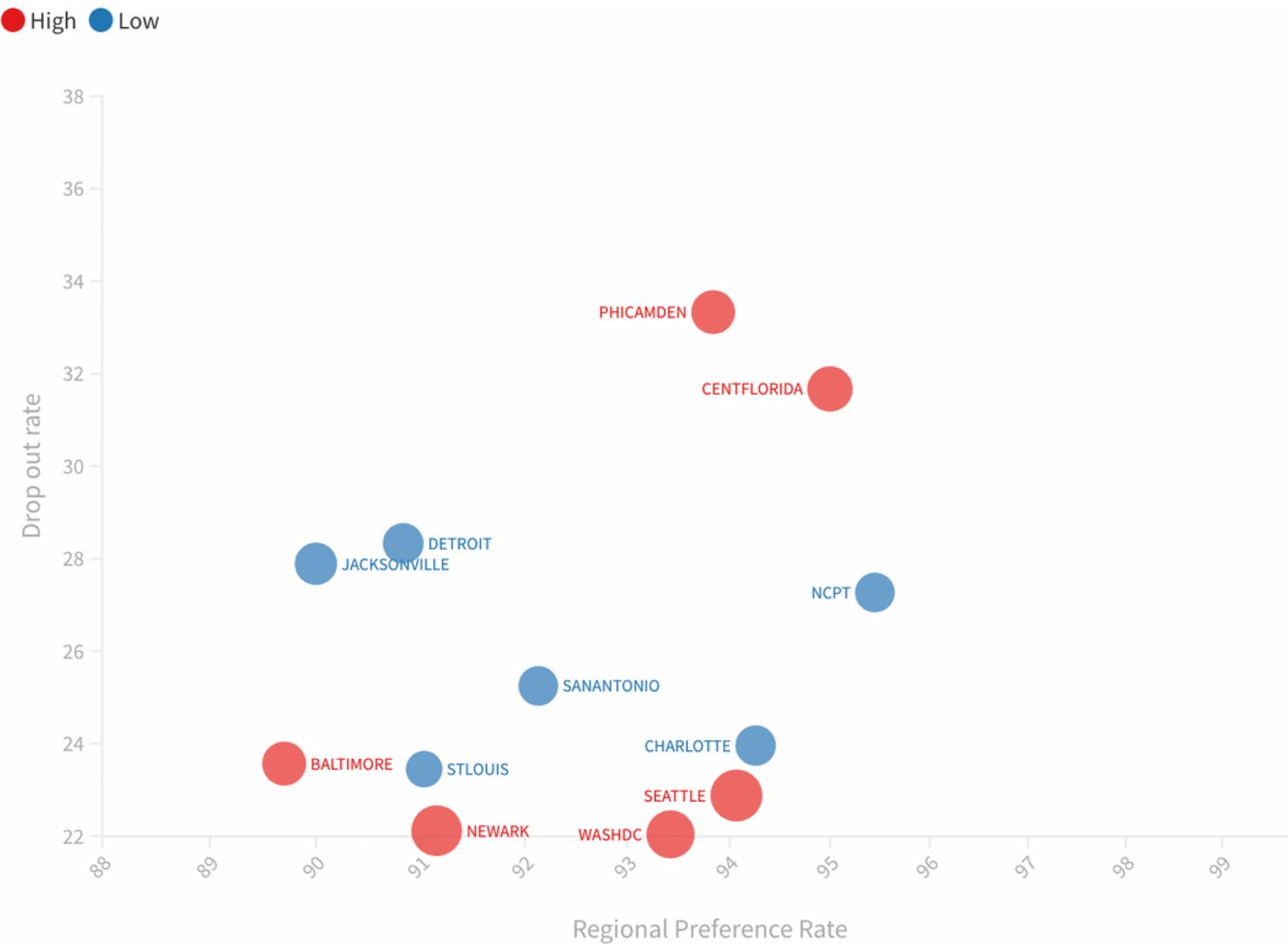


Cost of Living*

We combined our literature review with the most weighted variables from our model*
Our model is 75.8% accuracy with a precision of 0.81, recall of 0.75 and F1 score of 0.75.
To have a more detailed look, please see Appendix 2.

COMPLETING TWO YEARS

These 12 regions should be prioritised as they have a drop out rate and high preference rate.



Regional Preference Rate

This is the percentage of candidates that strongly preferred from all the people that had a preference for the region.

Drop Out Rate

The percentage of candidates that dropped out after the first day.

