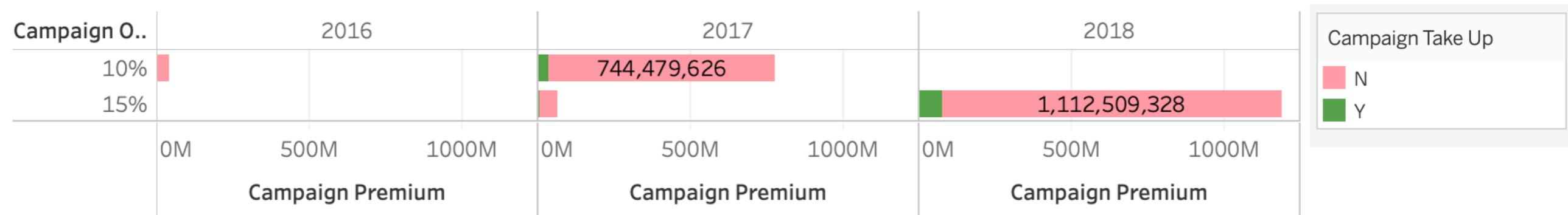


Phoenix Campaign Enhancement

Presentation May 2020

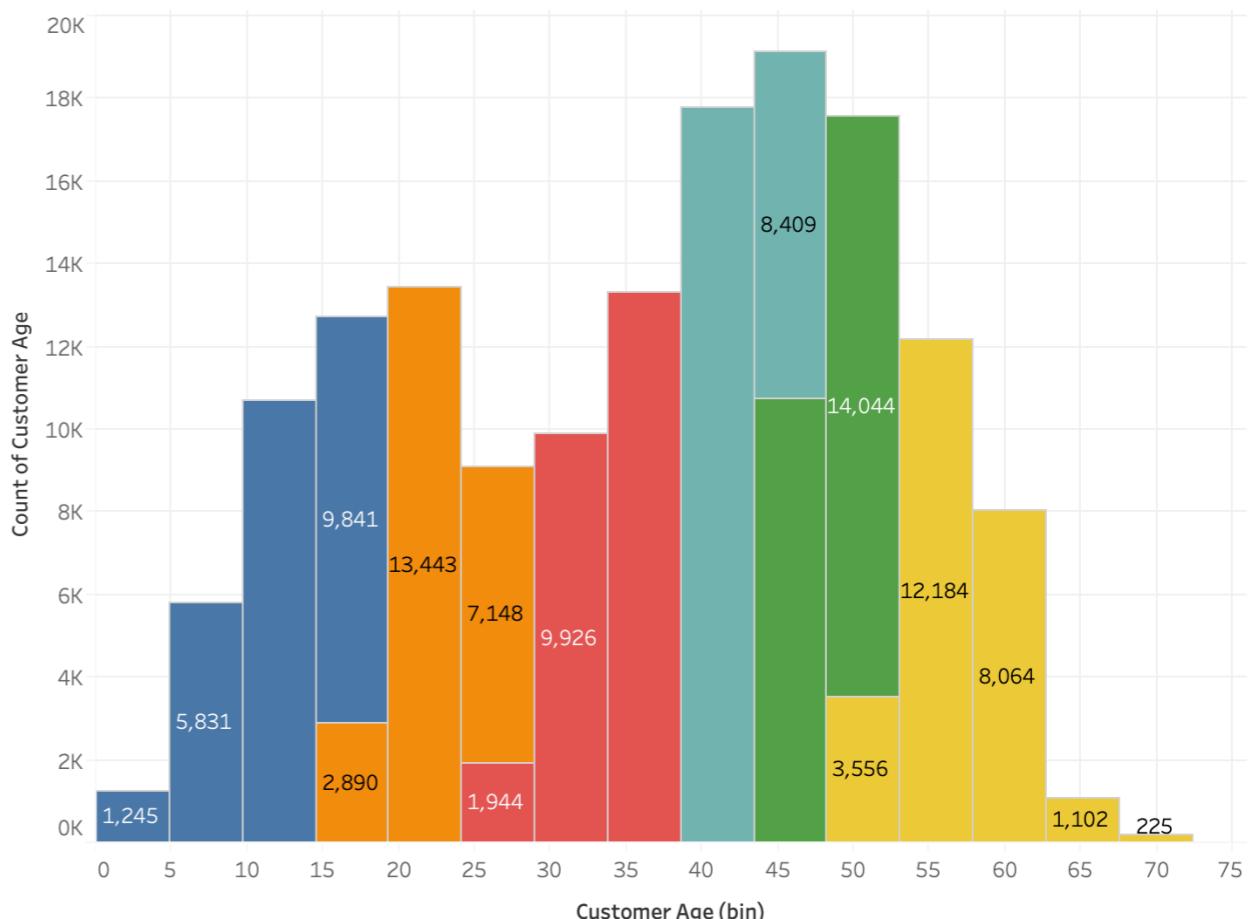
2016 - 2018



Age Range

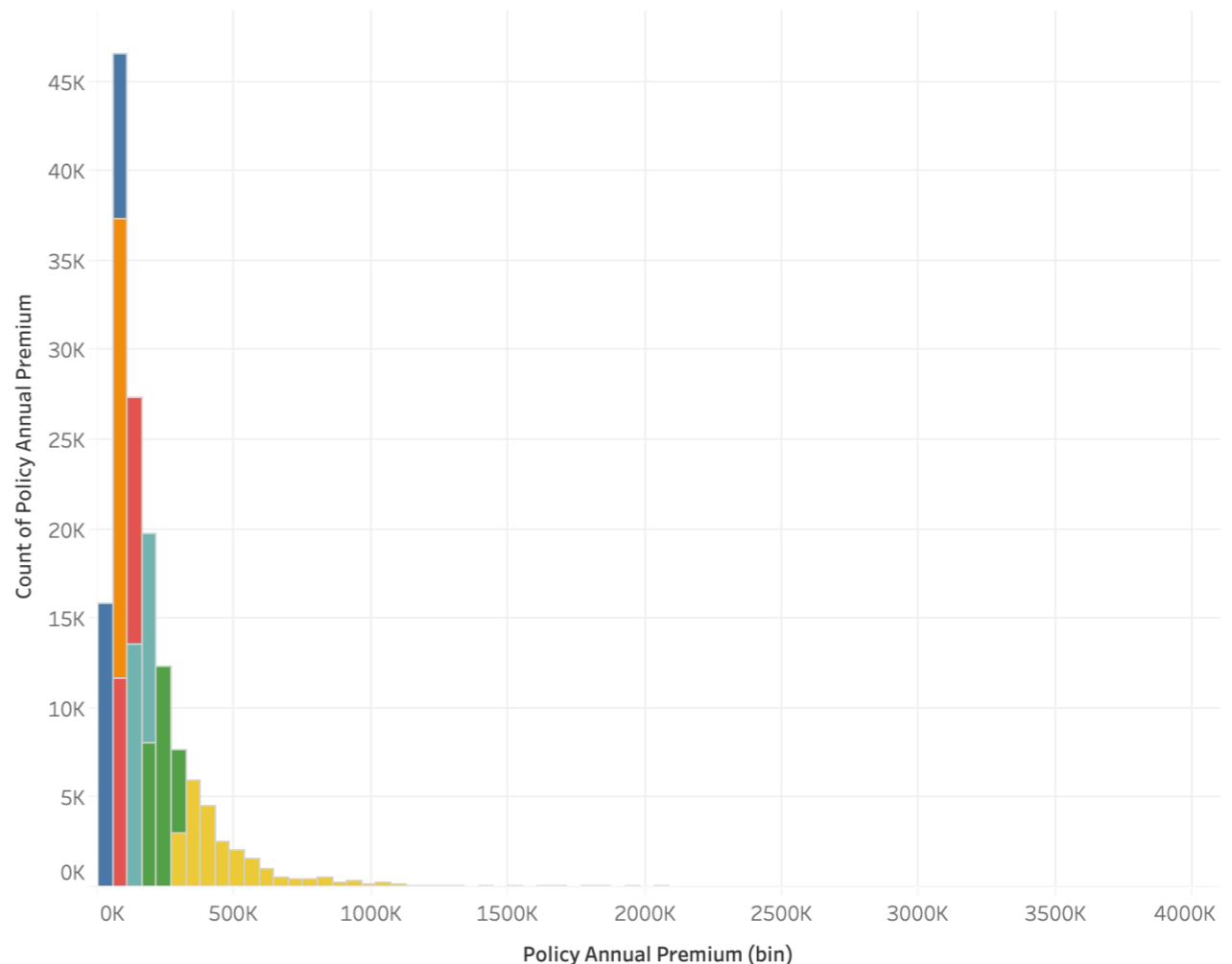
1 - 18
19 - 27
28 - 38
39 - 45
46 - 52
53+

Age distribution



Policy Annual Premium Range

1 - 60,000
60,001 - 88,000
88,001 - 130,000
130,000 - 190,000
190,001 - 300,000
300,001+



Age Range

Annual Range

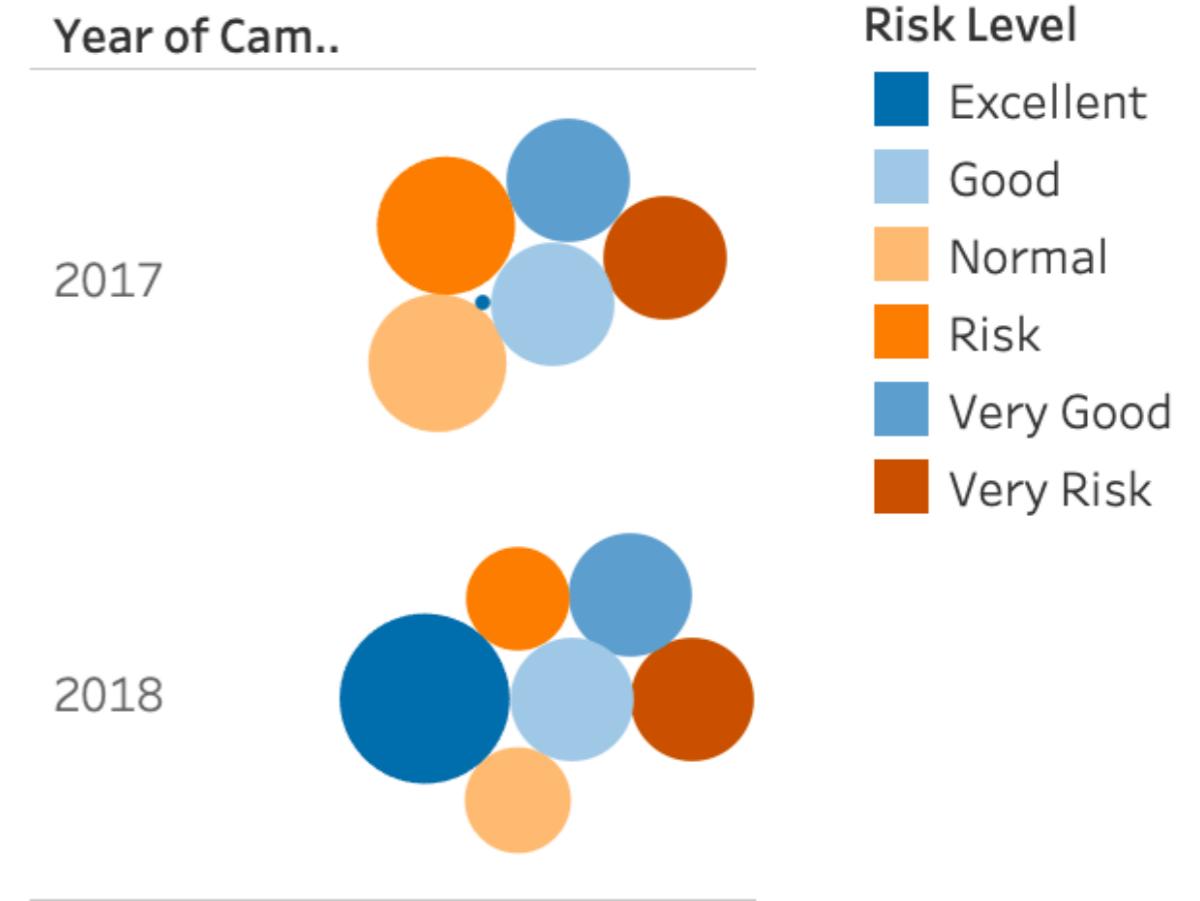
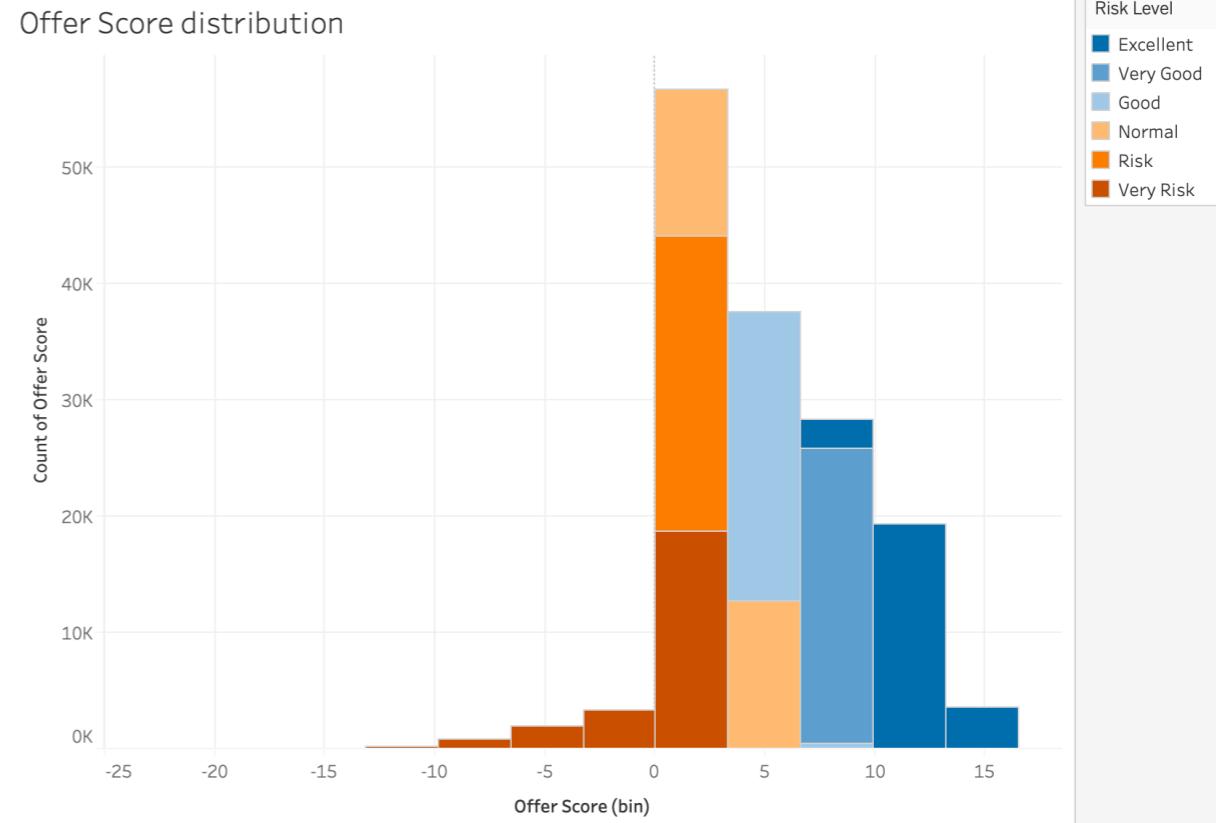
Actual Offer Percent =
Campaign Premium * 100 / Policy Annual Premium

