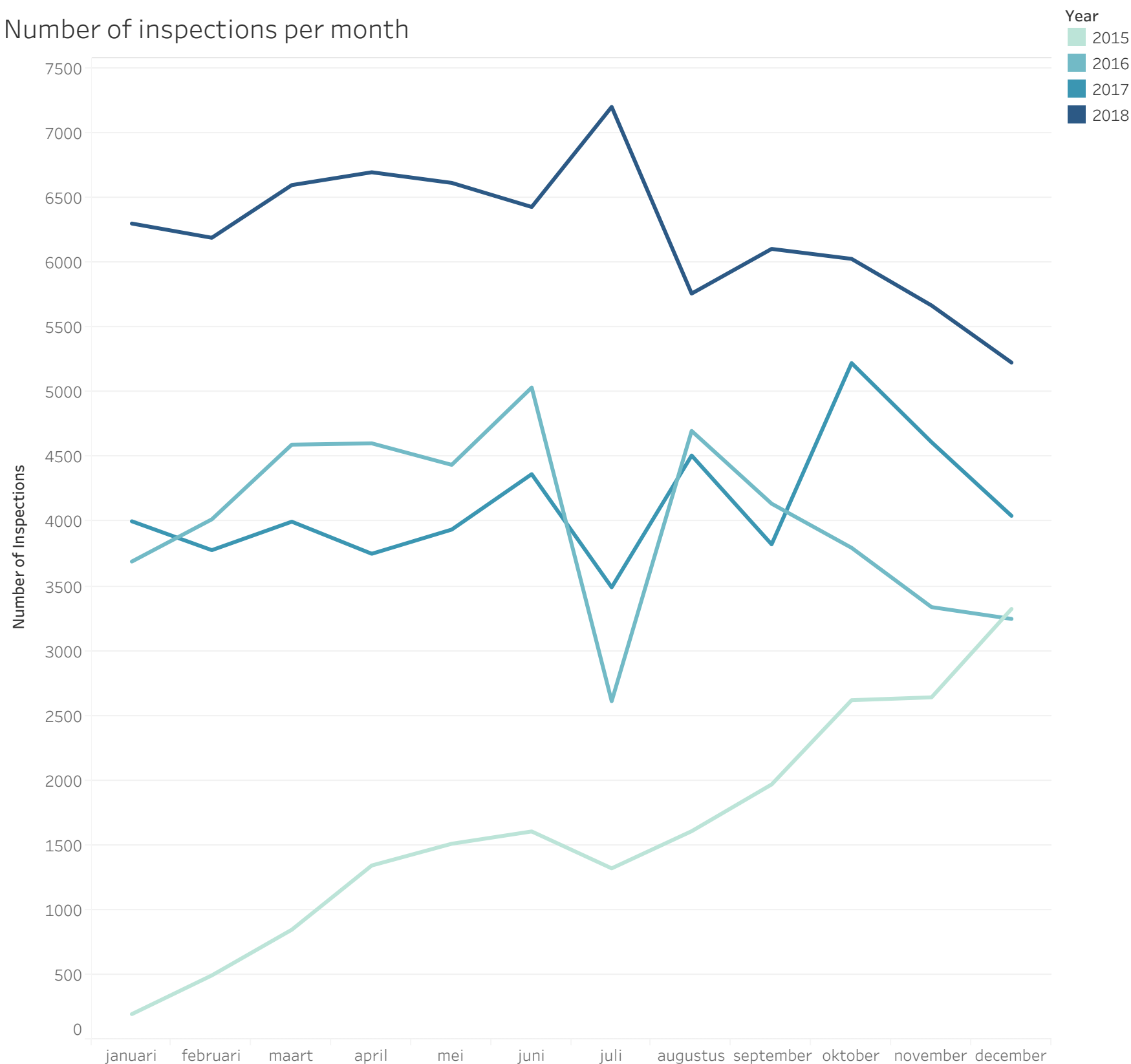**Question 1:** How does the number of inspections change over time (use month as the level of temporal granularity)? Does the number of inspections increase or decreate over time? Are there any peak times? Is there any seasonal effect (like inspections being more common during cretain seasons or months)?