Average Cost

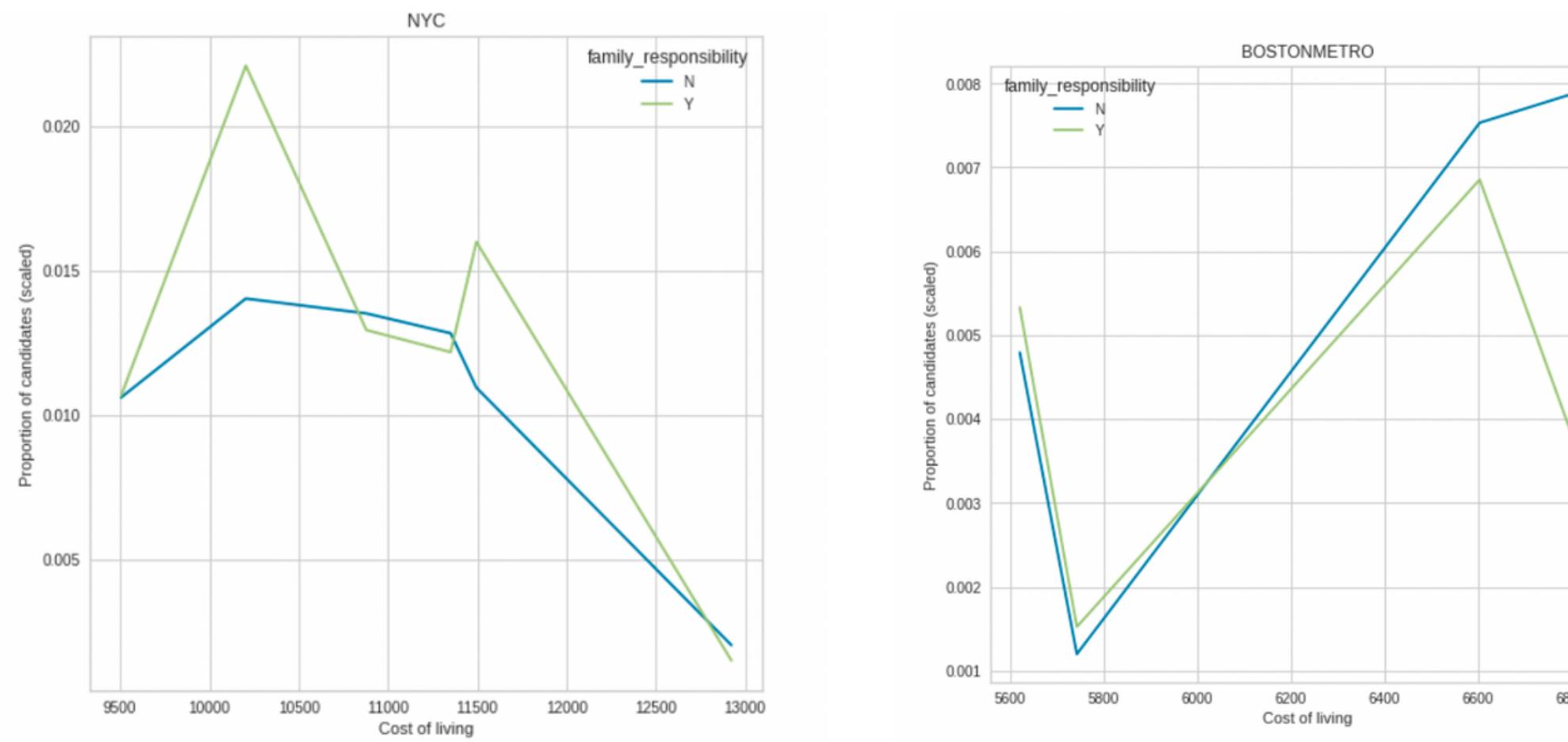
The average cost of living in these regions from 2016.

In this graph, we highlight the regions that have higher drop out rates and higher regional preferences than the mean. The other regions analysed in this form can be found in the Appendix.

Please note that the size of bubbles in the graph are based on the cost of living in these regions.

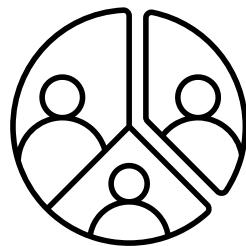
REGIONAL COSTS

Based on the model results, we can say that depending on the year, region and cost of living people with different family responsibilities drop off. We analyzed the top 5 TFA regions (regions with most number of applications) and found out varied trends.