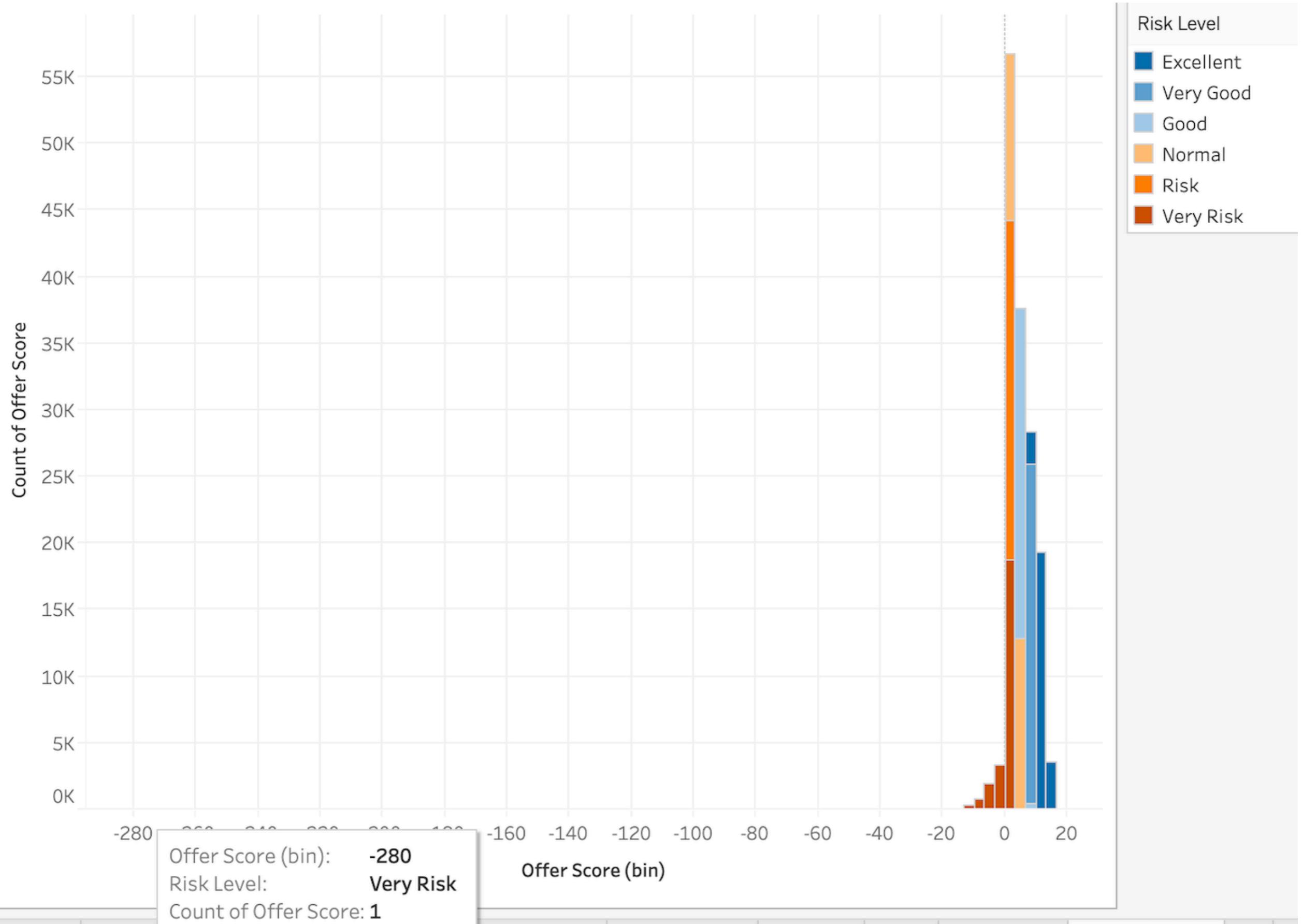
Offer Score =
Campaign Offer Percent - Actual Offer Percent



Risk Level

- Very Risk
(offer score ≤ 0.98)
- Risk
(offer score ≤ 2.41)
- Normal
(offer score ≤ 4.45)
- Good
(offer score ≤ 6.63)
- Very Good
(offer score ≤ 9.43)
- Excellent
(offer score > 9.43)





Hypothesis Testing

$$H_0: \mu_1 \leq \mu_2$$

$$H_1: \mu_1 > \mu_2$$

Null Hypothesis: Average Campaign Premium in 2018 (15%) is less than or equal to Average Campaign Premium in 2017 (10%)

Alternative Hypothesis: Average Campaign Premium in 2018 (15%) is greater than Average Campaign Premium in 2017 (10%)

Testing Criteria

- Age Range
- Annual Premium Range
- Customer Gender
- Customer Marital Status
- Campaign Offer Product
- Risk Level

Level 1 - Criteria

```
1 arr = ['age_range', 'customer_gender', 'cus_marital_status', 'annual_range', 'campaign_offer_product', 'risk_level']
2 r = 1
3 for each in rSubset(arr, r):
4     cols = [each_2 for each_2 in each]
5     print(cols)
```

```
['age_range']
['customer_gender']
['cus_marital_status']
['annual_range']
['campaign_offer_product']
['risk_level']
```

Level 2 - Criteria

```
1 arr = ['age_range', 'customer_gender', 'cus_marital_status', 'annual_range', 'campaign_offer_product', 'risk_level']
2 r = 2
3 for each in rSubset(arr, r):
4     cols = [each_2 for each_2 in each]
5     print(cols)
```

```
['age_range', 'customer_gender']
['age_range', 'cus_marital_status']
['age_range', 'annual_range']
['age_range', 'campaign_offer_product']
['age_range', 'risk_level']
['customer_gender', 'cus_marital_status']
['customer_gender', 'annual_range']
['customer_gender', 'campaign_offer_product']
['customer_gender', 'risk_level']
['cus_marital_status', 'annual_range']
['cus_marital_status', 'campaign_offer_product']
['cus_marital_status', 'risk_level']
['annual_range', 'campaign_offer_product']
['annual_range', 'risk_level']
['campaign_offer_product', 'risk_level']
```

Level 1 - Criteria

Total of 28 Criteria (excluding product H1, H2)

Average Campaign Premium in 2018 (15%) of **26** criteria is significantly greater than Average Campaign Premium in 2017 (10%)

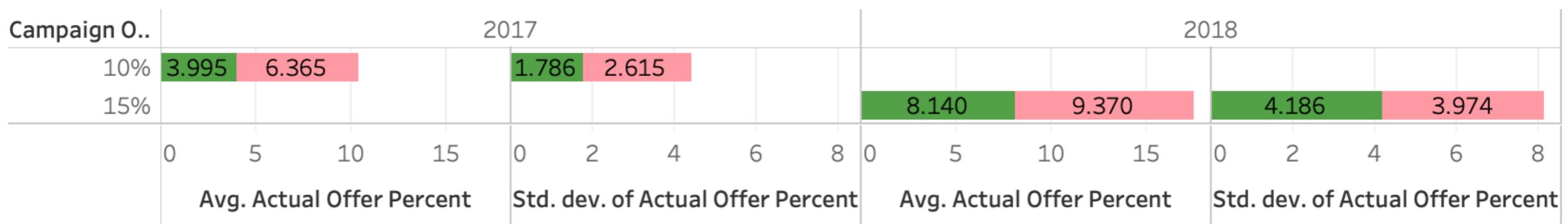
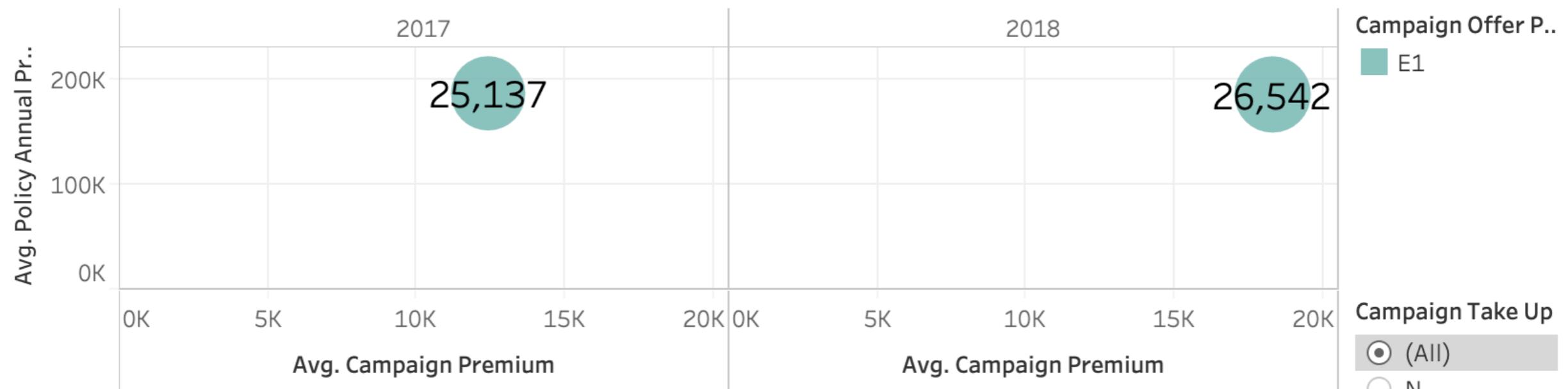
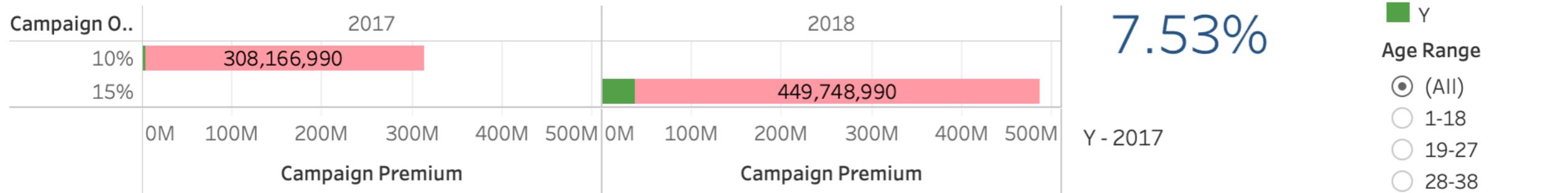
While Average Campaign Premium in 2018 (15%) of **2** criteria (A2, C1) is not significantly greater than Average Campaign Premium in 2017 (10%)

$$26 * 100 / 28 = 92.86\%$$

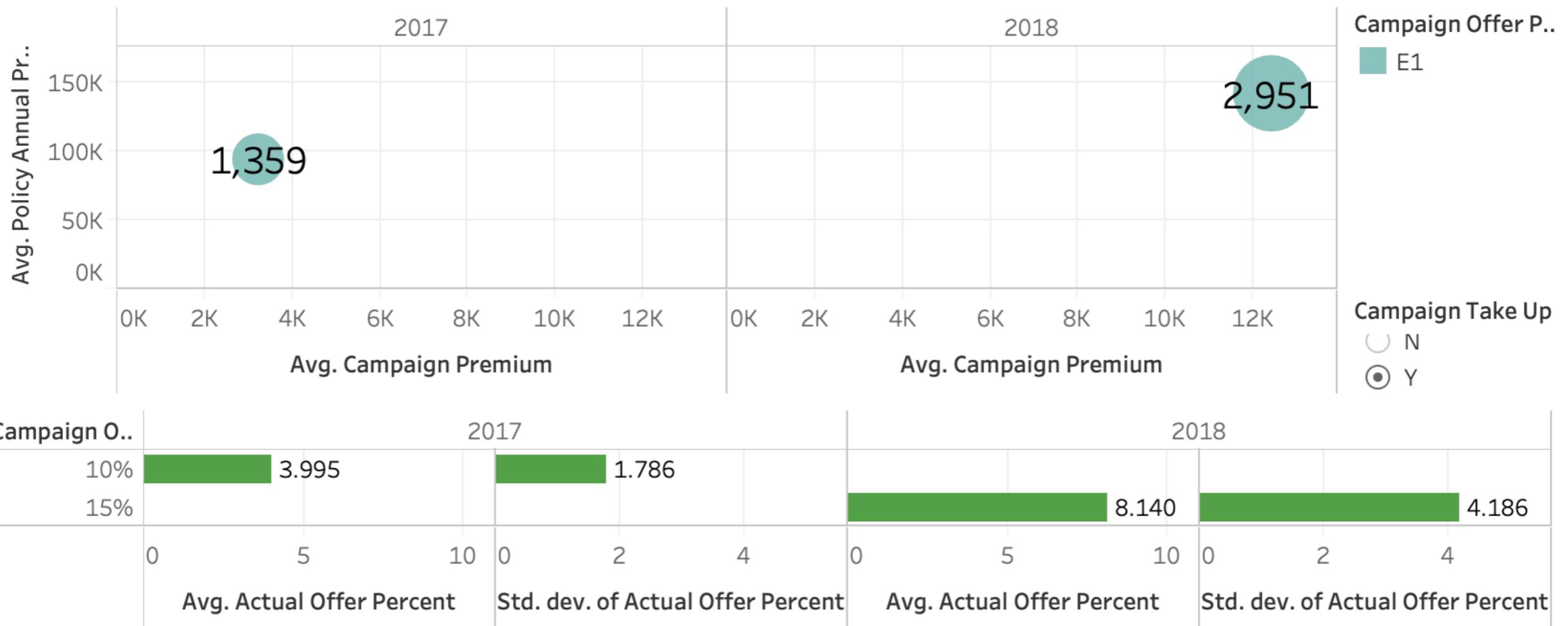
group	sample_2018_no	sample_2017_no	y_2018	y_2017	y_score	greater_p_value	premium_2018_Mean	premium_2017_Mean
E1	2951	1359	7.53	1.41	6.13	0.0	12,417.0	3,232.0
28-38	909	364	5.36	1.92	3.44	0.0	10,959.0	6,940.0
Very Good	1217	714	7.24	3.93	3.32	0.0	8,191.0	4,033.0
Good	2471	1809	7.67	4.4	3.27	0.0	9,158.0	4,021.0
1-18	1487	1029	7.73	4.57	3.17	0.0	5,864.0	4,405.0
01 Single	3679	2294	7.13	4.08	3.05	0.0	7,992.0	4,984.0
190,001-300,0000	812	377	5.85	2.88	2.97	0.0	17,536.0	12,208.0
300,001+	604	226	4.18	1.5	2.68	0.0	32,529.0	22,385.0
19-27	1731	1175	10.19	7.69	2.5	0.0	6,814.0	4,518.0
F	3103	2092	5.8	3.45	2.35	0.0	11,647.0	6,720.0
Very Risk	840	834	5.55	3.26	2.3	0.0	18,643.0	9,136.0
130,000-190,000	975	543	6.9	4.61	2.29	0.0	12,070.0	9,074.0
46-52	923	770	5.91	3.62	2.29	0.0	15,164.0	7,074.0
39-45	862	613	4.76	2.68	2.08	0.0	13,366.0	7,010.0
00 NA	1195	874	5.34	3.42	1.93	0.0	13,771.0	7,694.0
M	3821	2968	7.0	5.13	1.87	0.0	10,358.0	6,391.0
Risk	1479	1945	5.42	3.74	1.68	0.0	19,299.0	8,725.0
04 Divorce	43	44	5.53	4.05	1.48	0.0	14,504.0	6,559.0
02 Maried	1959	1816	6.38	4.97	1.41	0.0	14,534.0	7,841.0