Number of inspections per month


Year
- 2015
- 2016
- 2017
- 2018

The diagram shows the number of records as a function of the month of inspection in a stacked line graph per year of inspection and also color encoded by the year of inspection. Dates before 2015 are filtered from the data, because they contain very little records (which would result in a flat line in the graph) and also the null value 1/1/1900.

By showing the different years above each other in the same diagram it is easy to compare them and show seasonal effects (much easier than in a regular line chart that I first tried). This for instance shows that there was a dip in inspections in july of 2016 and 2017 that turned to a peak in 2018. The dip is also visible in 2015, though of course this year shows much less inspections, owing to the fact that only the three years prior to the last inspection of each restaurant are included in the data set. That last observation could have been reason to exclude the year 2015 in the same way that the inspections in earlier years up to 2014 were excluded, but it still contains some information so I left it in.

To easily distinguish between different years I changed the default color encoding of the year-category to one that ranges from a light to a dark color. In this way the darkness of the line gives a clear indication what the order of years is. So it is still easily seen that the recorded inspections grow over the different years, though this reveals little about the real number of inspections, since inspected restaurants that have gone out of business in the years shown are not included in the dataset.

Question 2: Is there any difference in how the number of inspections changes over time in the 5 different boroughs of New York City?

Number of inspections over time for restaurants in the boroughs of New York
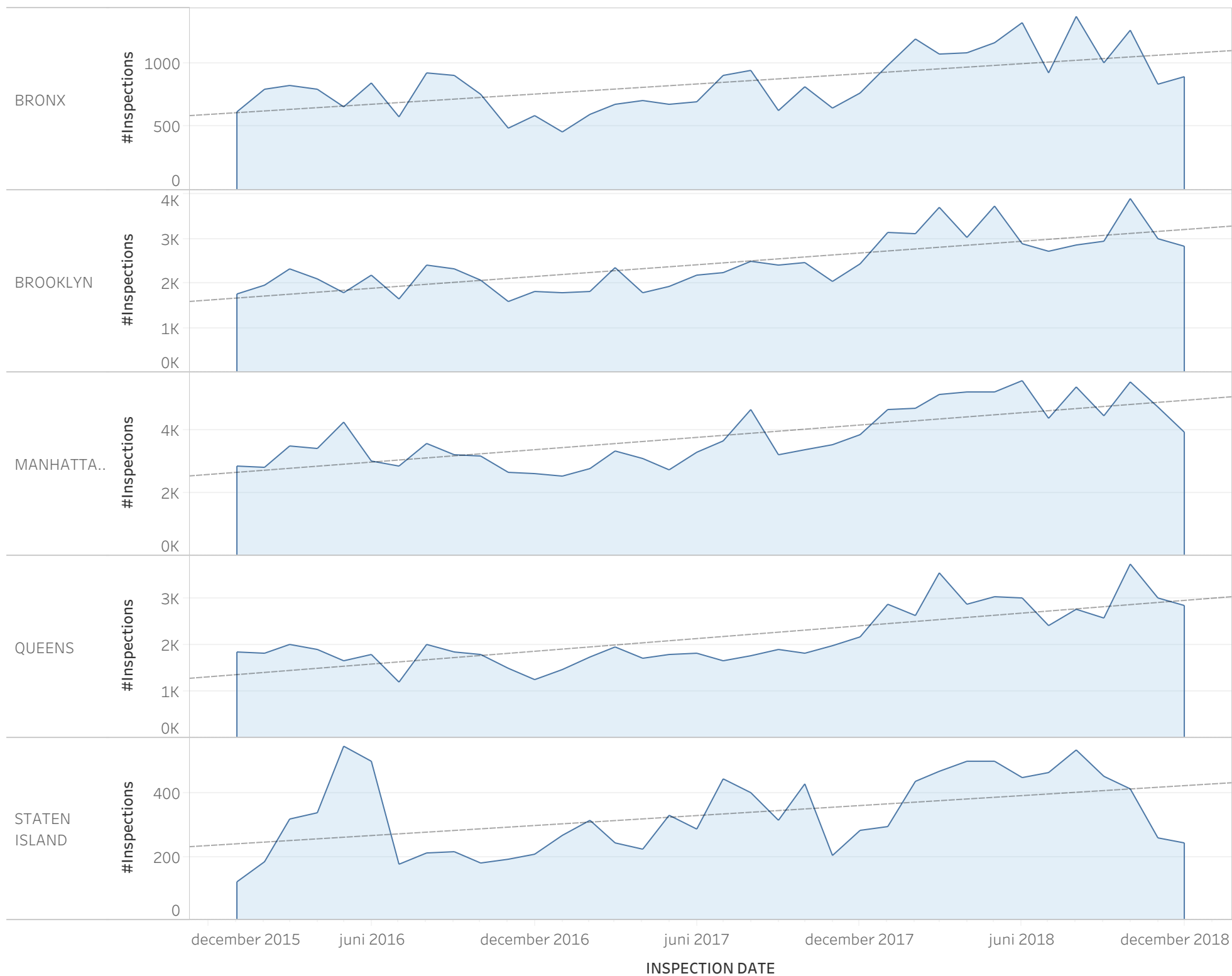
The area graph shows the number of records for each borrow as a function of the date, from 2016 to 2018, binned by month. I also tried binning per week, which also shows some interesting week to week fluctuations (see below), but by showing months the trends are more clear.