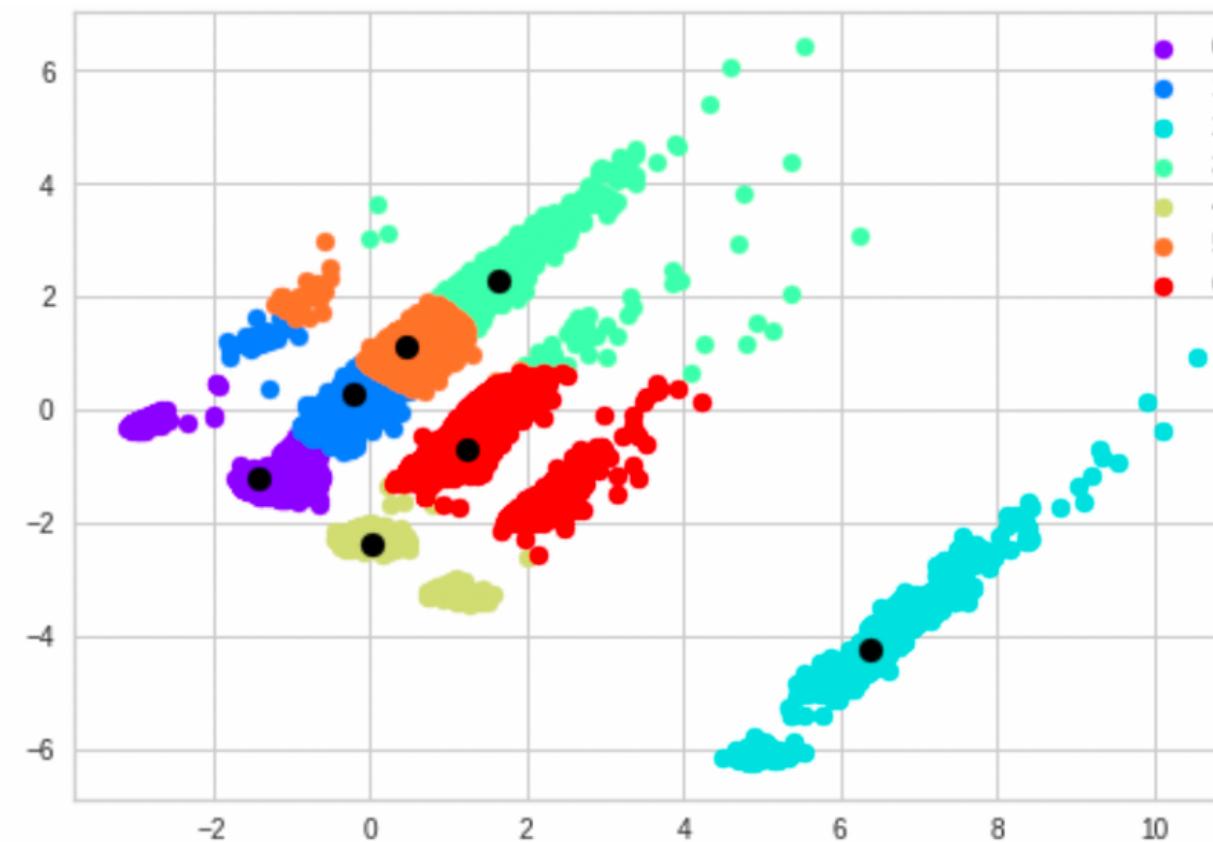
In NYC, people with family responsibility, drop off more than the people without it. However the drop offs decrease with the cost of living, through the years.

In Boston, drop offs have increased with increasing cost of living over the years, with more drop offs of people with no family responsibility.



DATA DRIVEN RECOMMENDATIONS: CLUSTERING

Based on the data provided, we conducted k-means clustering to identify various segments. In addition, we suggest three more data points that will help us understand the candidates better. (Please see appendix for more details)



Additional Data points



Commitment variable



Performance variable



Opportunity cost variable

WHO TO INTERVIEW?

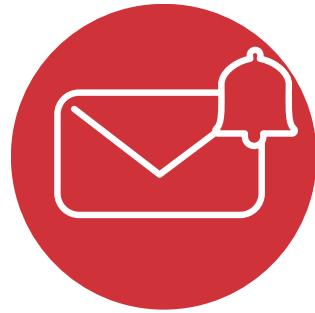
- Interview candidates who are similar to corp members who completed 2 year commitment in previous years.
- We recommend a candidate similarity algorithm, inspired by collaborative filtering which is a Machine Learning algorithm that predicts a person's interests by modeling preferences and behavior information of others like them.
- This can help TFA find candidates who are most likely to complete two years with them.
- Our algorithm outputs a list of candidates, most similar to the successful candidates of previous years. TFA can select top n from the above list where n is based on previous drop off between number of candidates interviewed and number of candidates who completed 2 years.
- Based on the data : No. of people to be interviewed= $7.14 * \text{sourcing_target}$
- Hence TFA can select top $7.14 * \text{sourcing_target}$ candidates from the model output, and optimize their recruitment process to get the best candidates.