Overall - E1

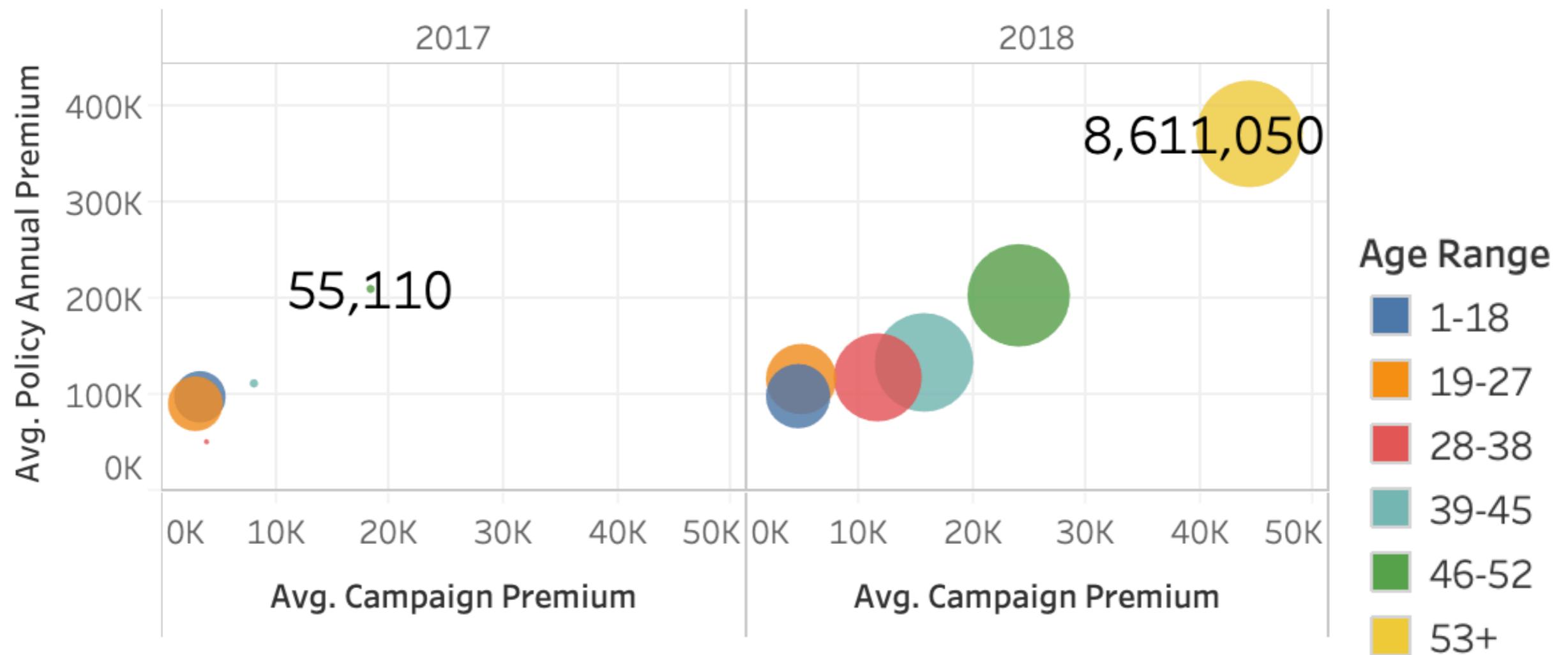
Campaign Premium 17/18



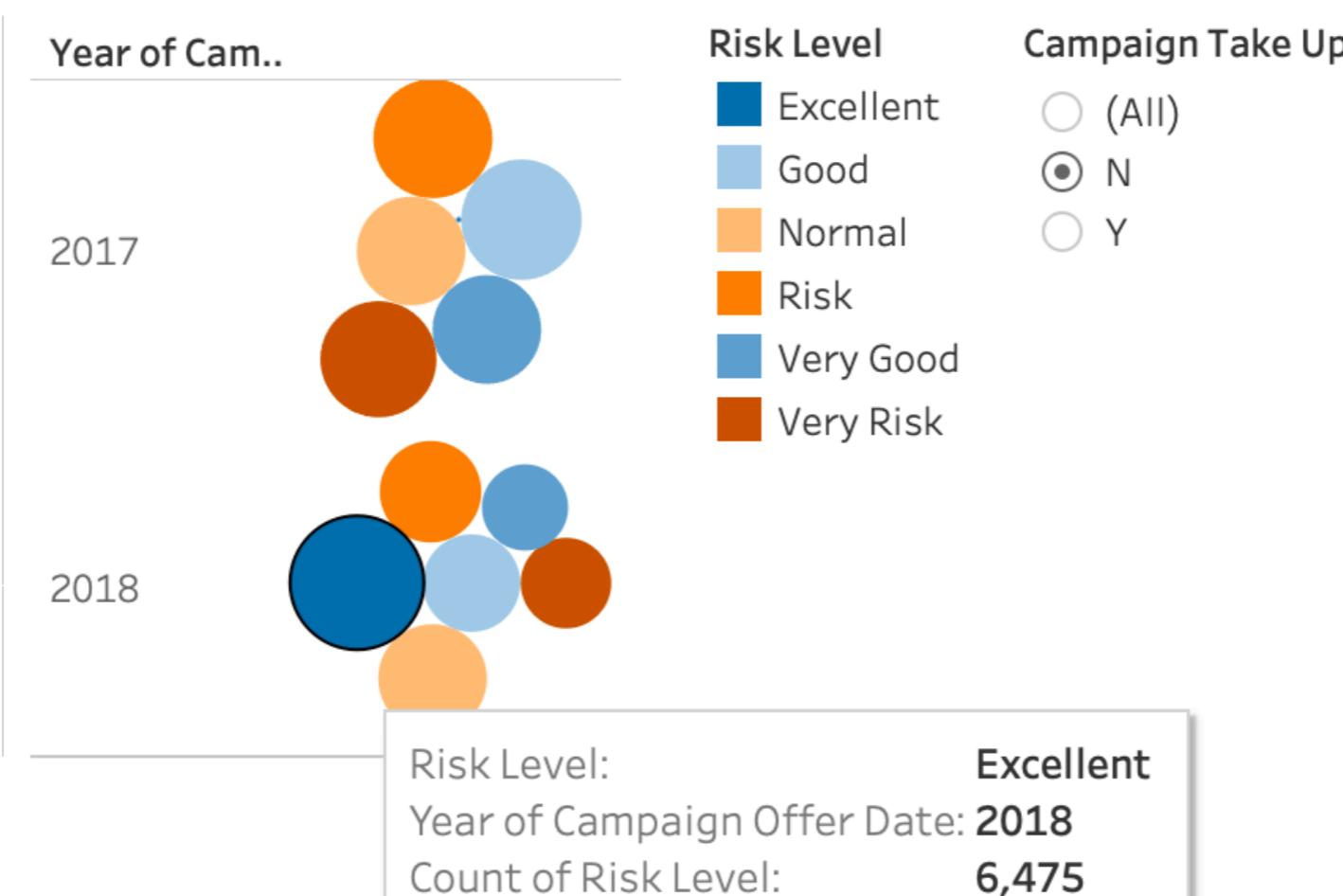
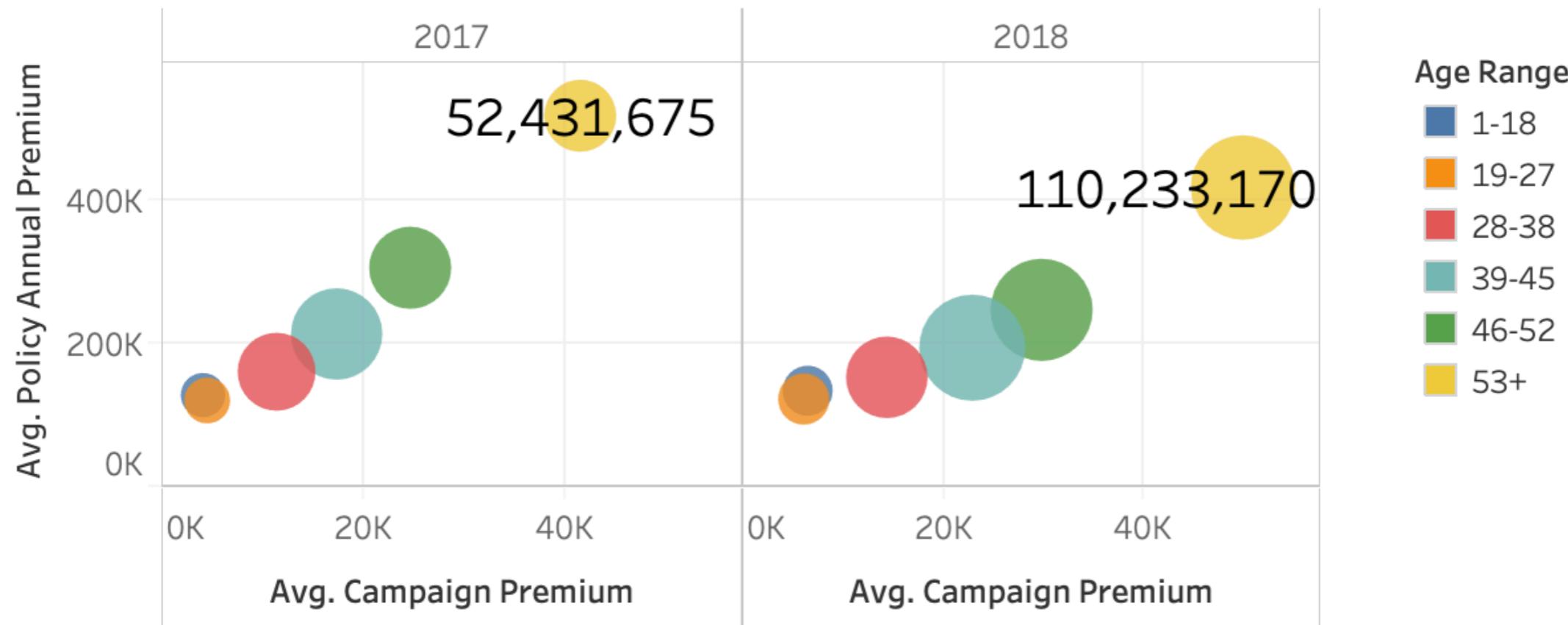
E1 - Campaign Take Up = Yes



E1 - Campaign Take Up = Yes



E1 - Campaign Take Up = No



Level 2 - Criteria

Total of 262 Criteria

Average Campaign Premium in 2018 (15%) of **239** criteria is significantly greater than Average Campaign Premium in 2017 (10%)

While Average Campaign Premium in 2018 (15%) of **23** criteria (A1:2, A2:11, C1:9, 19-27 Married) is not significantly greater than Average Campaign Premium in 2017 (10%)

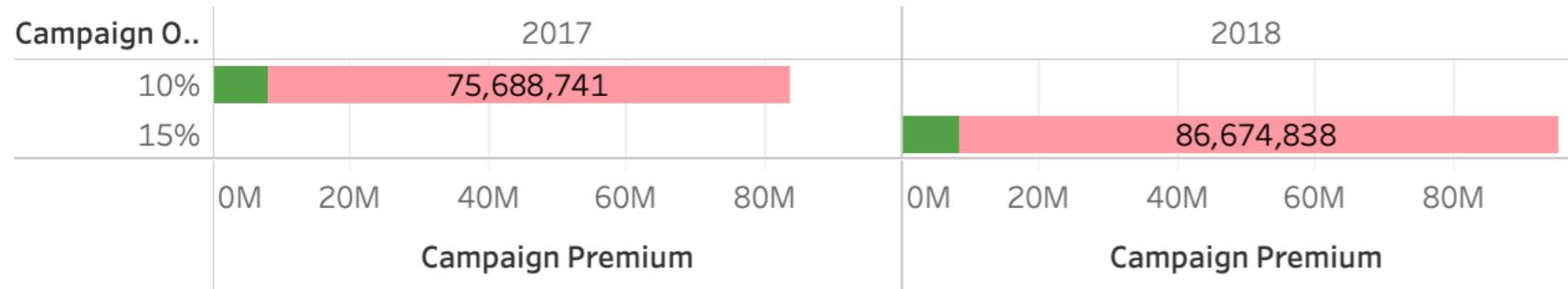
$$239 * 100 / 262 = 91.22\%$$

group	sample_2018_no	sample_2017_no	y_2018	y_2017	y_score	greater_p_value	premium_2018_Mean	premium_2017_Mean
88,001-130,0000_E1	421	117	10.51	1.76	8.75	0.0	9,584.0	2,942.0
C1_Good	120	42	11.17	2.49	8.69	0.0	13,453.0	6,978.0
60,001-88,000_E1	631	306	13.48	5.03	8.45	0.0	5,647.0	2,686.0
02 Maried_E1	719	32	7.49	0.16	7.33	0.0	19,822.0	6,089.0
130,000-190,000_E1	421	119	8.86	1.59	7.28	0.0	13,702.0	5,155.0
E1_Very Risk	262	44	7.0	0.27	6.73	0.0	30,629.0	7,358.0
F_E1	1433	394	7.43	0.73	6.69	0.0	13,946.0	3,221.0
E1_Normal	434	74	7.03	0.49	6.54	0.0	17,531.0	3,530.0
190,001-300,0000_E1	373	100	7.36	0.95	6.41	0.0	21,974.0	6,771.0
E1_Risk	368	56	6.63	0.4	6.23	0.0	22,362.0	6,570.0
28-38_60,001-88,000	219	87	10.55	4.54	6.01	0.0	7,448.0	4,728.0
1-18_Risk	32	106	8.46	2.46	6.0	0.0	8,907.0	5,447.0
19-27_Good	405	387	12.35	6.7	5.65	0.0	7,738.0	2,920.0
01 Single_E1	1667	1128	8.75	3.24	5.51	0.0	7,651.0	2,992.0
00 NA_E1	538	197	6.41	0.97	5.44	0.0	16,795.0	4,094.0
M_E1	1518	965	7.66	2.24	5.43	0.0	10,974.0	3,237.0
A1_Good	664	364	10.47	5.23	5.24	0.0	7,172.0	5,942.0
300,001+_E1	275	42	5.51	0.29	5.22	0.0	45,414.0	10,405.0
02 Maried_Very Good	196	78	7.34	2.2	5.14	0.0	11,259.0	4,905.0

group	sample_2018_no	sample_2017_no	y_2018	y_2017	y_score	greater_p_value	premium_2018_Mean	premium_2017_Mean
88,001-130,0000_A1	356	481	6.9	9.05	-2.15	1.0	7,108.0	7,135.0
F_C1	263	275	7.2	8.51	-1.3	1.0	10,310.0	10,788.0
53+_C1	232	230	9.79	10.8	-1.01	1.0	20,259.0	21,268.0
00 NA_C1	123	126	7.1	7.71	-0.6	1.0	13,328.0	14,358.0
00 NA_A2	157	72	2.91	3.19	-0.28	1.0	14,061.0	16,568.0
300,001+_C1	127	83	6.18	6.33	-0.15	1.0	21,089.0	29,863.0
39-45_A2	182	84	2.96	2.82	0.14	1.0	14,986.0	15,589.0
F_A2	456	184	3.11	2.73	0.38	1.0	13,508.0	13,887.0
02 Maried_A2	565	213	4.2	3.75	0.45	1.0	13,113.0	13,125.0
46-52_A2	207	63	3.36	2.64	0.72	1.0	13,841.0	15,857.0
28-38_A2	133	56	2.87	2.07	0.8	1.0	14,898.0	14,953.0
M_A2	529	180	4.42	3.48	0.94	1.0	13,860.0	14,502.0
01 Single_A2	221	65	3.24	1.85	1.39	1.0	15,153.0	15,213.0
A2_Very Risk	469	97	4.15	2.5	1.66	1.0	12,651.0	18,800.0
190,001-300,0000_C1	124	70	9.58	7.78	1.8	1.0	13,240.0	19,354.0
53+_1-60,000	43	117	5.99	19.2	-13.21	0.0	11,006.0	4,500.0
46-52_1-60,000	58	156	6.76	18.3	-11.54	0.0	10,284.0	4,500.0
53+_60,001-88,000	190	370	8.18	18.63	-10.45	0.0	11,542.0	5,080.0
1-60,000_Very Risk	189	352	6.63	15.77	-9.14	0.0	10,121.0	4,435.0

Overall - C1

Campaign Premium 17/18

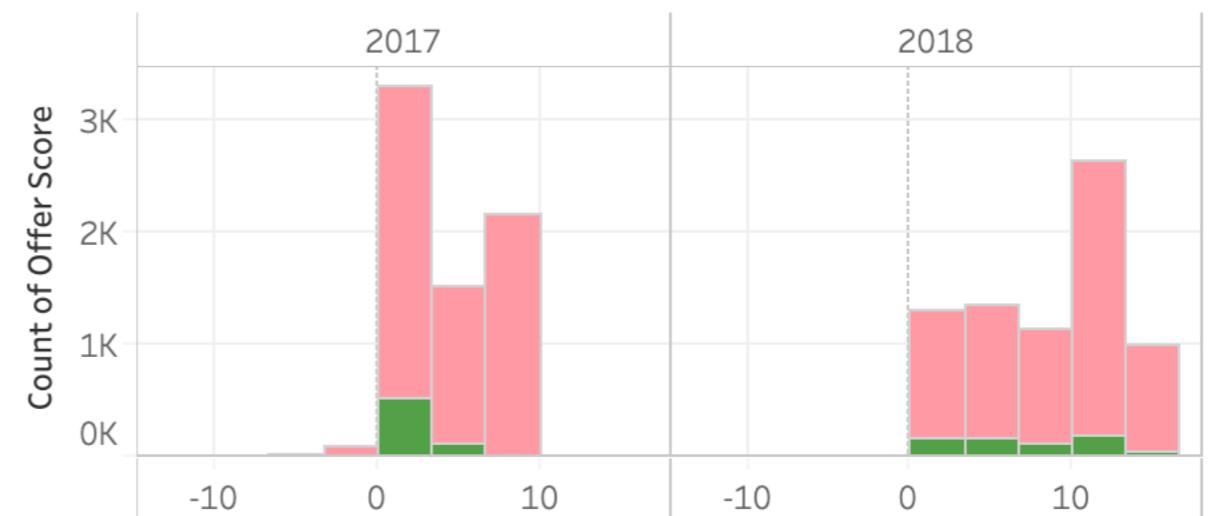


Y - 2018

8.87%

Y - 2017

9.33%



Campaign Take Up

N

Y

Age Range

(All)

1-18

19-27

28-38

39-45

46-52

53+

Annual Range

(All)