By normalizing the y-axis of the area graph, so that zero is at the bottom and the maximum at the top of the graph, the focus is placed on the relative differences between different month instead of the absolute values, so comparing the different boroughs is made easier. That is also helped by using an area graph instead of a line graph, where the lines would be 'floating' and the difference with the zero point would be less visible (also shown below).

Trend lines are added, that show the same increase in recorded inspections over the years for the different boroughs, but, as earlier described, it is not clear what part of this can be ascribed to businesses having gone out of business.

What ís clear, is that inspections in Staten Island show more variation, with a high peak in the early summer of 2016. For the top first four boroughs shown the peaks and dips follow mostly the same pattern.
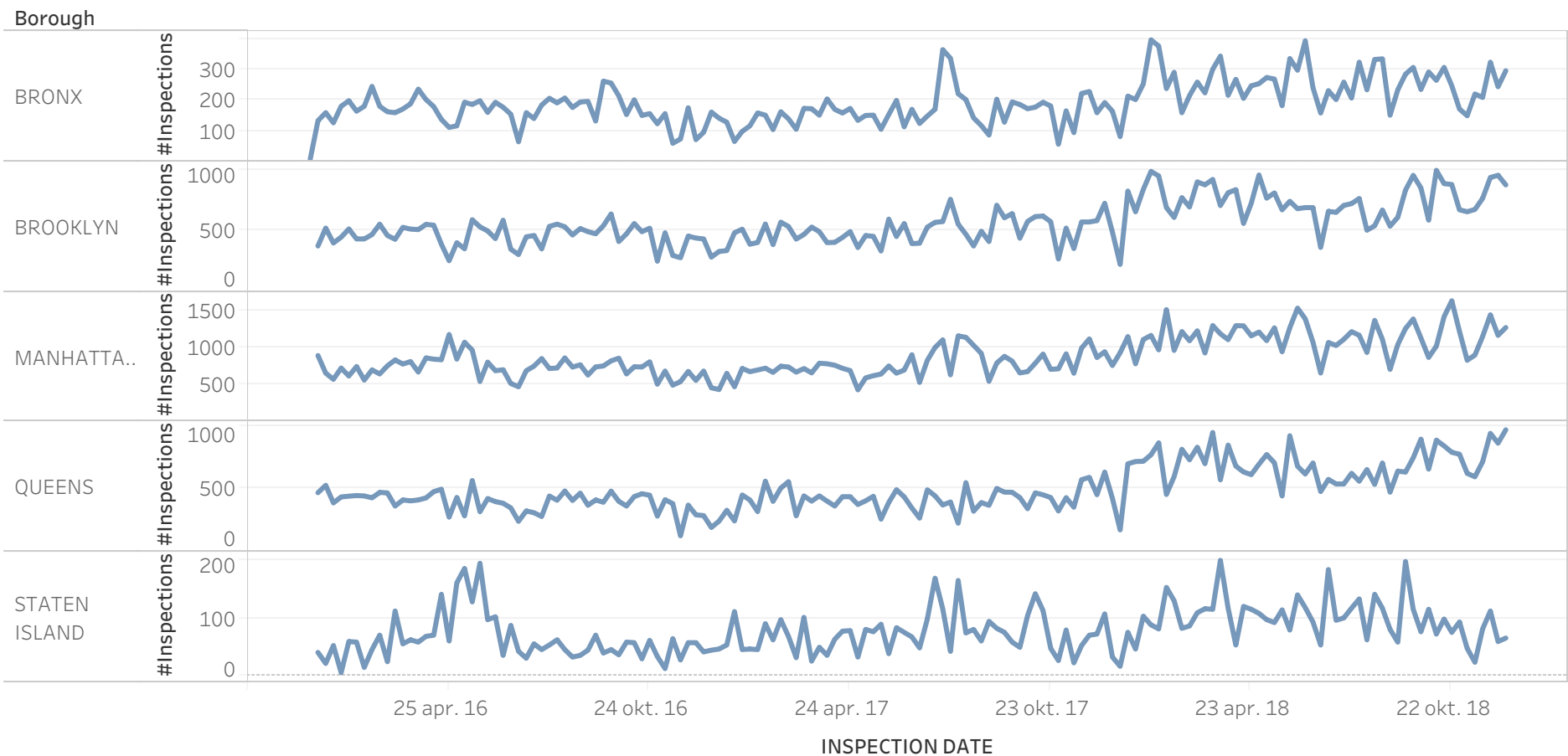
Question 3: How are cuisines types distributed across the New York area? Are there geographical areas where certain cuisines tend to concentrate (that is are there any areas where certain cuisines are more prevalent than others)? NOTE: focus only on the top 5 most frequent "Cuisine Description" categories.