BEHAVIORAL RECOMMENDATIONS: HABIT BUILDING



Make it easy for candidates by breaking down the complex goal of completing 2 years into simpler, easier actions (milestones- 3/6 month completions)



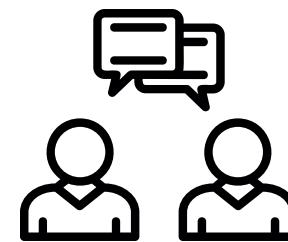
Prompt people when they are more receptive as they are more likely to change behavior during this period - during the waiting period between application and interview rounds, send out reminders and follow-up to candidates as they wait to hear back from TFA and other organizations as it will help in anchoring them



Help people plan their response to most commonly arising problems or issues based on feedback from previous candidates and the strengths and weaknesses of the current candidate



Encourage public commitments using social norms such as in group settings or on social media, where others can see and support their commitments. This can create a sense of accountability and motivate candidates to stick to their commitments



BEHAVIORAL RECOMMENDATIONS: ENGAGEMENT



Community Building - connect candidates with similar interests and hobbies with each other and candidates from previous years



Harnessing power of networks and collective action by leveraging expertise and knowledge of the candidates in specific areas and working together with the internal TFA team and the external school team where the candidates are posted



Mutual support spread peer-to-peer behavior through seminars and trainings, mentoring sessions and job rotations (as applicable) which also increases social connections which is a strong motivator



Encouraging people to make commitments together and to each other within the team/community such as how people will celebrate their milestone achievements or two-year completions with specific dates, days and plans; group countdowns as the team approaches any major milestone or meets important deadlines such as exam and project evaluations as this will create accountability among team members



Alumni Connect - Have pictures and videos of candidates or alums teaching students and working with them with quotes or testimonial videos about how and why they loved the experience; this will not only act as social proof by increasing behavioral observability but will also facilitate social learning



BEHAVIORAL RECOMMENDATIONS: INCENTIVES STRUCTURE



Try non-monetary incentives such as change in titles and/or smaller promotions, badges for social media and otherwise, recognition and praise, autonomy to make certain minor work decisions to give a sense of control and ownership



Periodic reminders of the overarching purpose or goal of making a meaningful contribution to the society by leveraging positive emotions and personalized messaging