1-60,000

60,001-88,000

88,001-130,000

130,000-190,000

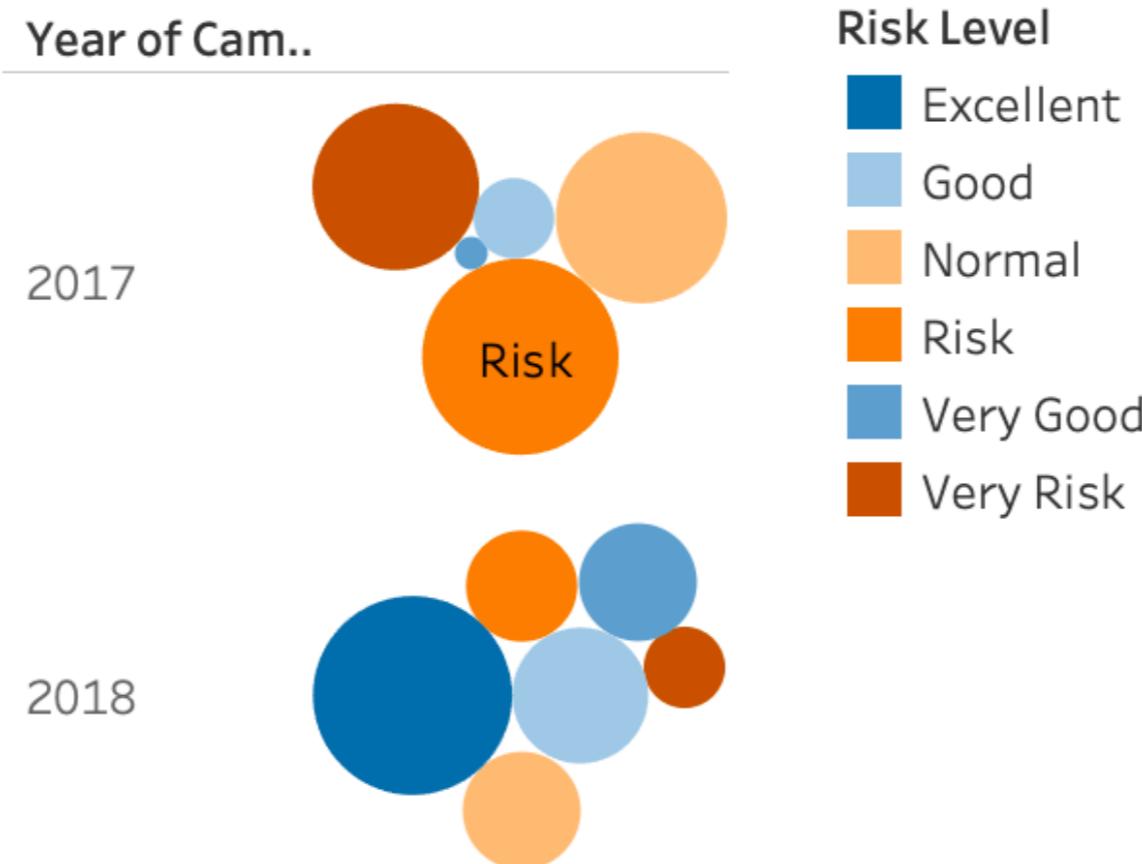
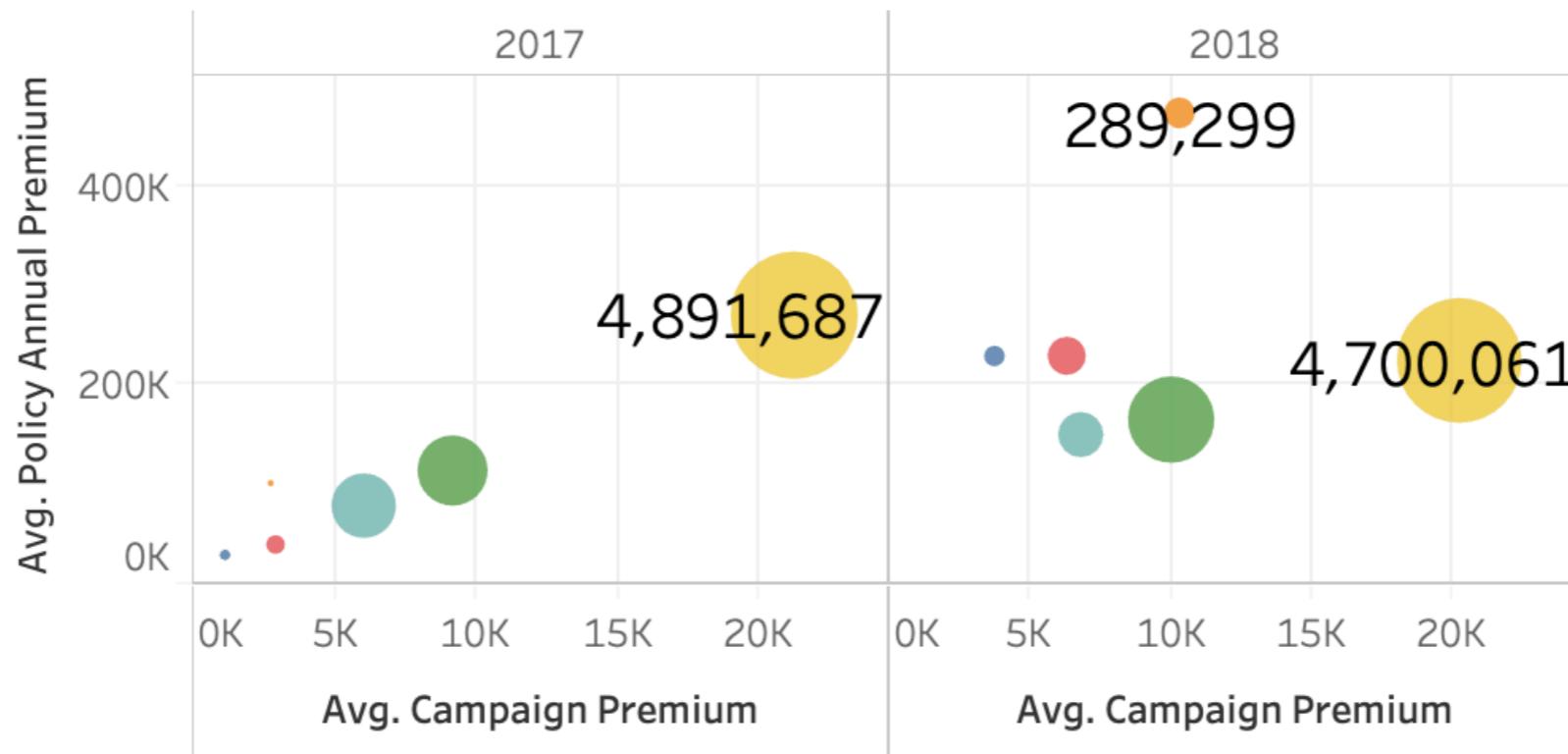
190,001-300,000

300,001+

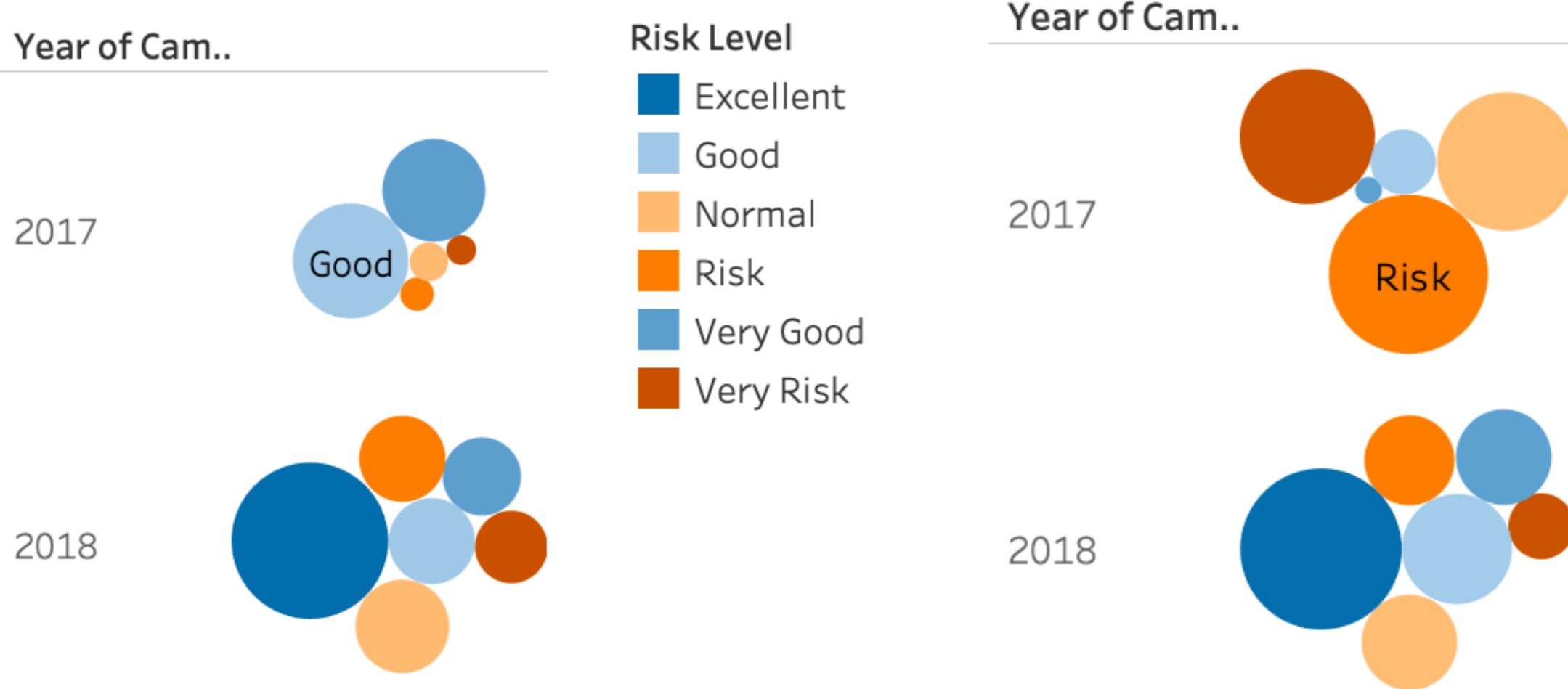
Overall - C1



C1 - Campaign Take Up = Yes

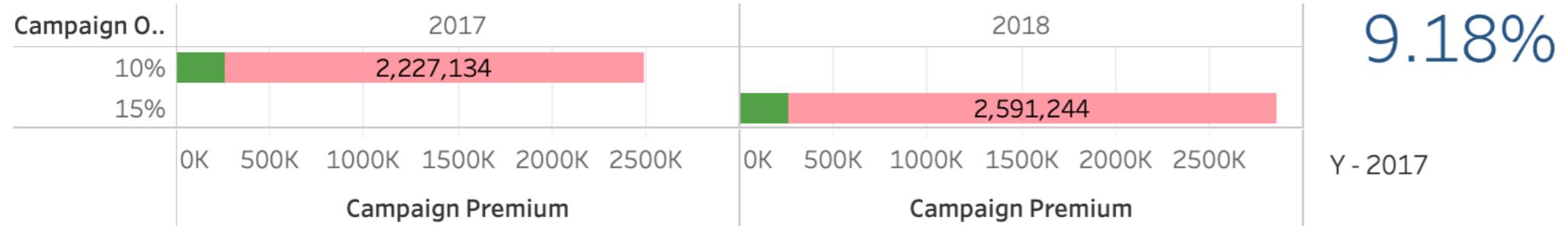


E1 (Yes) vs C1 (Yes)



Overall 19 - 27 Married

Campaign Premium 17/18



Y - 2018

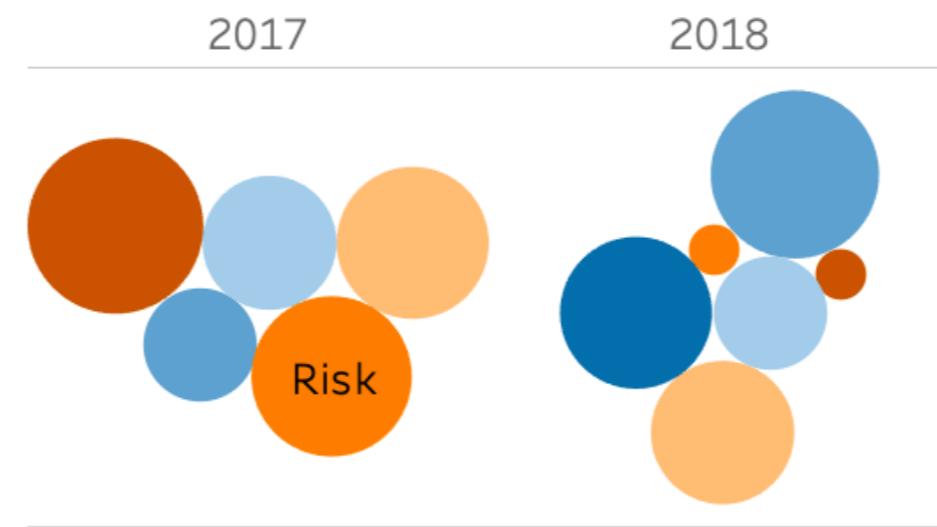
9.18%

Y - 2017

10.54%

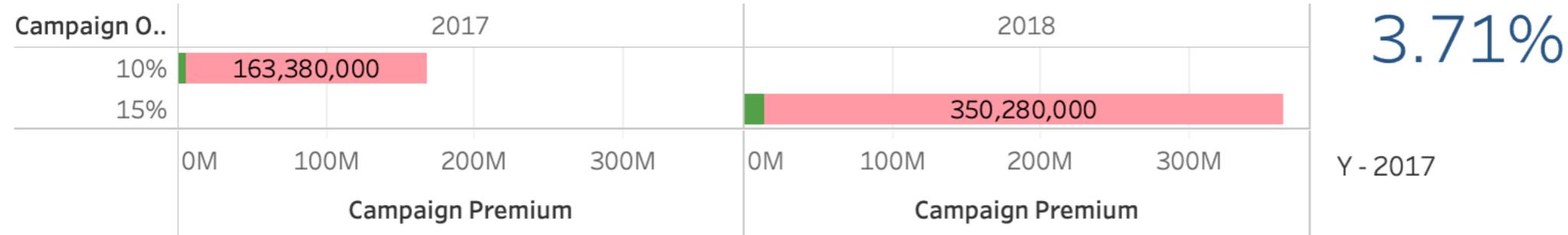
- Campaign Take Up
N
Y
- Age Range
(All)
1-18
19-27 (selected)
28-38
39-45
46-52

19 - 27 Married (Yes)



Overall A2 (11 False of 17)

Campaign Premium 17/18



Campaign Take Up

N

Y

Age Range

(All)

1-18

19-27

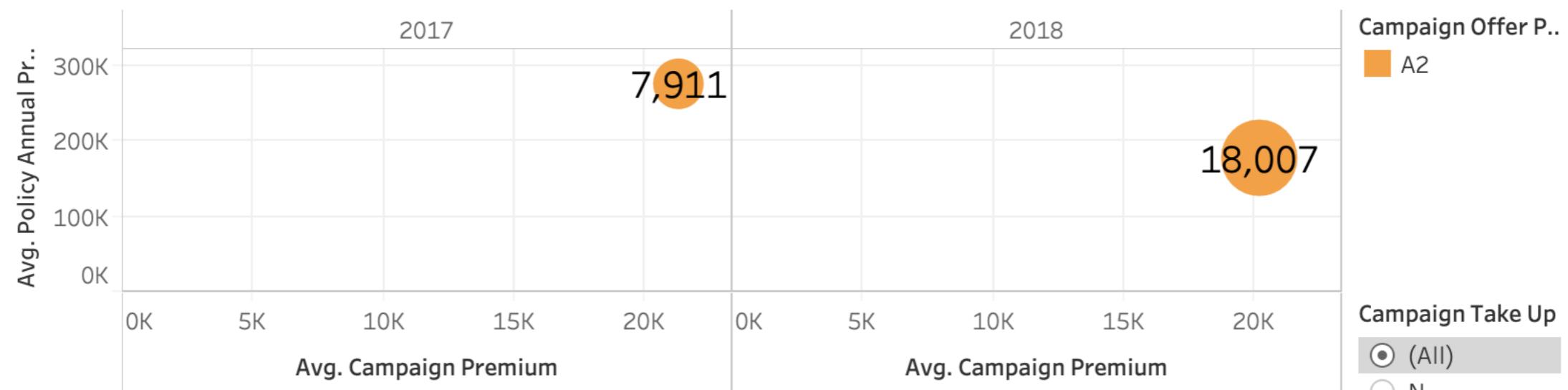
28-38

39-45

46-52

3.71%

3.06%



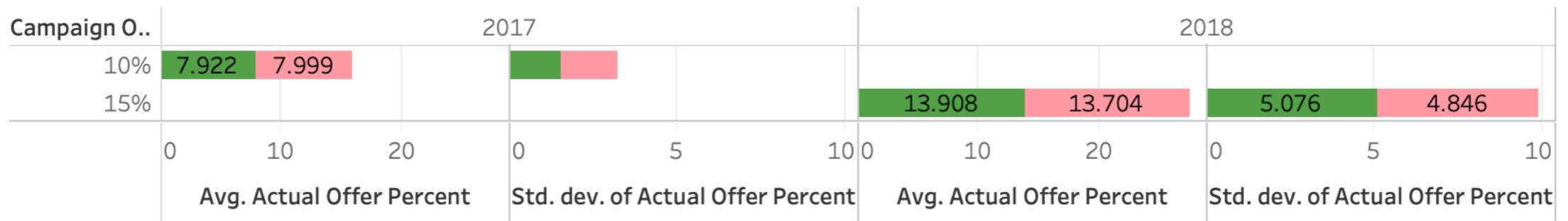
Campaign Offer P..