Number of restaurants per zip code

American

Café/Coffee/Tea

Chinese

Italian

Pizza
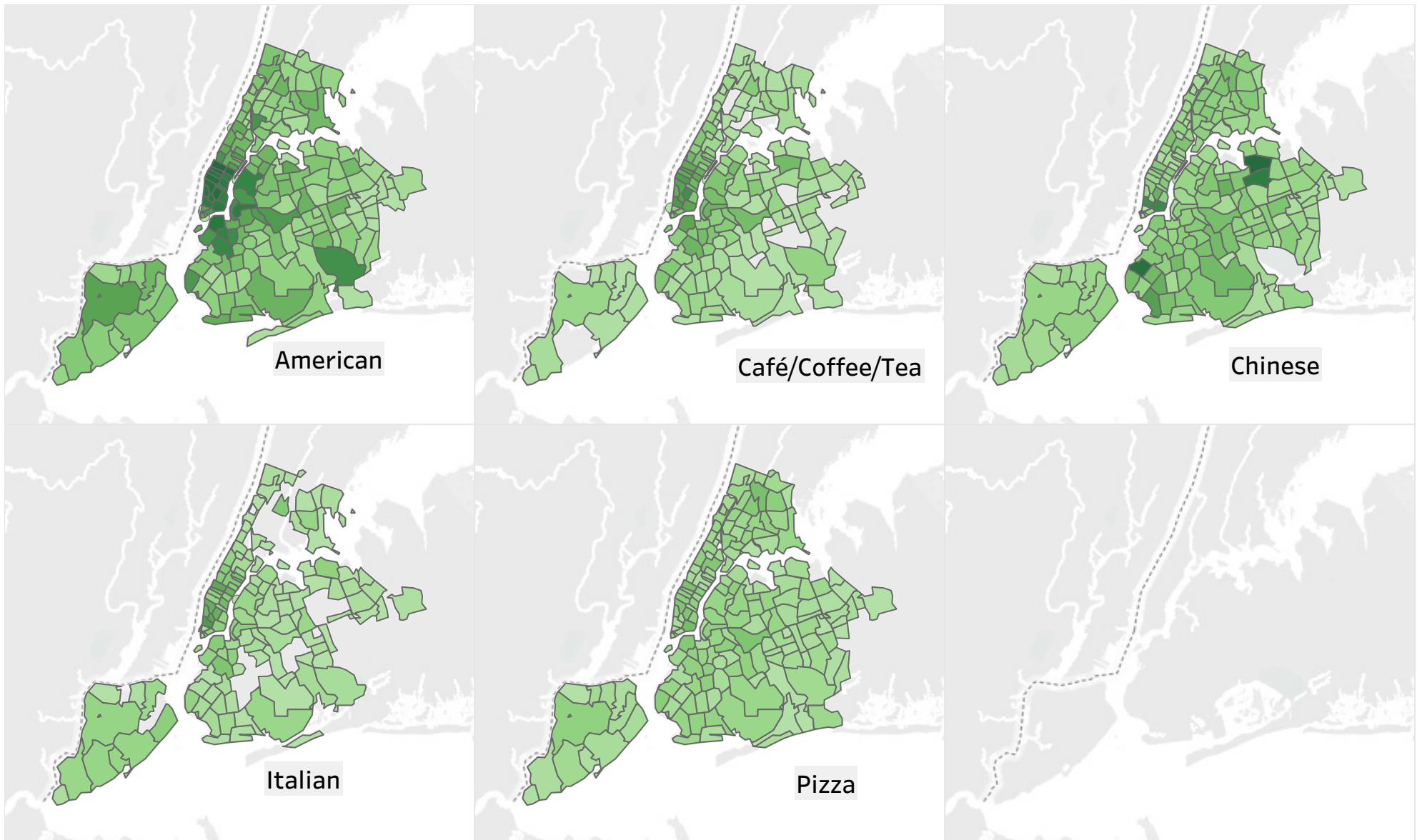
I tried showing all information on one map, but that made the diagram not very clear: Since I used the number of restaurants as size parameter it caused cuisines to disappear if other cuisines with more restaurants at the same zip-code were ordered before them (especially in Manhattan only American restaurants remained).
So I used small multiples to show one map for each cuisine. I also started using not dots but the actual zip-code regions, so I could nog longer use size for the number of restaurants. By choosing an appropriate color palette (light to dark) I now use color for number of restaurants.
 The size is not a percentage of the restaurants of the same cuisine, but the number of unique restaurants at the same zip-code. This makes it possible to compare to restaurants of the same type but also to restaurants of different types.We can see for instance that the number of cafés is smaller than the other restaurant types.

Clearly visible is the concentration of Chinese restaurants in (guess) China Town, but also in two other locations. Latin restaurants have some pronounced concentrations too. Pizza restaurants are more evenly divided over the city.

I have also tried coloring the cuisines differently, which looks nice, but does not really add anything informative.