SUMMARY

Context

- Only 5% of candidates complete two years at TFA from the application pool

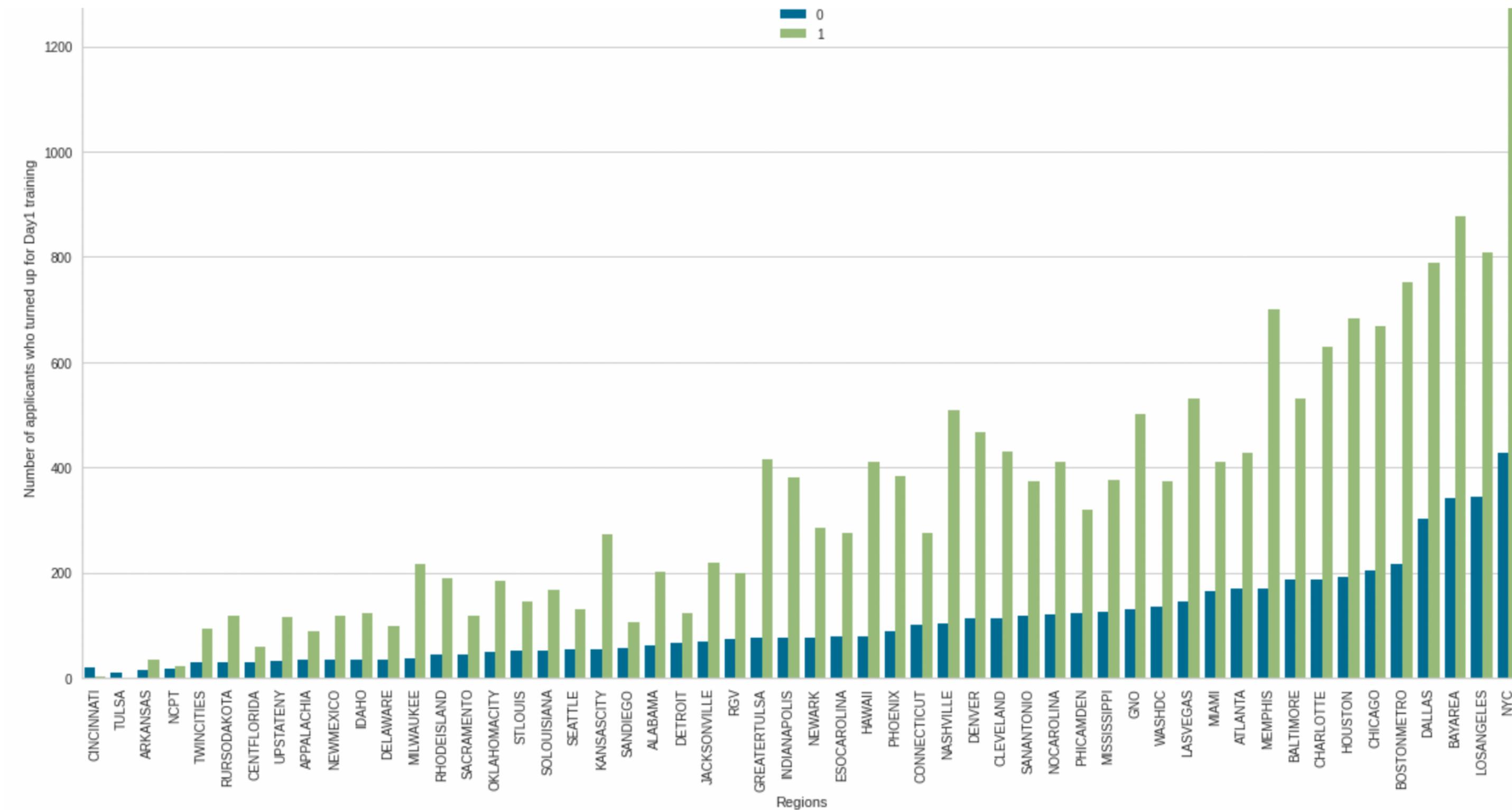
Analysis

- From our Logistic regression model, we found that Teach region, Under Graduation school, major and whether it is a STEM major or not matter the most for candidates to arrive on Day 1.
- There are five attributes combined from the XGBoost analysis and the literature review, have been prominent in understanding the reasons for people completing two years at Teach for America or dropping out in the middle.
- Regions with high Dropout rates and high regional preferences need to be prioritised.
- Based on the model results, we can say that depending on the year, region and cost of living people with different family responsibilities drop off. We analyzed the top 5 TFA regions (regions with most number of applications) and found out varied trends.