A2

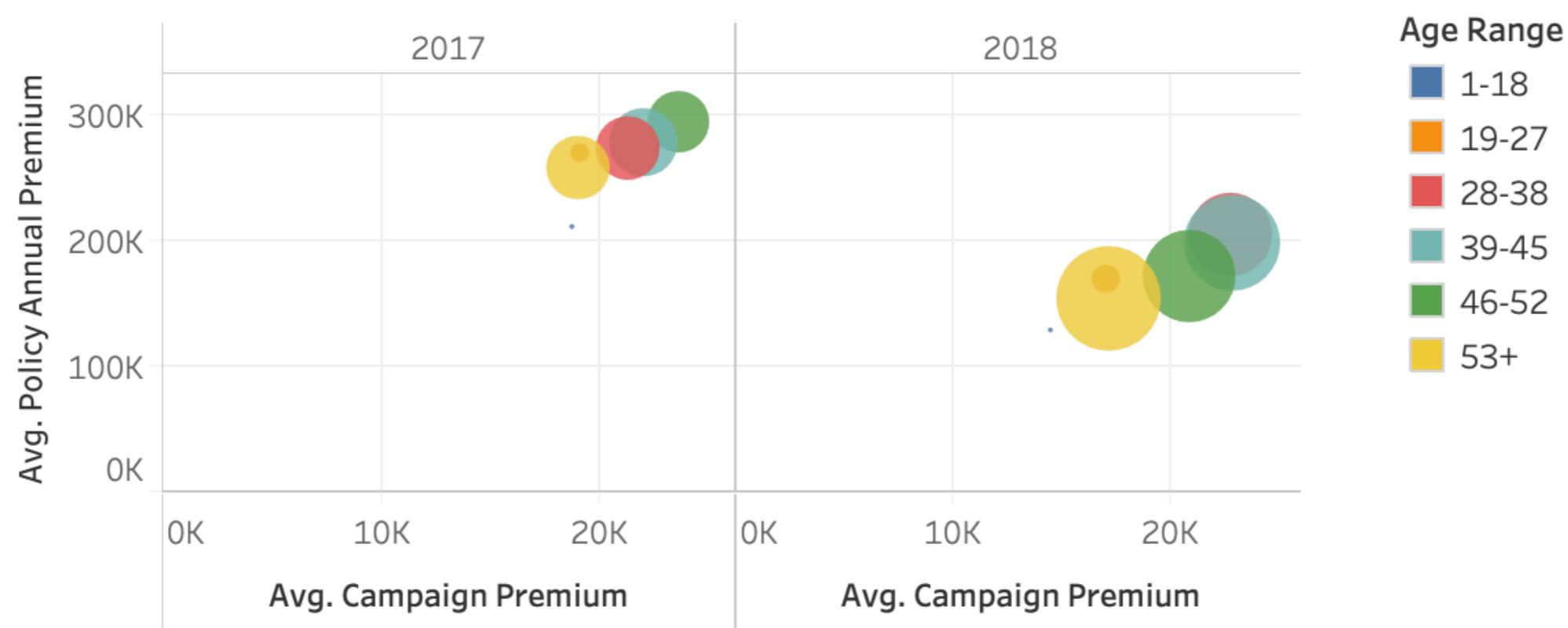
Campaign Take Up

(All)

N



Reduced Policy Annual Premium in A2



Level 3 - Criteria

Total of 874 Criteria

Average Campaign Premium in 2018 (15%) of **742** criteria is significantly greater than Average Campaign Premium in 2017 (10%)

While Average Campaign Premium in 2018 (15%) of **132** criteria (A1:37, A2:36, C1:36, E1:2) is not significantly greater than Average Campaign Premium in 2017 (10%)

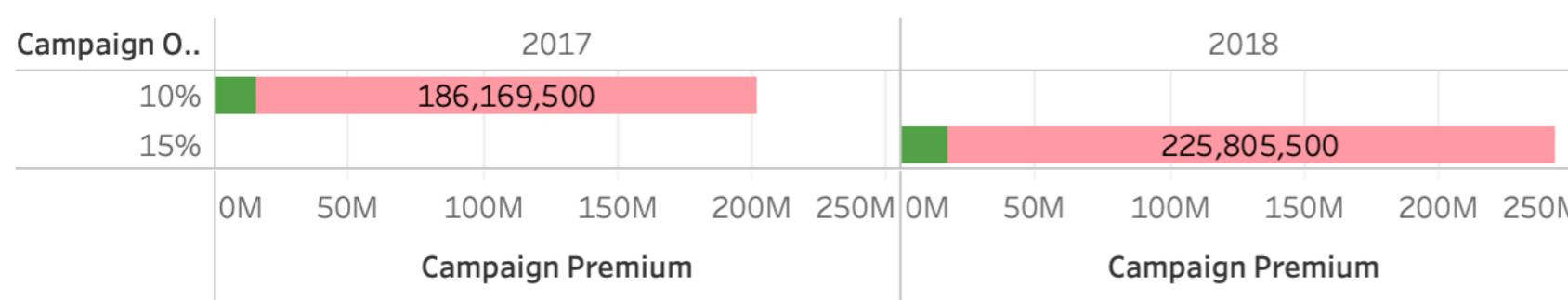
$$742 * 100 / 874 = 84.89\%$$

group	sample_2018_no	sample_2017_no	y_2018	y_2017	y_score	greater_p_value	premium_2018_Mean	premium_2017_Mean
1-60,000_E1_Risk	51	29	15.36	4.07	11.29	0.0	6,074.0	3,106.0
01 Single_C1_Good	16	25	13.21	2.2	11.01	0.0	12,869.0	2,853.0
F_60,001-88,000_E1	265	65	13.1	2.32	10.78	0.0	6,171.0	2,603.0
00 NA_60,001-88,000_E1	57	21	14.39	3.73	10.66	0.0	6,383.0	2,240.0
00 NA_88,001-130,0000_E1	80	27	12.78	2.5	10.28	0.0	9,605.0	2,384.0
F_88,001-130,0000_E1	202	34	10.81	1.01	9.8	0.0	10,119.0	2,947.0
28-38_1-60,000_Normal	32	20	13.15	3.56	9.59	0.0	5,508.0	2,917.0
00 NA_1-60,000_E1	73	45	17.59	8.33	9.26	0.0	3,715.0	1,990.0
19-27_F_Good	171	112	12.49	3.93	8.56	0.0	8,107.0	2,902.0
39-45_1-60,000_Risk	20	71	22.31	13.81	8.5	0.0	6,370.0	4,442.0
F_130,000-190,000_E1	228	43	8.91	1.01	7.9	0.0	14,590.0	5,258.0
M_88,001-130,0000_E1	219	83	10.22	2.53	7.7	0.0	9,091.0	2,940.0
01 Single_60,001-88,000_Risk	64	30	14.59	7.03	7.56	0.0	9,488.0	6,049.0
00 NA_130,000-190,000_E1	139	38	8.79	1.25	7.54	0.0	13,479.0	3,954.0
28-38_M_60,001-88,000	139	49	12.03	4.56	7.46	0.0	7,627.0	4,813.0
F_1-60,000_E1	389	211	13.82	6.66	7.16	0.0	3,311.0	2,141.0
F_E1_Normal	249	20	7.44	0.28	7.16	0.0	17,863.0	4,006.0
19-27_300,001+_E1	43	19	11.63	4.58	7.05	0.0	14,227.0	9,387.0
F_C1_Good	20	17	8.16	1.18	6.98	0.0	15,005.0	4,229.0

group	sample_2018_no	sample_2017_no	y_2018	y_2017	y_score	greater_p_value	premium_2018_Mean	premium_2017_Mean
53+_88,001-130,0000_A1	31	166	4.77	13.59	-8.82	1.0	5,129.0	7,383.0
02 Maried_88,001-130,0000_A1	106	242	7.84	13.21	-5.37	1.0	5,533.0	7,196.0
39-45_88,001-130,0000_A1	46	49	8.38	11.88	-3.5	1.0	5,543.0	7,255.0
46-52_88,001-130,0000_A1	63	94	8.49	11.33	-2.84	1.0	5,167.0	6,957.0
46-52_130,000-190,000_C1	20	36	7.32	10.08	-2.76	1.0	8,274.0	10,282.0
53+_F_C1	87	97	8.72	10.31	-1.58	1.0	17,170.0	20,522.0
F_300,001+_C1	58	39	4.82	6.31	-1.49	1.0	15,455.0	27,554.0
00 NA_A2_Very Risk	90	30	3.44	3.66	-0.22	1.0	13,000.0	22,012.0
M_A2_Very Risk	254	44	4.85	2.77	2.07	1.0	12,617.0	20,651.0
F_190,001-300,0000_C1	45	17	7.84	4.75	3.1	1.0	9,933.0	20,567.0
39-45_A2_Very Risk	81	24	3.3	2.65	0.64	0.999	13,028.0	23,188.0
M_190,001-300,0000_C1	79	53	10.45	10.01	0.43	0.998	15,124.0	18,965.0
F_A2_Very Risk	215	53	3.56	2.27	1.28	0.998	12,691.0	17,264.0
00 NA_300,001+_C1	23	18	3.74	4.39	-0.65	0.997	18,833.0	29,414.0
00 NA_190,001-300,0000_C1	32	22	10.61	8.05	2.55	0.997	15,163.0	20,829.0
F_130,000-190,000_C1	47	42	8.29	12.36	-4.07	0.995	10,818.0	13,592.0
02 Maried_300,001+_C1	57	49	7.65	8.76	-1.12	0.995	23,932.0	30,507.0
02 Maried_190,001-300,0000_C1	48	41	8.41	9.17	-0.76	0.994	14,964.0	18,978.0
46-52_A2_Very Risk	128	22	4.24	2.41	1.83	0.994	12,712.0	19,705.0

Overall A1 (37 False of 121)

Campaign Premium 17/18



Y - 2018

7.06%

Y - 2017

7.61%

Campaign Take Up

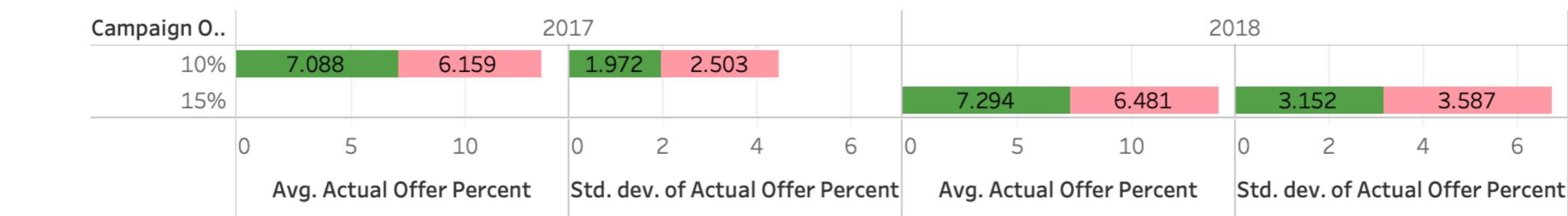
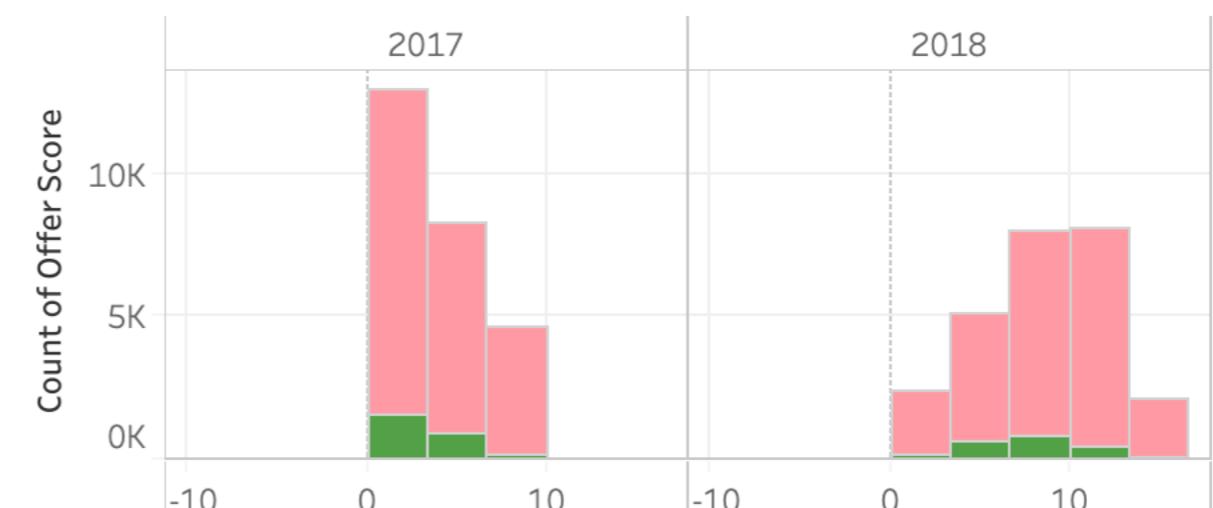
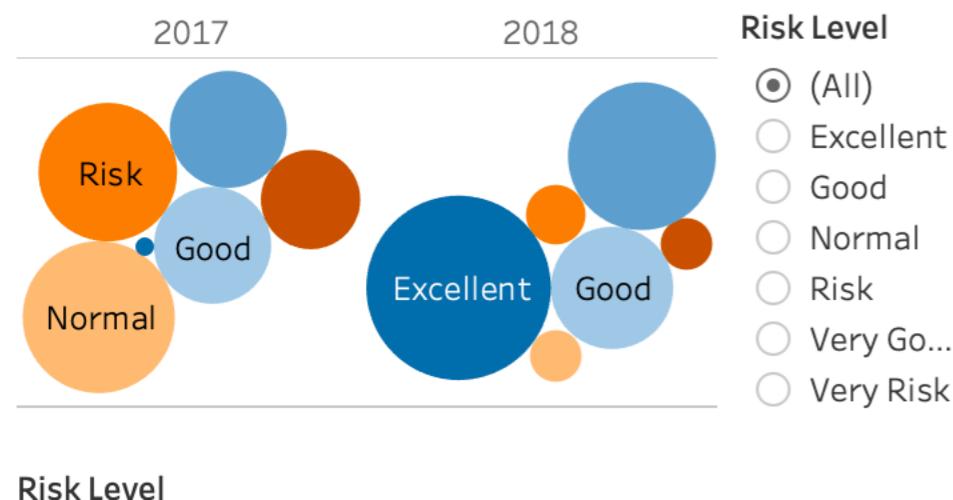
- N
- Y

Age Range

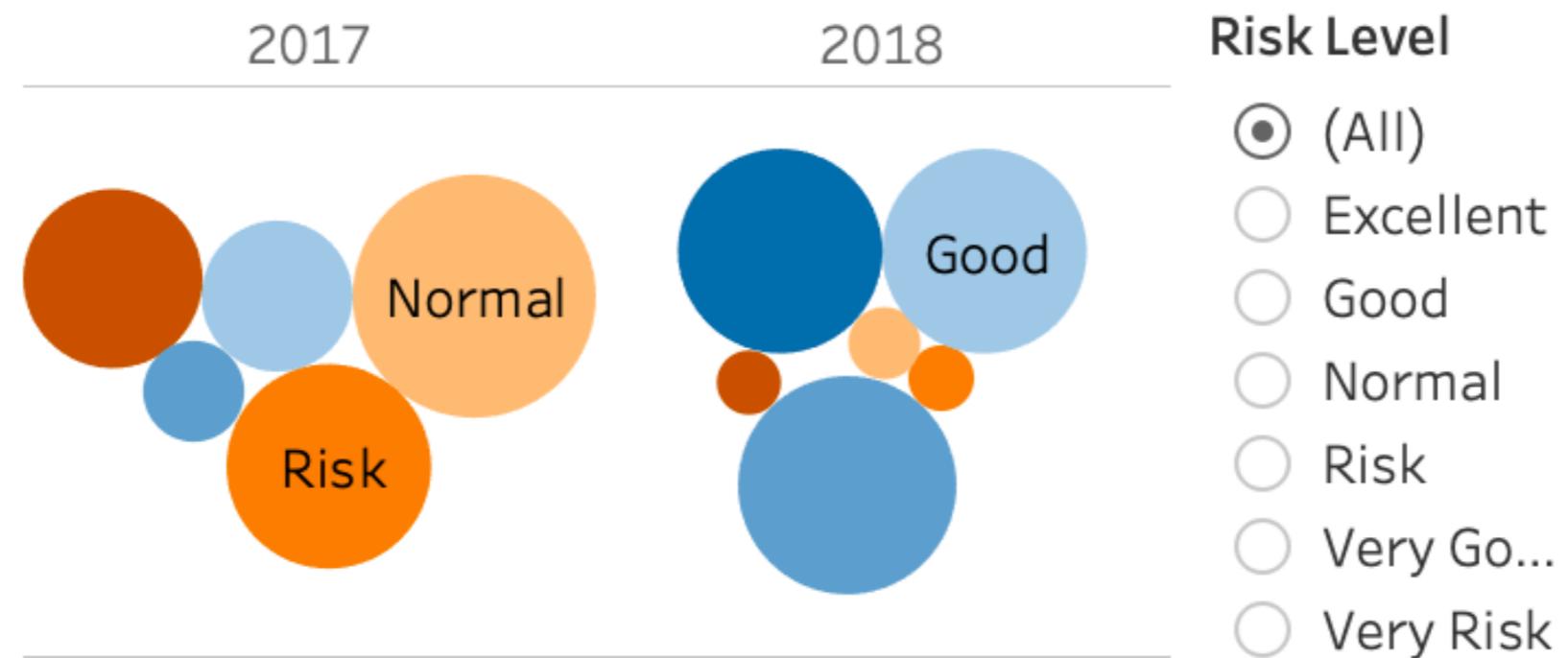
- (All)
- 1-18
- 19-27
- 28-38
- 39-45
- 46-52
- 53+