Percentual distribution of restaurants per zip code
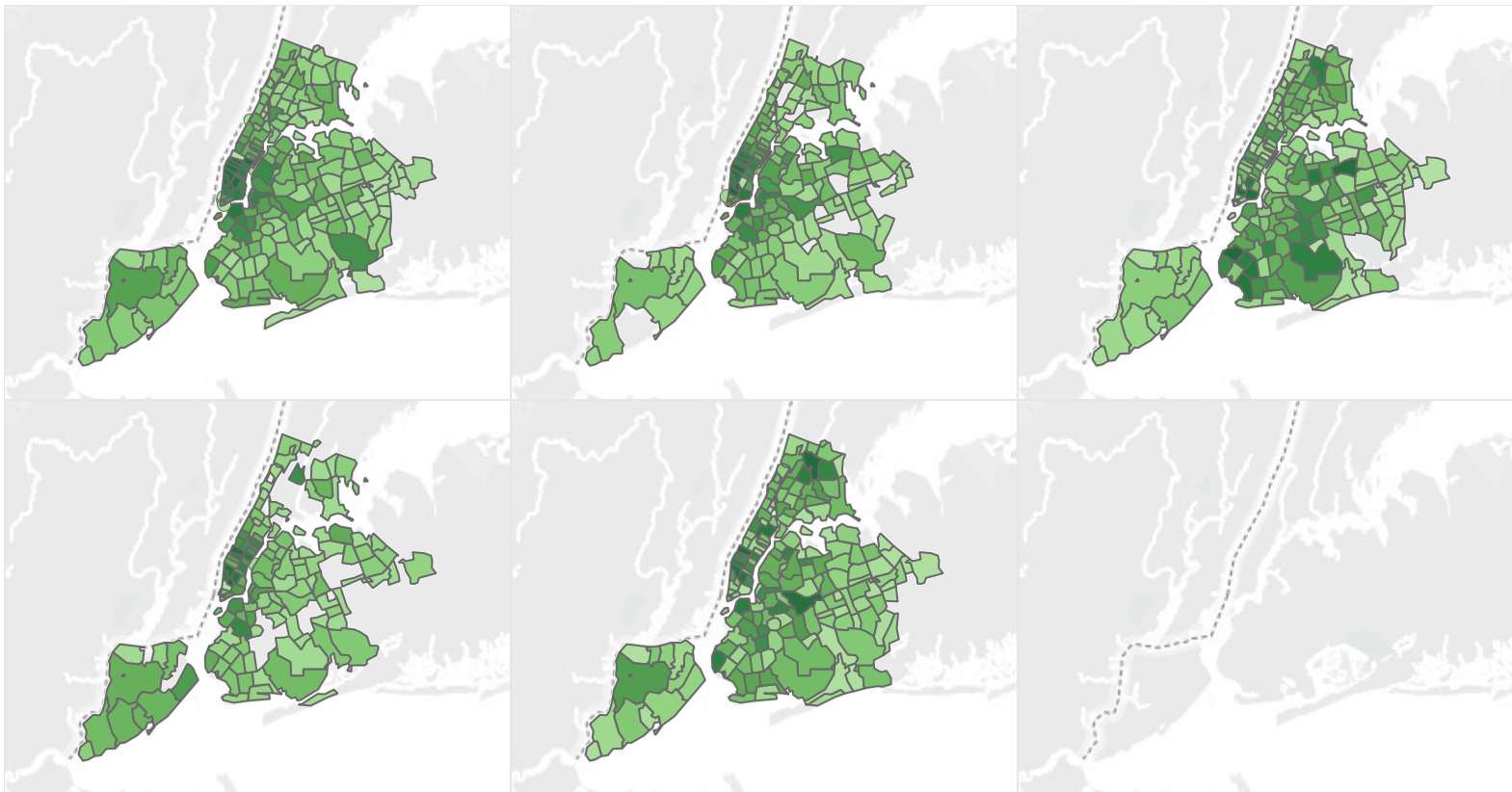
Question 4: How does the average score compare across different cuisine types? Are there cuisines that tend to have consistently lower/higher average scores compared to the others? NOTE: focus only on the top 5 most frequent "Cuisine Description" categories.