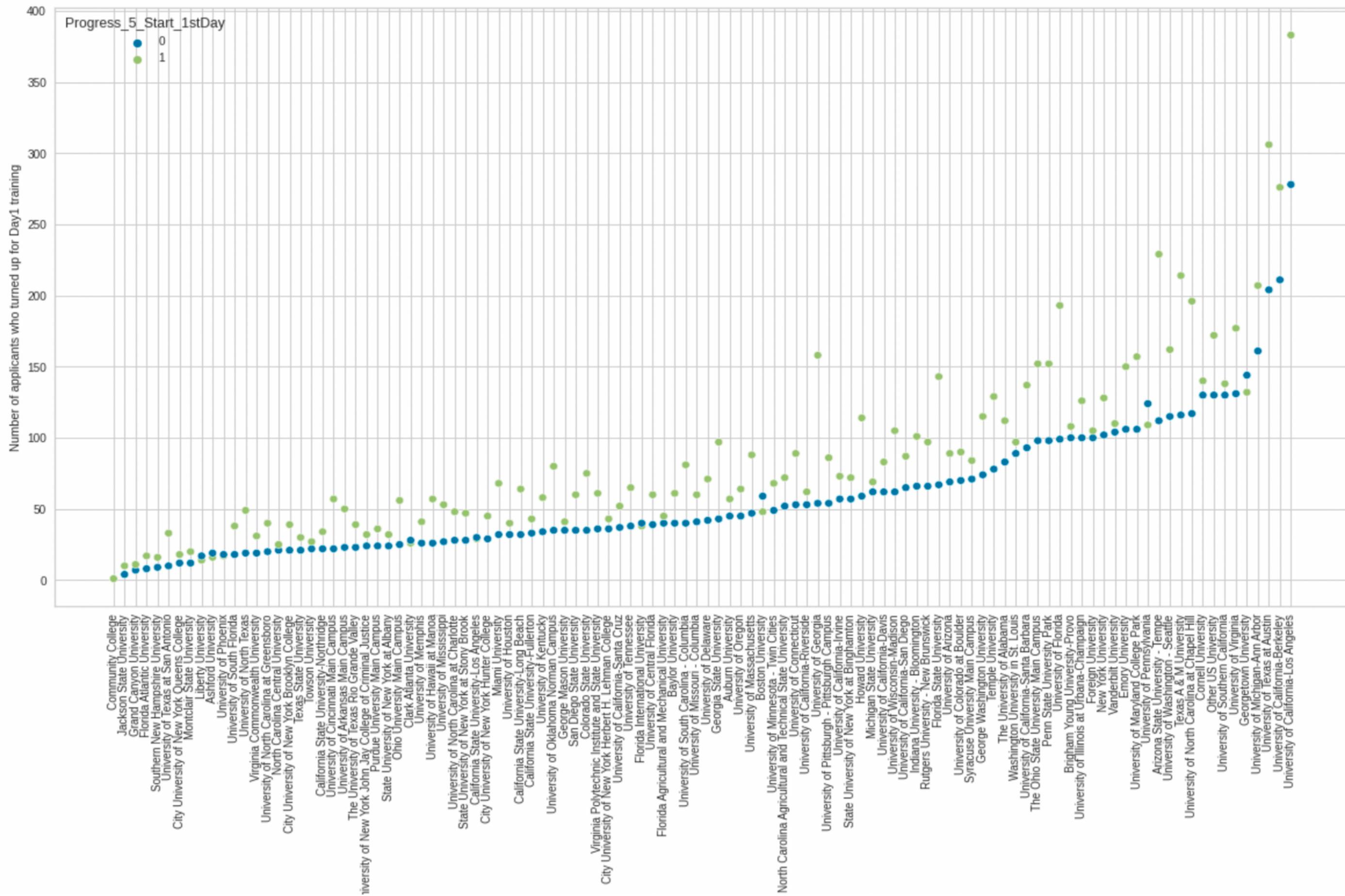
Recommendations

- We conducted k-means clustering to identify various segments. In addition, we suggest three more data points that will help us understand the candidates better.
- We recommend a candidate similarity algorithm, inspired by collaborative filtering which is a Machine Learning algorithm that predicts a person's interests by modeling preferences and behavior information of others like them to help TFA interview candidates who are most likely to complete two years with them.
- We can also nudge candidates to build habits, increase engagement.
- We can also change the incentives structure for the candidates to reduce the drop out rate.