Annual Range

- (All)
- 1-60,000
- 60,001-88,000
- 88,001-130,0000
- 130,000-190,000
- 190,001-300,0000
- 300,001+



Overall A1 (Yes)

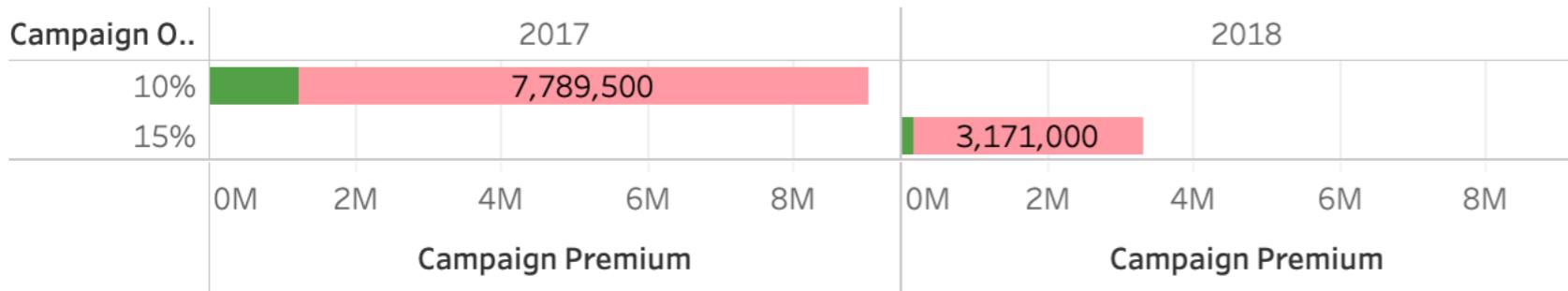


A1

Aged: 53+

Annual Premium: 88,001-130,0000

Campaign Premium 17/18



Y - 2018

4.77%

Y - 2017

13.59%

Campaign Take Up

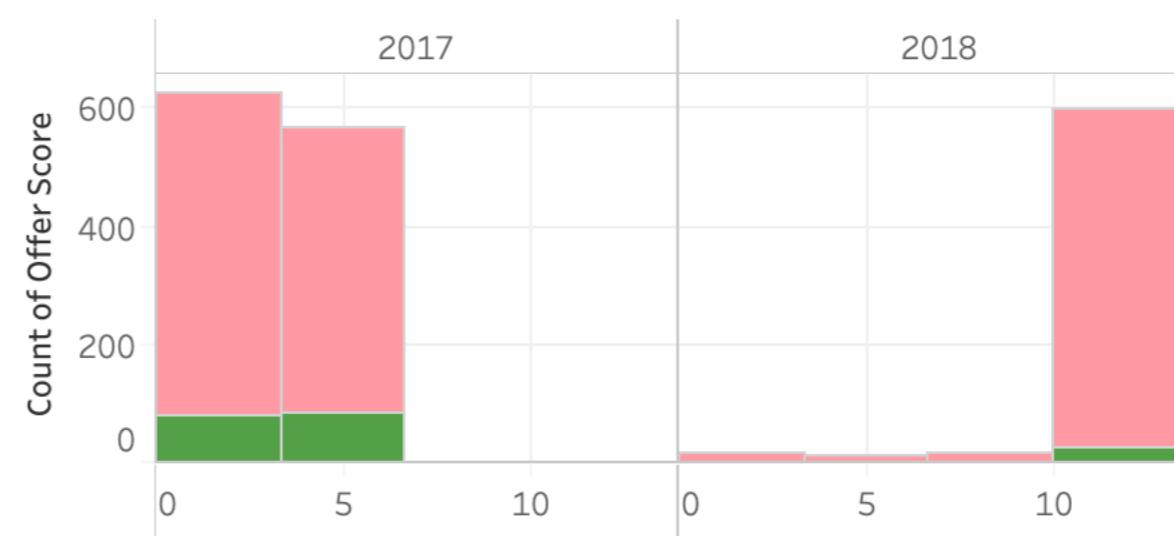
- N
- Y

Age Range

- (All)
- 1-18
- 19-27
- 28-38
- 39-45
- 46-52
- 53+

Annual Range

- (All)
- 1-60,000
- 60,001-88,000
- 88,001-130,0000
- 130,000-190,000
- 190,001-300,0000
- 300,001+

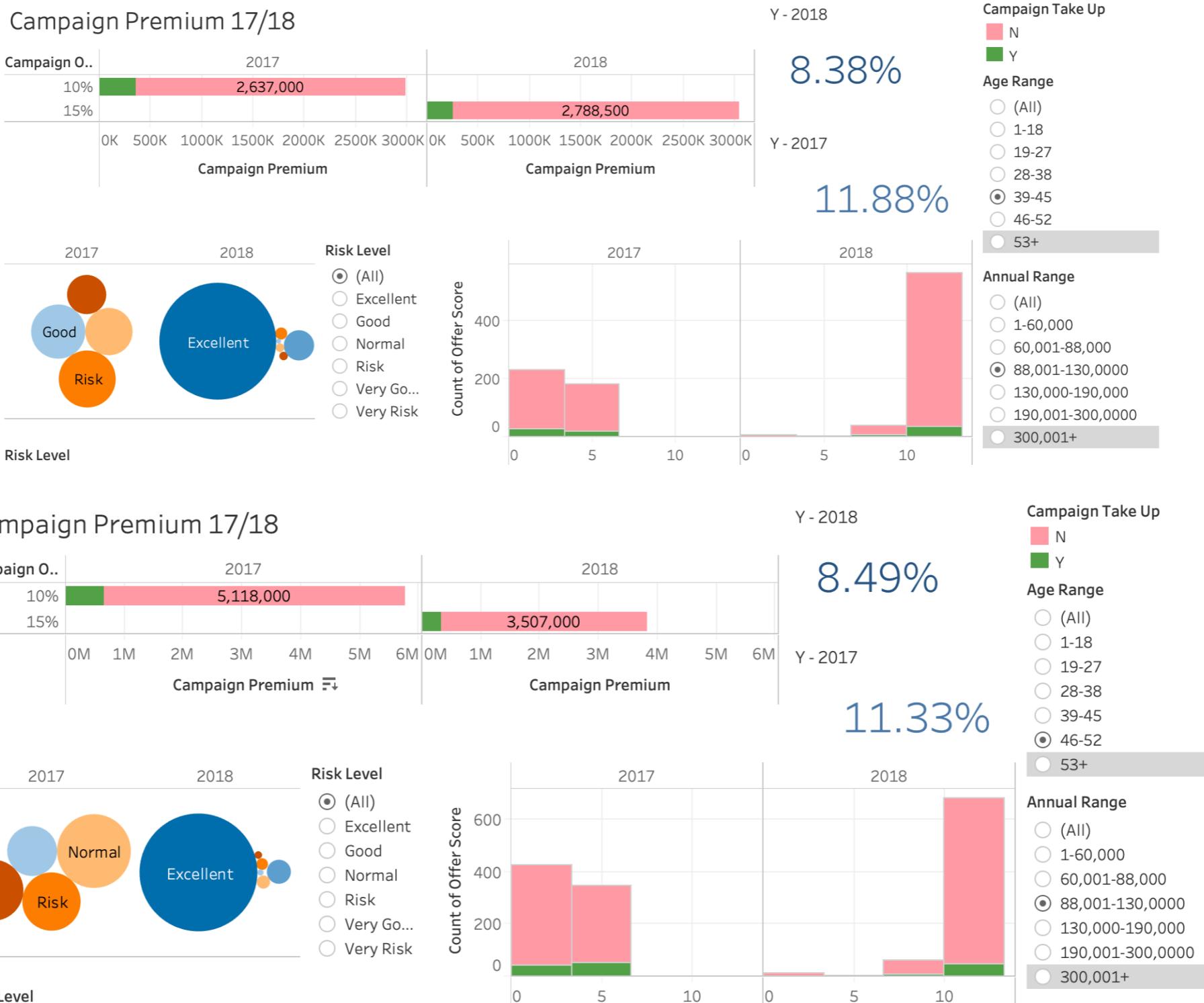


Customer Gender

A1

Aged: 39-45, 46-52

88,001-130,0000

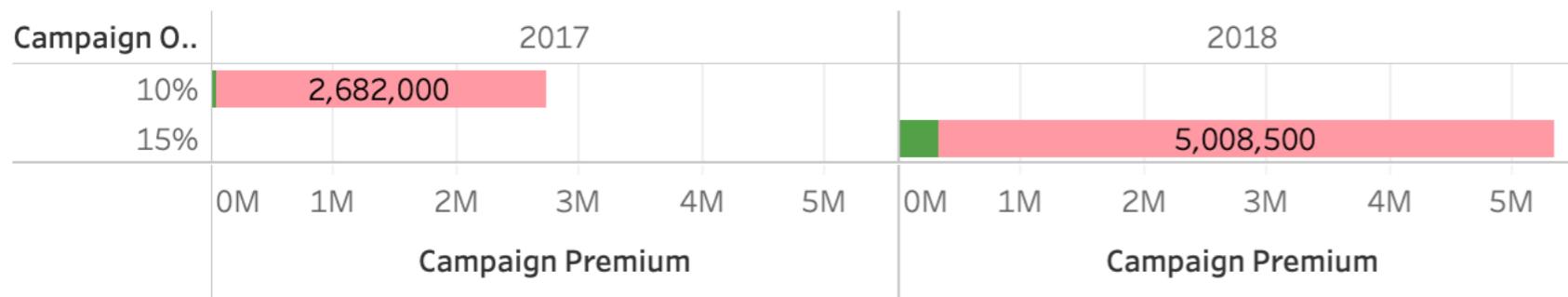


A1

Aged: 53+

Annual Premium: 300,001+

Campaign Premium 17/18



Y - 2018

6.16%

Y - 2017

1.81%

Campaign Take Up

- N
- Y

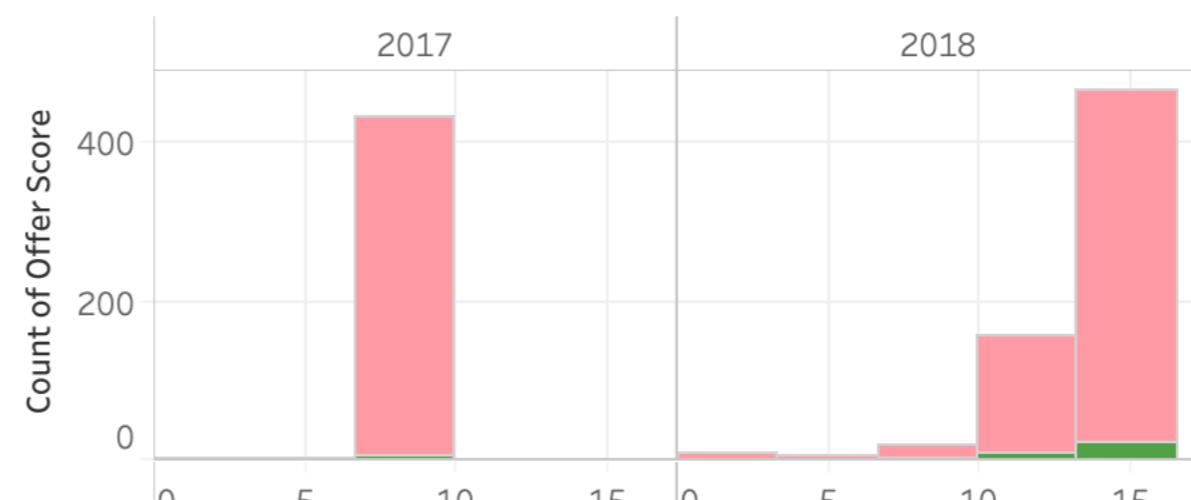
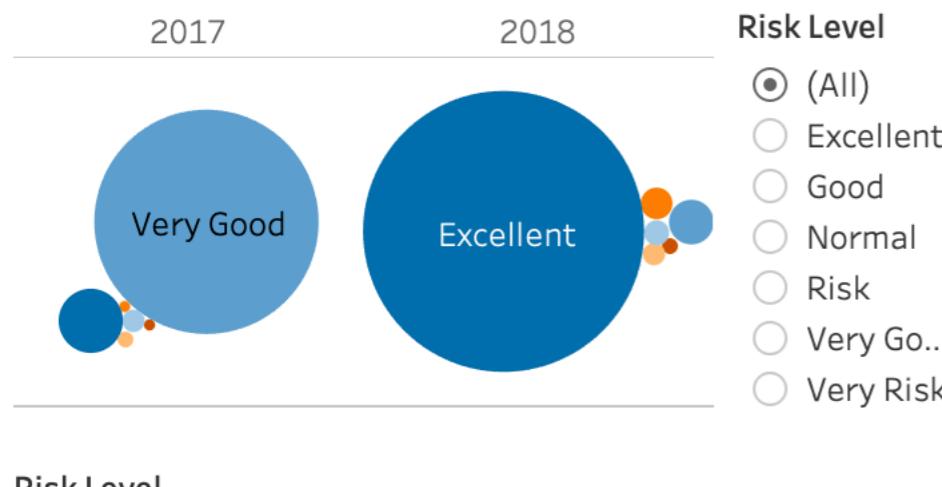
Age Range

- (All)
- 1-18
- 19-27
- 28-38
- 39-45
- 46-52

- 53+

Annual Range

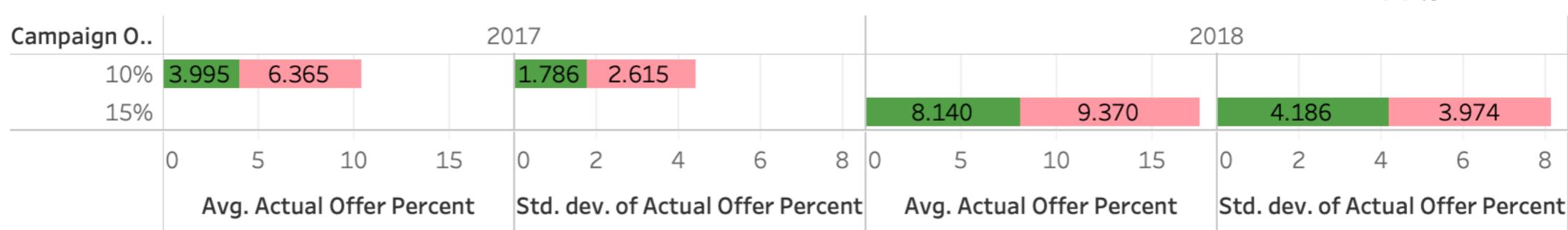
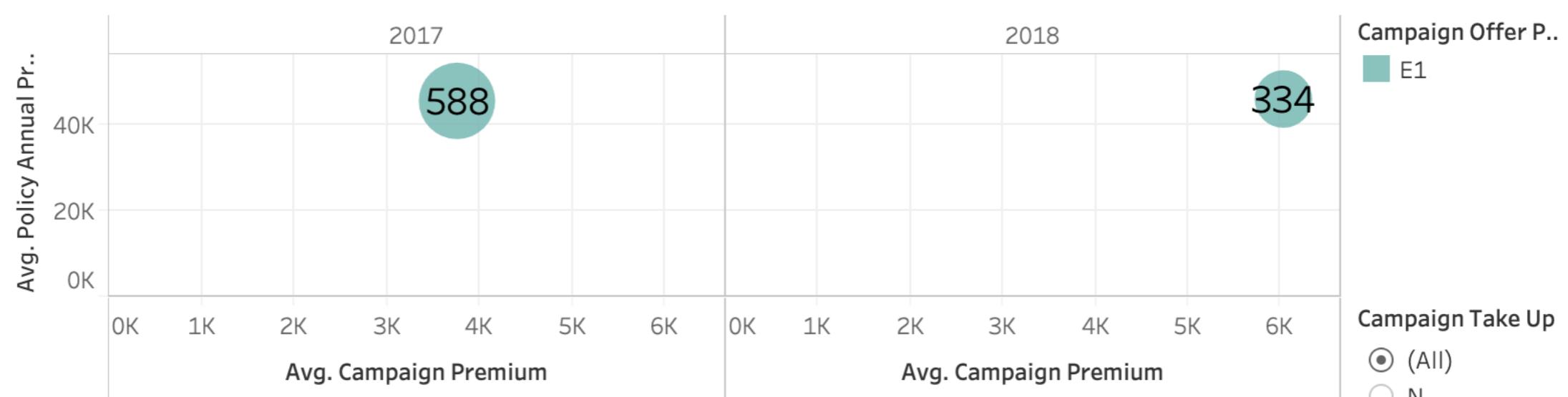
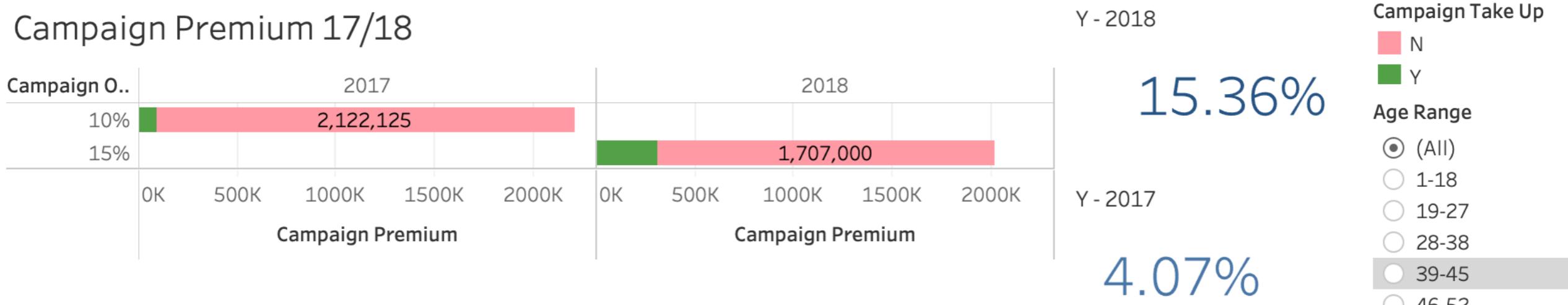
- (All)
- 1-60,000
- 60,001-88,000
- 88,001-130,0000
- 130,000-190,000
- 190,001-300,0000
- 300,001+