Average score per year for the top 5 most frequent cuisine types

CUISINE DESCRIPTION
- American
- Café/Coffee/Tea
- Chinese
- Italian
- Pizza
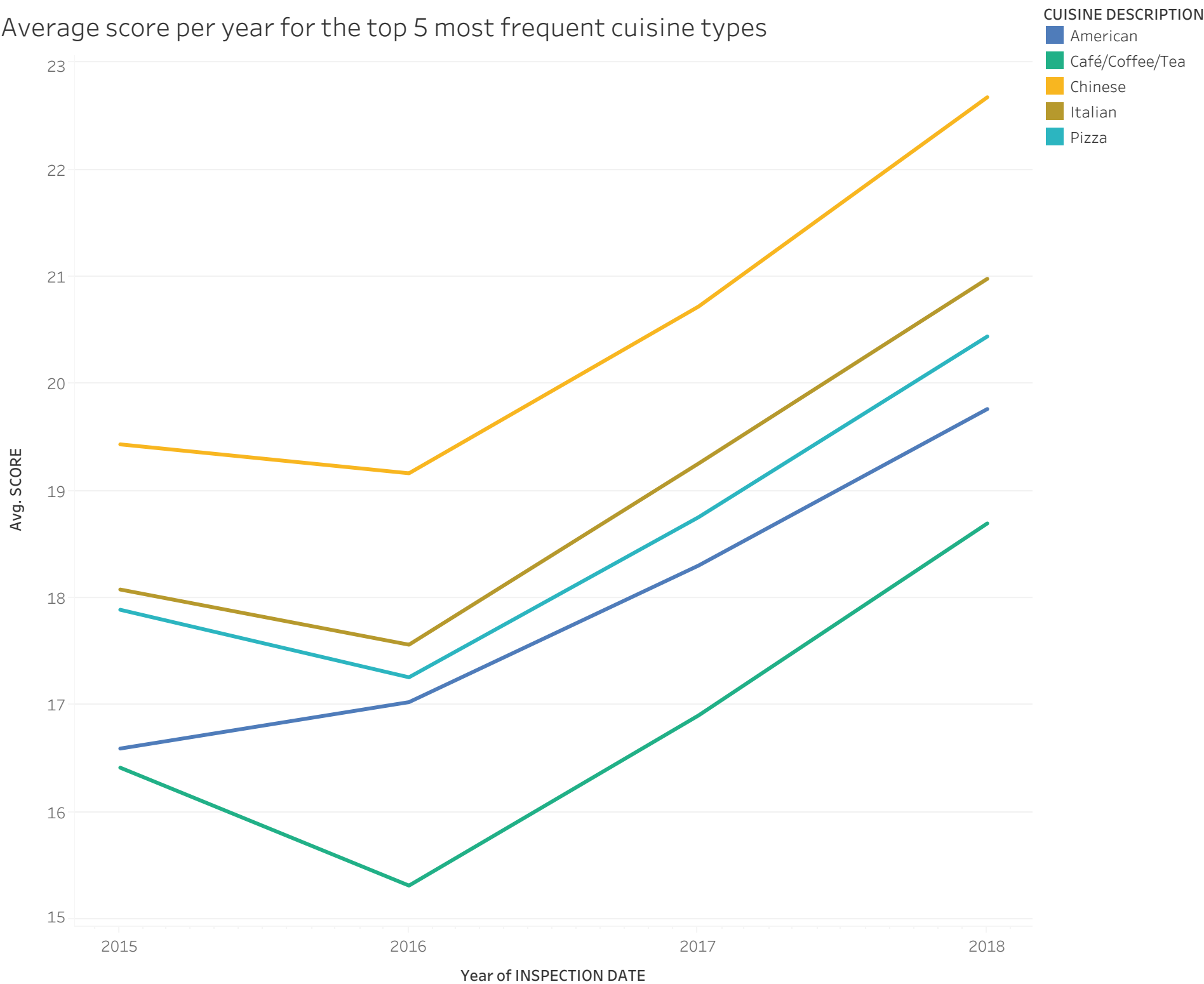
Showing the average score per year clearly shows that some cuisines consistently perform better than others. Using a line chart allows for easily comparing all cuisines in one graph. A representation per quarter (see below) contains more information but is less obvious.

Average score per quarter for the top 5 most frequent cuisine types

Question 5: Is there a relationship between cuisine type and violation? For instance, do some cuisine types tend to have more of some type of violations that other cuisine types?