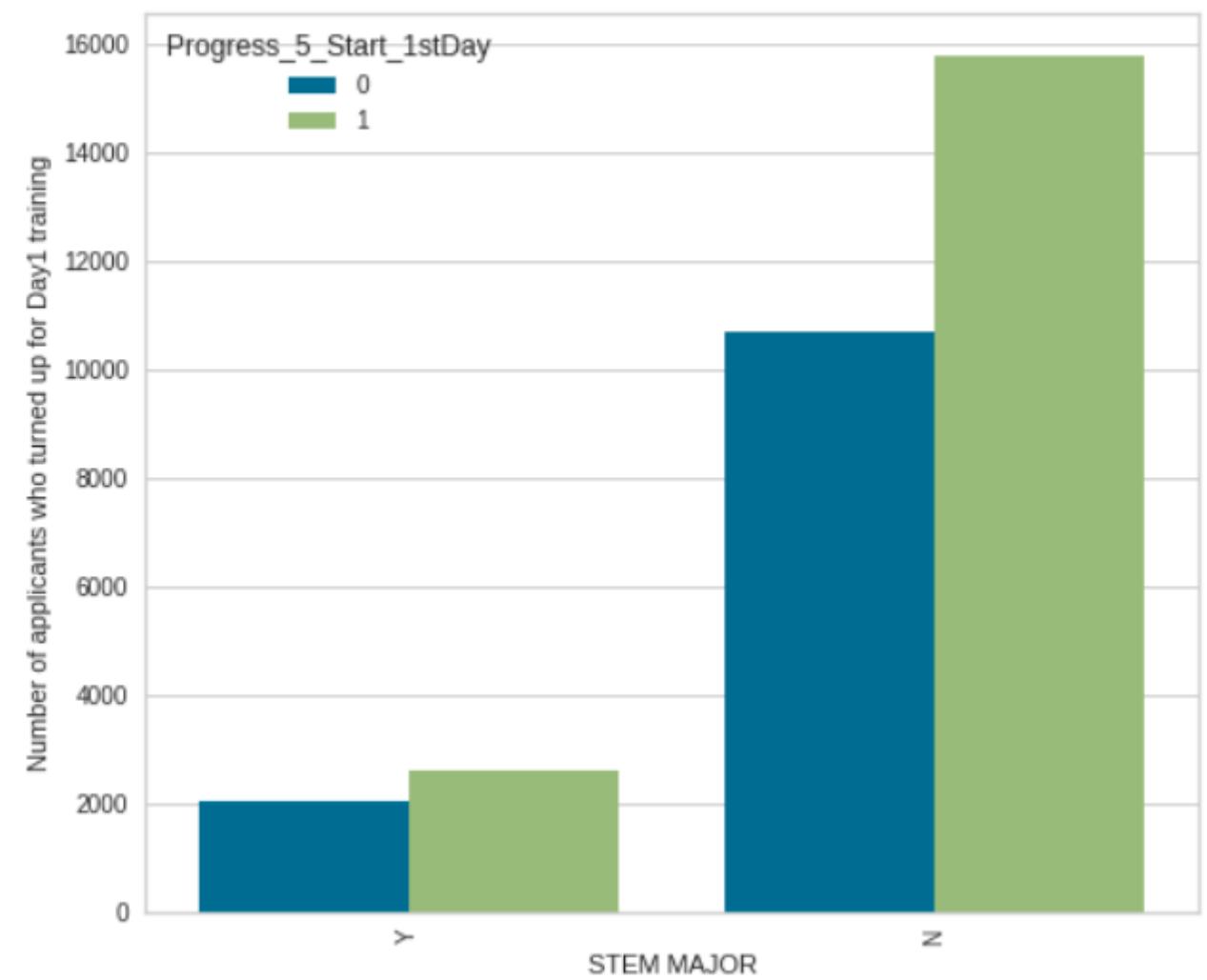
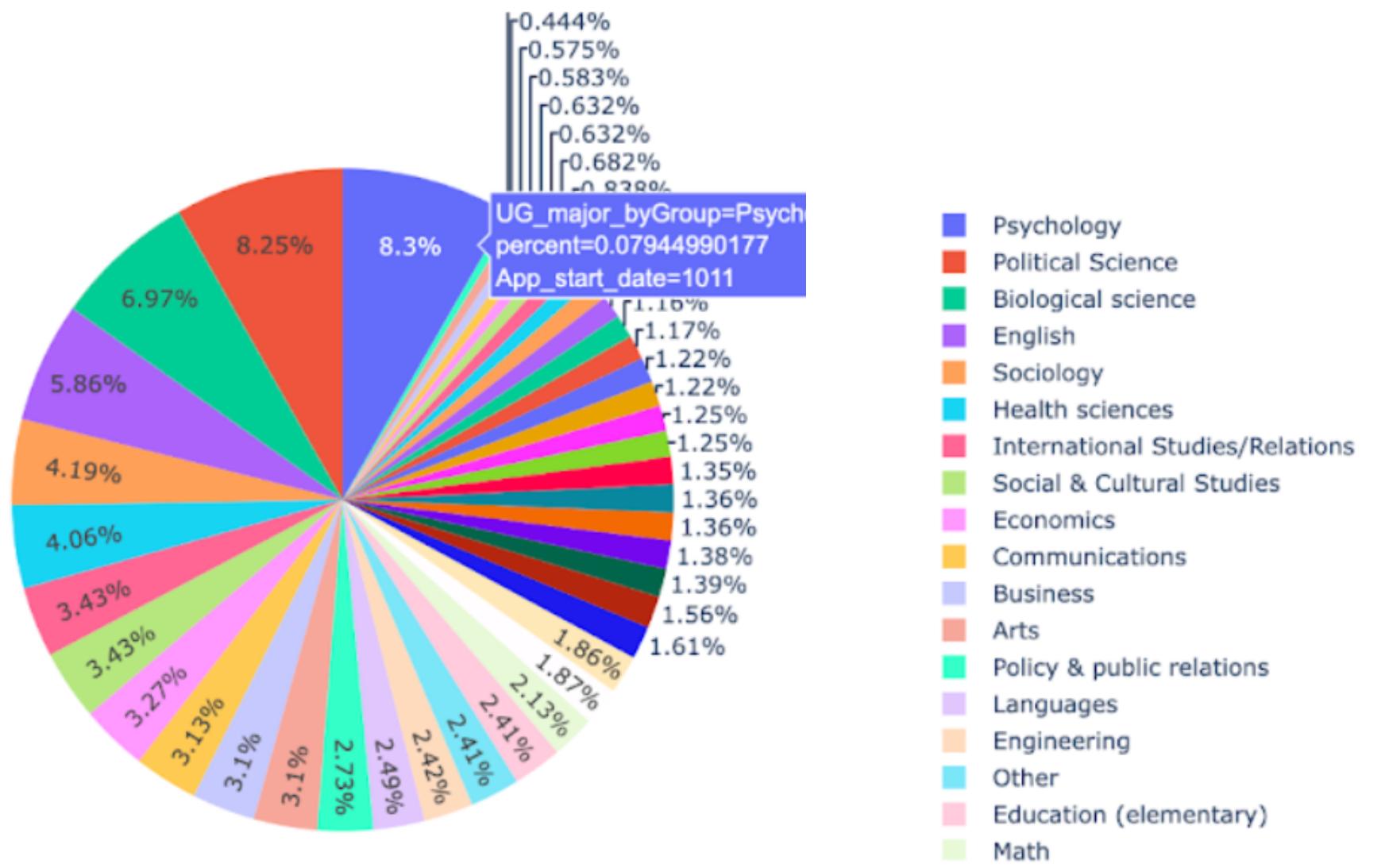
APPENDIX