E1

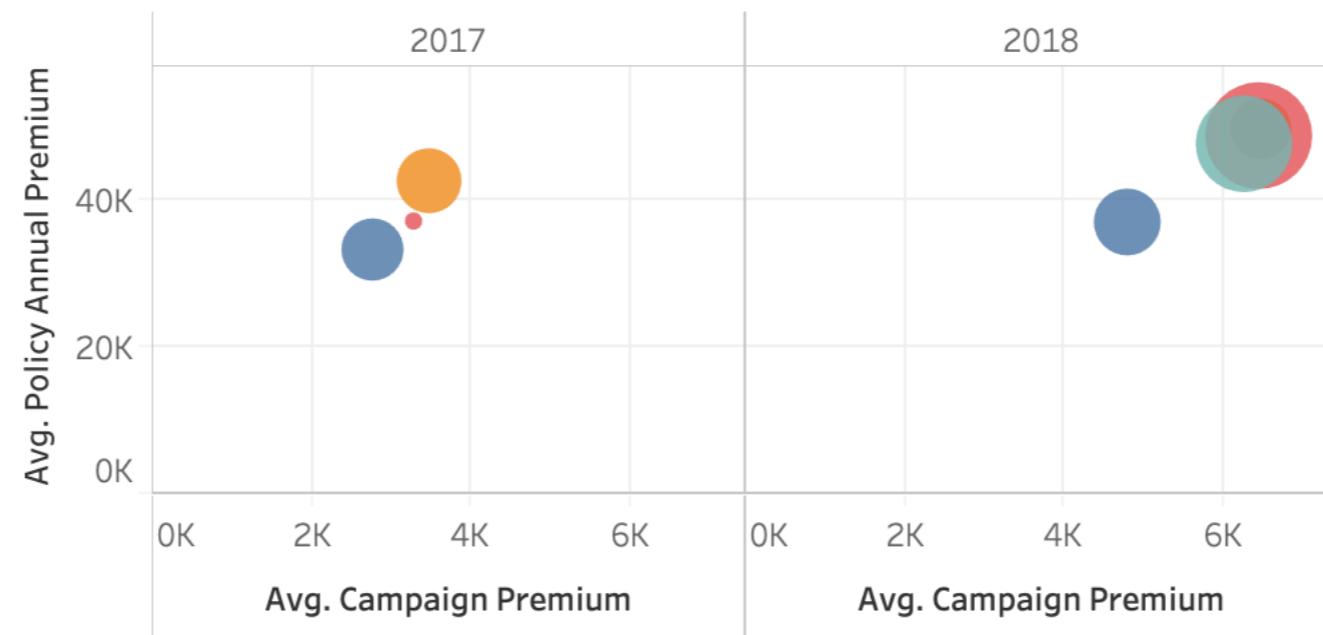
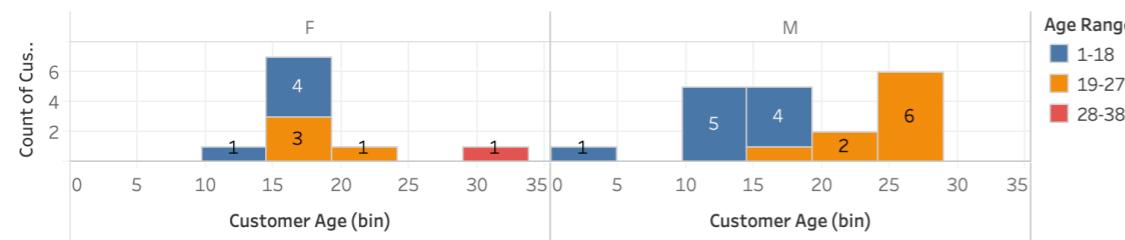
Annual Premium: 1-60,000

Risk



E1

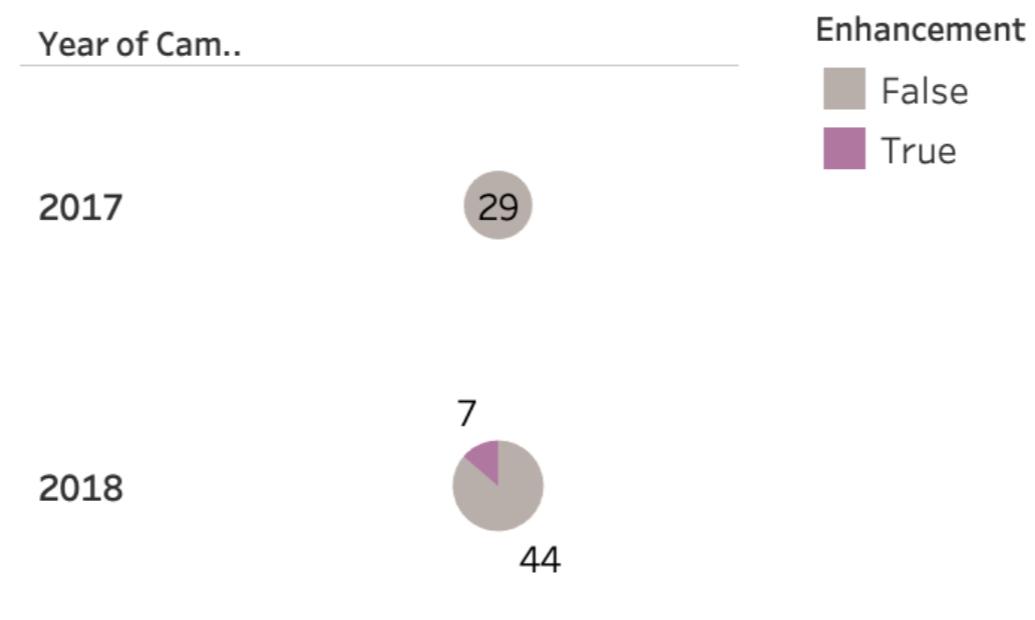
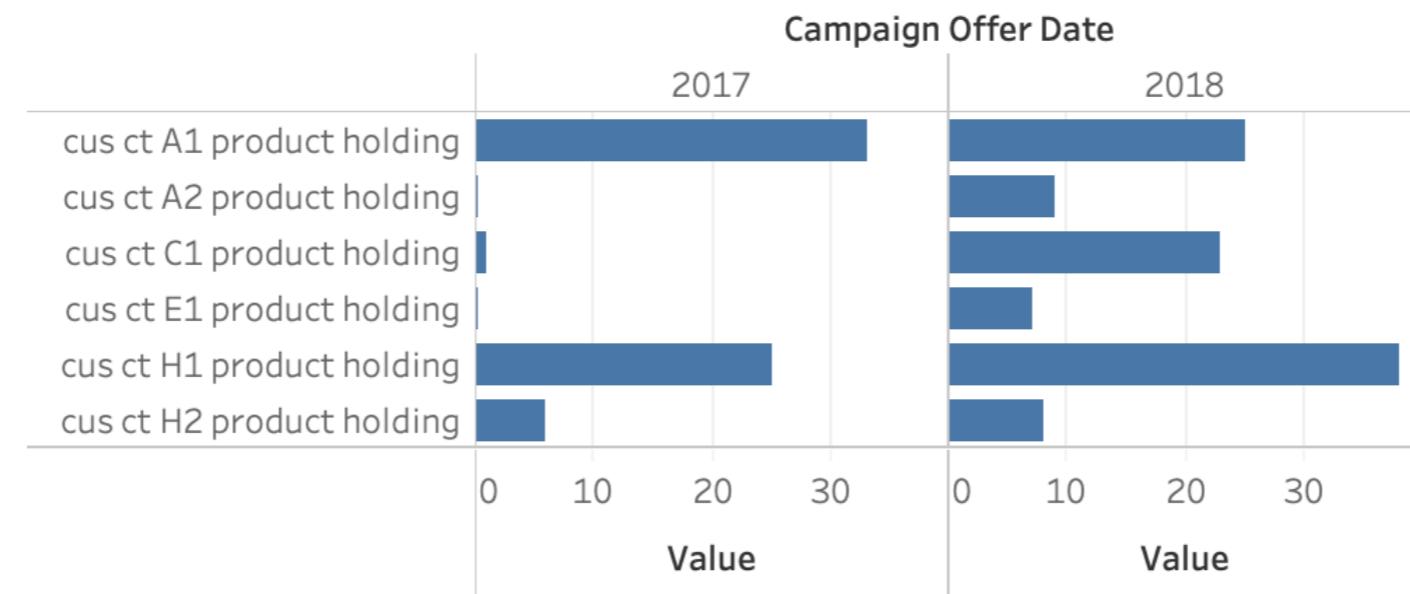
Annual Premium: 1-60,000 Risk (Yes)

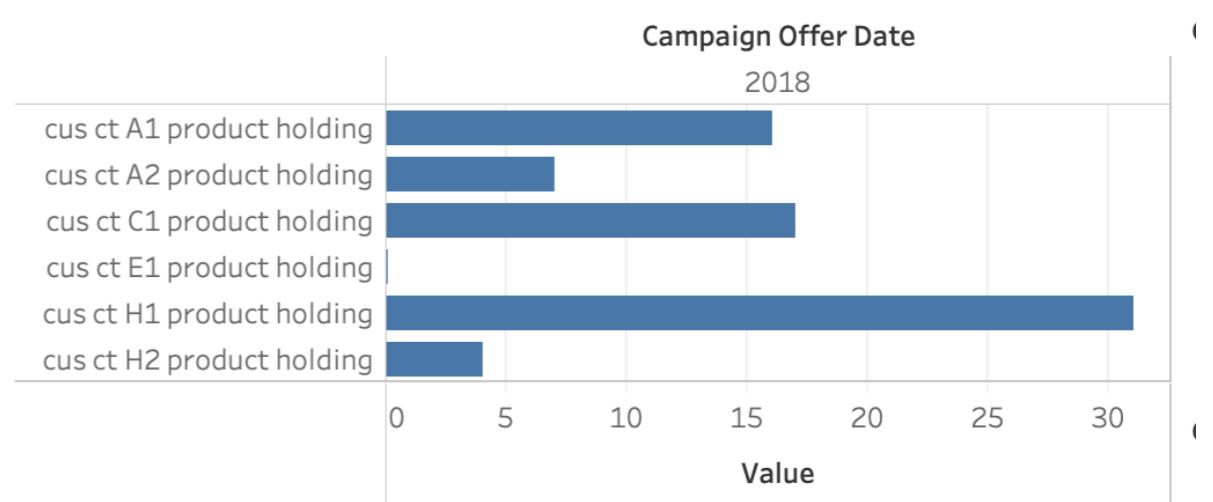
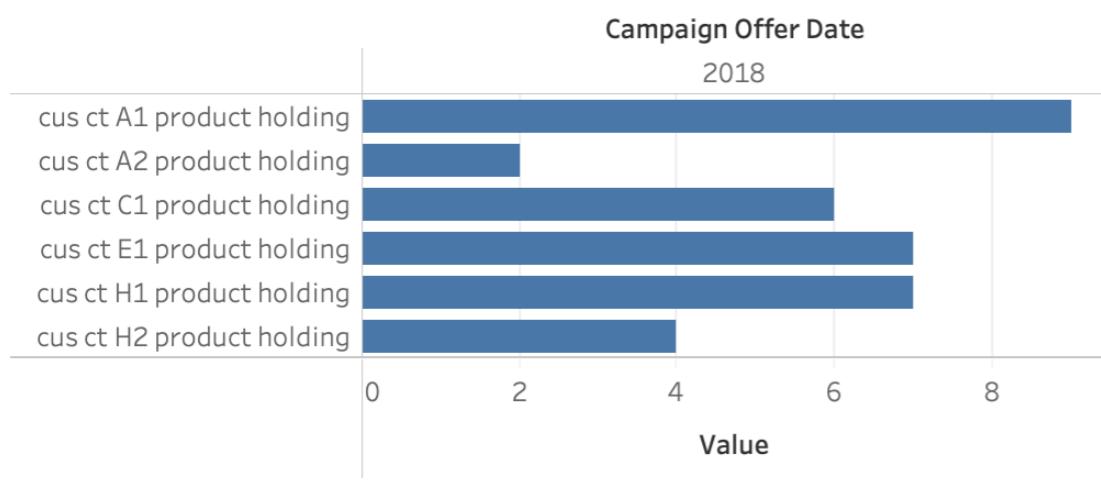
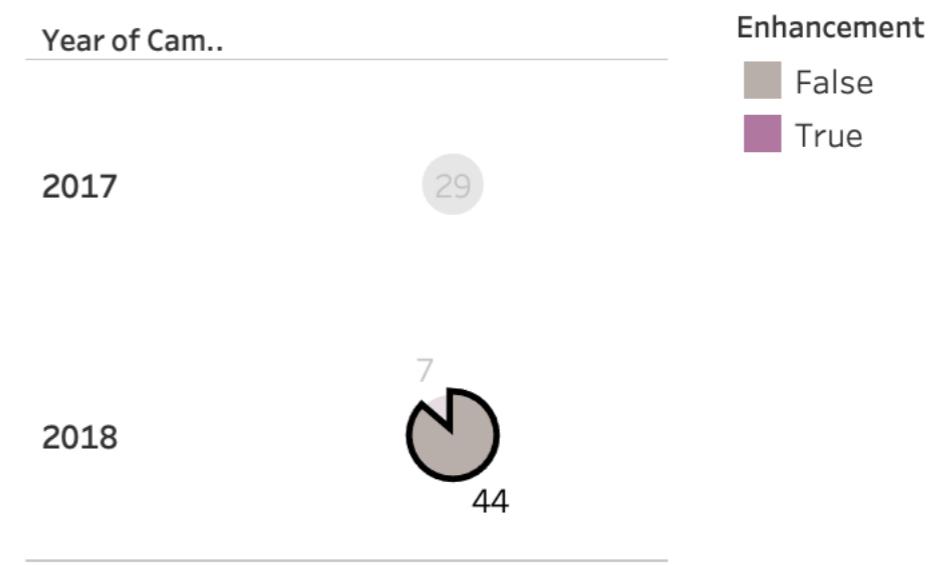
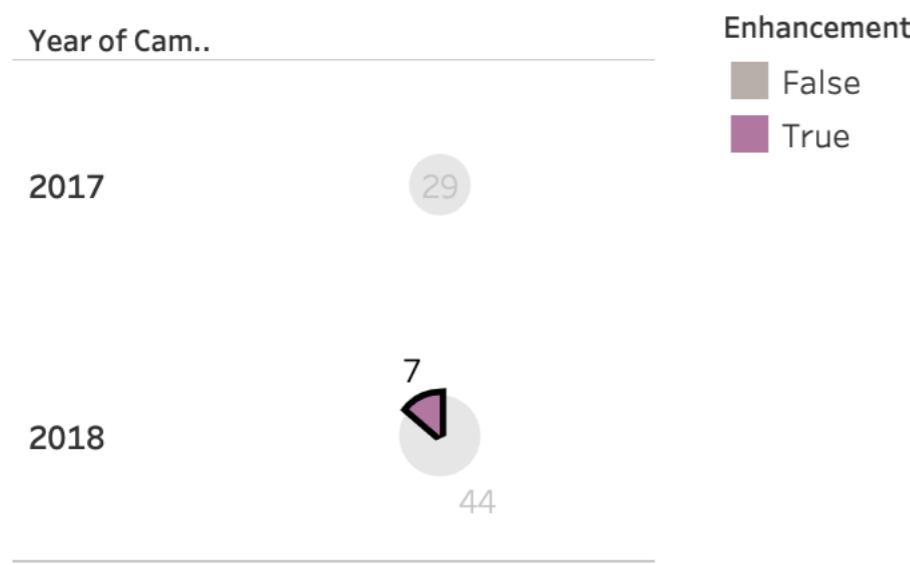