Top 10 violations for the 10 most frequent cuisine types

		American	Bakery	Café/Cof..	Caribbean	Chinese	Italian	Japanese	Latin	Mexican	Pizza
02B	Hot food item not held at or above 140º F.	5,03%	8,13%	2,42%	12,71%	10,67%	5,50%	8,99%	10,73%	5,94%	11,46%
02G	Cold food item held above 41Âº F (smoked fish and reduced oxygen packaged foods above 38 ÂºF) except during necessary preparation.	8,35%	6,67%	7,55%	6,10%	9,97%	8,69%	8,76%	8,32%	8,94%	8,39%
04H	Raw, cooked or prepared food is adulterated, contaminated, cross-contaminated, or not discarded in accordance with HACCP plan.	4,41%	2,67%	3,24%	1,70%	1,83%	3,37%	2,63%	2,87%	2,78%	1,70%
04L	Evidence of mice or live mice present in facility's food and/or non-food areas.	8,72%	12,13%	8,52%	14,92%	11,89%	10,05%	11,70%	9,66%	10,05%	12,86%
04N	Filth flies or food/refuse/sewage-associated (FRSA) flies present in facility s food and/or non-food areas. Filth flies include house flies, little house flies, blow flies, bottle fli..	8,63%	8,51%	7,52%	10,40%	4,91%	7,36%	5,42%	9,68%	9,33%	6,35%
06C	Food not protected from potential source of contamination during storage, preparation, transportation, display or service.	8,89%	10,97%	9,53%	6,46%	11,69%	10,13%	10,83%	8,69%	10,12%	7,11%
06D	Food contact surface not properly washed, rinsed and sanitized after each use and following any activity when contamination may have occurred.	12,15%	7,43%	12,28%	3,74%	7,11%	12,74%	9,75%	8,08%	8,13%	8,00%
08A	Facility not vermin proof. Harborage or conditions conducive to attracting vermin to the premises and/or allowing vermin to exist.	14,51%	16,57%	13,86%	19,78%	15,42%	14,46%	14,84%	16,65%	16,74%	16,59%
10B	Plumbing not properly installed or maintained; anti-siphonage or backflow prevention device not provided where required; equipment or floor not properl..	9,04%	7,58%	9,11%	7,11%	6,24%	10,01%	7,86%	8,33%	9,23%	7,42%
10F	Non-food contact surface improperly constructed. Unacceptable material used. Non-food contact surface or equipment improperly maintained and/or not properly s..	20,27%	19,35%	25,97%	17,08%	20,27%	17,69%	19,23%	17,00%	18,73%	20,12%
Grand Total		100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%

The question does not name a number of cuisines or violations, but to make the graph comprehensible only the top 10 of most occuring violation types is shown. Showing more than the top 10 does not add much information, as is visible below where the top 20 is shown (labels excluded): Many cells now have the lightest color.

The description is also shown, because a code in itself is rather meaningless and otherwise would require a legend. Coloring is done by percentage of violation for the cuisine, and to make this obvious the totals of 100% are shown. It would have been nice to instead show the percentage that the shown violation types are to the total of all violations for the cuisine, but I could not realize that.

A color legend is not provided, because the percentages are shown in the cells.

Top 20 violations for the 20 most frequent cuisine types

		Am..	Asi..	Ba..	Caf..	Ca..	Chi..	Chi..	Del..	Do..	Ind..	Ital..	Ja..	Je..	Kor..	Lat..	Me..	Piz..	Piz..	Sp..	Thai
02B	Hot food item not held at or above 140º F.																				
02G	Cold food item held above 41Âº F (smoked fish and reduc..																				
02H	Food not cooled by an approved method whereby the int..																				
04A	Food Protection Certificate not held by supervisor of foo..																				
04H	Raw, cooked or prepared food is adulterated, contamina..																				
04L	Evidence of mice or live mice present in facility's food an..																				
04M	Live roaches present in facility's food and/or non-food ar..																				
04N	Filth flies or food/refuse/sewage-associated (FRSA) flies..																				
06A	Personal cleanliness inadequate. Outer garment soiled ..																				
06C	Food not protected from potential source of contaminati..																				
06D	Food contact surface not properly washed, rinsed and sa..																				
06E	Sanitized equipment or utensil, including in-use food dis..																				
06F	Wiping cloths soiled or not stored in sanitizing solution.																				
08A	Facility not vermin proof. Harborage or conditions condu..																				
08C	Pesticide use not in accordance with label or applicable l..																				
09B	Thawing procedures improper.																				
09C	Food contact surface not properly maintained.																				
10B	Plumbing not properly installed or maintained; anti-siph..																				
10F	Non-food contact surface improperly constructed. Unacc..																				
10H	Proper sanitization not provided for utensil ware washin..																				
Grand Total																					