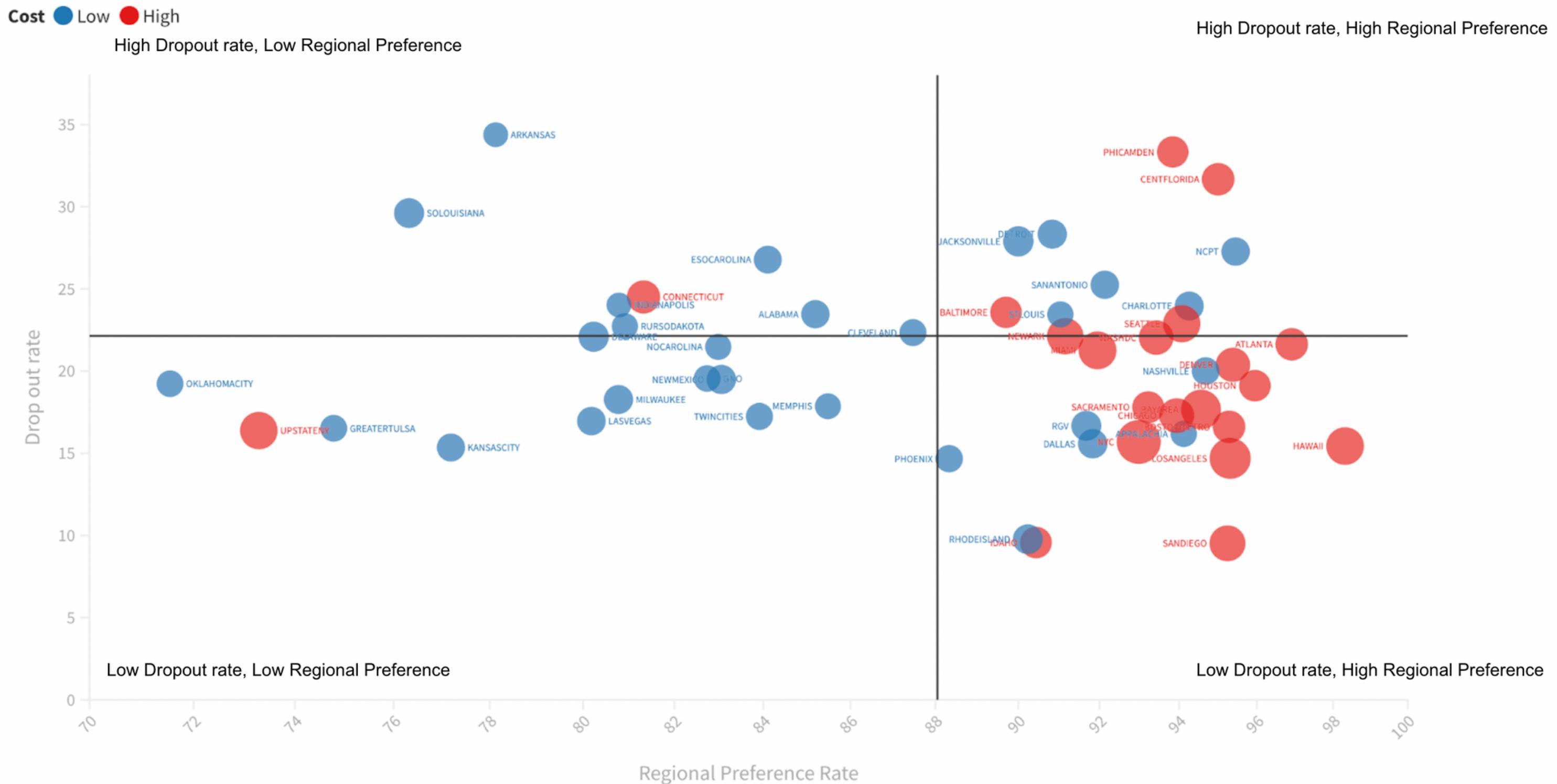


Number of applicants that showed up for Day 1 of training by region



Number of applicants that showed up for Day 1 of training by university indicating progress from the start day





Drop out rate by regional preference

- Clark, M. A., Isenberg, E., Liu, A. Y., Makowsky, L., & Zukiewicz, M. (2017). Impacts of the Teach for America Investing in Innovation Scale-Up. Revised Final Report. Mathematica Policy Research.
- Rubinstein, G. (2011, October 31). Why I did TFA, and why you shouldn't. Gary Rubinstein's Blog.
<https://garyrubinstein.wordpress.com/2011/10/31/why-i-did-tfa-and-why-you-shouldnt/>
- ERIC (Education Resources Information Center). (2011). When TFA alumni leave, they take a lot with them. ERIC Digest.
<https://eric.ed.gov/?id=EJ943646>
- Dietz, R. (2011, October 18). TFA Teachers: How Long Do They Teach? Why Do They Leave? Education Week.
<https://www.edweek.org/teaching-learning/opinion-tfa-teachers-how-long-do-they-teach-why-do-they-leave/2011/10>
- Schwartz, K. (2013, September 4). I Quit Teach for America. The Atlantic. <https://www.theatlantic.com/education/archive/2013/09/i-quit-teach-for-america/279724/>