E1

Annual Premium: 1-60,000

Risk (Yes)





	age_range	count	unique	top	freq	true_prob
0	1-18	77	2	True	71	0.92
1	19-27	86	2	True	78	0.91
2	28-38	67	2	True	59	0.88
3	39-45	75	2	True	60	0.8
4	46-52	82	2	True	65	0.79
5	53+	100	2	True	73	0.73
6	None	387	2	True	336	0.87

	age_range	count	mean	std	min	25%	50%	75%	max
0	1-18	77.0	1.885194805194805	2.8796027734054293	-6.18	0.41	2.35	3.81	7.51
1	19-27	86.0	0.9626744186046512	3.7367051936852556	-9.2	-1.5074999999999998	1.295	3.1475	8.56
2	28-38	67.0	2.243880597014925	2.905144838210559	-5.59	1.155	2.78	3.975	9.59
3	39-45	75.0	-0.264	3.4746261708314794	-10.46	-2.64	0.5	2.16	8.5
4	46-52	82.0	-0.30512195121951224	4.4624494308861244	-14.46	-1.9425000000000001	0.69	2.04	10.0
5	53+	100.0	-2.1454000000000004	4.2702273068919006	-14.12	-3.7300000000000004	-1.33	0.4525	5.16
6	None	387.0	0.8390956072351415	3.803569970007428	-11.22	-1.21	1.16	3.014999999999997	11.29

	annual_range	count	unique	top	freq	true_prob
0	1-60,000	77	2	True	74	0.96
1	130,000-190,000	99	2	True	91	0.92
2	190,001-300,0000	74	2	True	59	0.8
3	300,001+	53	2	True	47	0.89
4	60,001-88,000	98	2	True	93	0.95
5	88,001-130,0000	105	2	True	93	0.89
6	None	368	2	True	285	0.77

	annual_range	count	mean	std	min	25%	50%	75%	max
0	1-60,000	77.0	-1.5398701298701298	6.25831604505189	-14.46	-6.31	-0.59	2.92	11.29
1	130,000-190,000	99.0	1.2450505050505047	3.0913029330613693	-5.74	-0.99	1.66	3.4400000000000004	7.9
2	190,001-300,0000	74.0	1.0485135135135133	2.5067895106091007	-5.4	-0.66	1.245	2.61	6.8
3	300,001+	53.0	2.519811320754717	1.8835436024093175	-2.22	1.39	2.58	3.34	7.05
4	60,001-88,000	98.0	-1.2944897959183674	4.740932989749683	-12.08	-4.4425	-1.82	1.6974999999999998	10.78
5	88,001-130,0000	105.0	-0.38752380952380944	3.499185009770237	-8.99	-2.48	-0.76	1.76	10.28
6	None	368.0	1.0744021739130434	3.4379110429413124	-10.36	-0.5575	1.455	3.1325000000000003	11.01

	cust_gender	count	unique	top	freq	true_prob
0	F	197	2	True	166	0.84
1	M	292	2	True	249	0.85
2	None	385	2	True	327	0.85

	cust_gender	count	mean	std	min	25%	50%	75%	max
0	F	197.0	1.2458883248730965	3.864946054975826	-13.73	-0.46	2.04	3.51	10.78
1	M	292.0	0.261746575342466	3.6667839449753683	-13.08	-1.6649999999999998	0.87	2.5475	10.0
2	None	385.0	0.31633766233766253	4.114773477495923	-14.46	-1.93	0.87	2.78	11.29

	cus_marital_status	count	unique	top	freq	true_prob
0	00 NA	129	2	True	108	0.84
1	01 Single	158	2	True	137	0.87
2	02 Maried	128	2	True	104	0.81
3	03 Widow	1	1	True	1	1.0
4	None	458	2	True	392	0.86

	cus_marital_status	count	mean	std	min	25%	50%	75%	max
0	00 NA	129.0	0.5994573643410853	3.7345720784978997	-11.67	-0.67	1.32	2.66	10.66
1	01 Single	158.0	1.8472151898734182	3.2460515698557075	-8.58	0.5975	2.3049999999999997	3.4725	11.01
2	02 Maried	128.0	-0.509765625	3.879720434940802	-13.08	-2.3325	0.1050000000000001	2.0875	6.86
3	03 Widow	1.0	4.11	nan	4.11	4.11	4.11	4.11	4.11
4	None	458.0	0.2960917030567686	4.099268575455452	-14.46	-1.9575	0.6950000000000001	2.87	11.29

risk_level	count	unique	top	freq	true_prob
Good	87	2	True	82	0.94
None	420	2	True	314	0.75
Normal	108	2	True	103	0.95
Risk	98	2	True	94	0.96
Very Good	76	2	True	73	0.96
Very Risk	85	2	True	76	0.89

Good
(offer score = 4.46 - 6.63)

risk_level	count	mean	std	min	25%	50%	75%	max
Good	87.0	2.0759770114942526	3.5355692478640734	-8.99	0.03	2.67	4.279999999999999	11.01
None	420.0	0.1949999999999995	4.164182511664619	-13.73	-2.0825	0.765	2.875	10.78
Normal	108.0	0.7585185185185184	3.114708493527743	-7.18	-1.0725	0.935	2.63	9.59
Risk	98.0	1.0080612244897962	3.2303910133768174	-8.13	-1.065	1.27	2.7025	11.29
Very Good	76.0	0.7064473684210529	3.325397902586443	-8.15	-1.12	1.0750000000000002	2.9975	10.0
Very Risk	85.0	-0.6264705882352941	4.7083013583109	-14.46	-2.43	1.15	2.37	6.63

Hypothesis Testing - 2

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 \neq \mu_2$$

Null Hypothesis: Average Actual Offer Percent in 2018 (15%) is equal to Average Actual Offer Percent in 2017 (10%)

Alternative Hypothesis: Average Actual Offer Percent in 2018 (15%) is not to Average Actual Offer Percent in 2017 (10%)

Level 3 - Criteria

Total of 874 Criteria

Average Actual Offer Percent in 2018 (15%) of **806** criteria is significantly not to Average Actual Offer Percent in 2017 (10%)

While Actual Offer Percent in 2018 (15%) of **68** criteria is significantly equal to Average Actual Offer Percent in 2017 (10%)

$$806 * 100 / 874 = 92.21\%$$

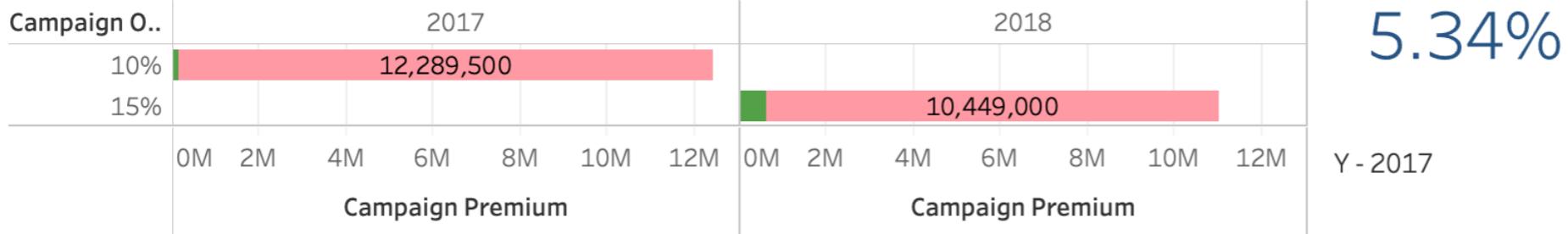
group	sample_2018_no	sample_2017_no	y_2018	y_2017	y_score	greater_p_value	two_sided_p_value	premium_2018_Mean	premium_2017_Mean
28-38_02 Maried_88,001-130,0000	52	19	8.15	3.31	4.84	0.038	0.085	9,832.0	8,605.0
1-18_00 NA_A1	65	20	5.34	1.09	4.25	0.035	0.814	9,069.0	6,750.0
M_01 Single_300,001+	97	36	4.42	1.46	2.96	0.008	0.184	28,555.0	19,643.0
F_300,001+_A1	73	22	4.21	1.29	2.93	0.023	0.181	18,616.0	13,909.0
19-27_F_00 NA	122	57	7.06	4.31	2.75	0.012	0.18	9,604.0	7,115.0
01 Single_300,001+_A1	69	26	4.34	1.59	2.74	0.02	0.111	21,587.0	16,442.0
00 NA_300,001+_A1	44	16	3.83	1.22	2.61	0.018	0.207	19,023.0	12,094.0
M_02 Maried_300,001+	104	42	4.36	1.78	2.58	0.002	0.06	39,154.0	28,033.0
M_300,001+_A1	75	29	4.14	1.6	2.54	0.026	0.209	17,700.0	12,724.0
19-27_00 NA_300,001+	36	24	6.5	4.01	2.49	0.035	0.081	17,991.0	12,597.0
1-18_F_300,001+	33	18	3.47	1.34	2.13	0.045	0.493	15,617.0	11,942.0
19-27_60,001-88,000_E1	163	139	13.49	11.57	1.93	0.015	0.071	3,258.0	2,820.0

Aged 1-18

NA

A1

Campaign Premium 17/18

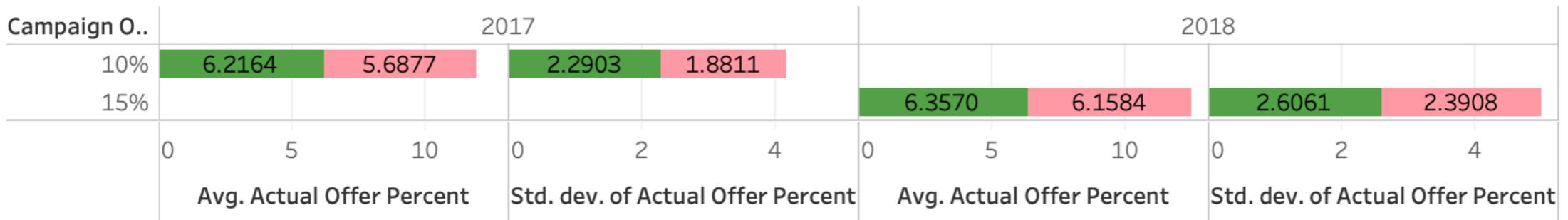
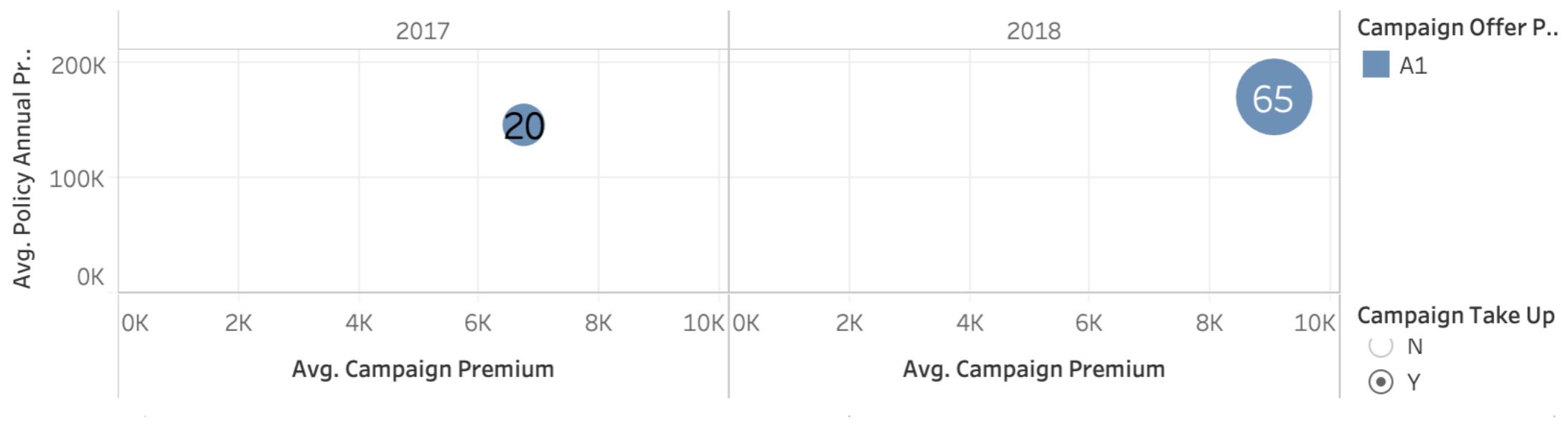


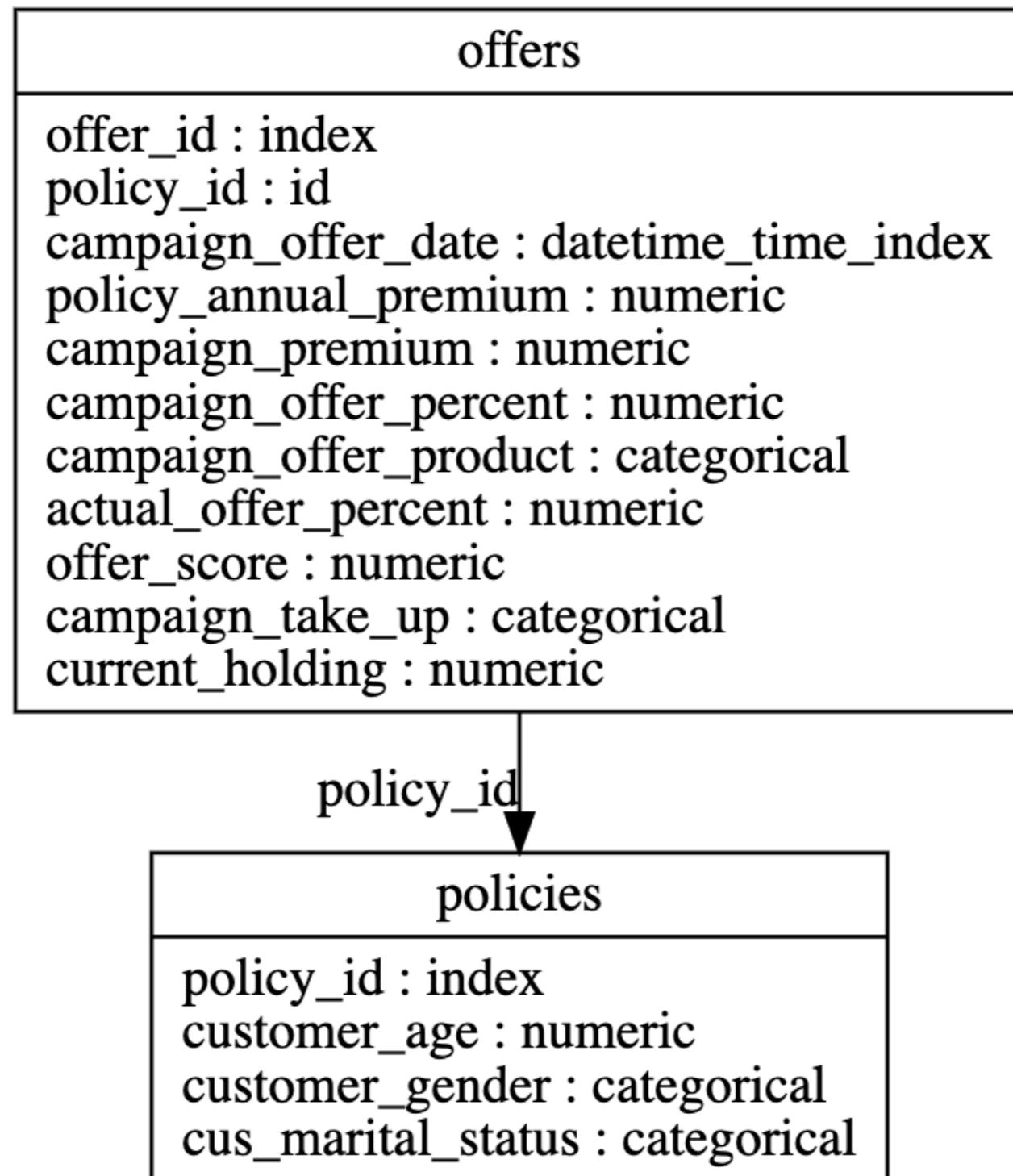
Campaign Take Up

- N (Red)
- Y (Green)

Age Range

- (All) (White)
- 1-18 (Dark Blue)
- 19-27 (Light Blue)
- 28-38 (Yellow)
- 39-45 (Orange)
- 46-52 (Red)





```
feature_matrix_policy, features_defs = ft.dfs(entities=es, entityset=es,
                                             agg_primitives=['max','median','trend','avg_time_between',\
                                              'min','std','mean','sum','skew',\
                                              'count','mode','last','time_since_first']
```

	name	type	description
0	std	aggregation	Computes the dispersion relative to the mean v...
1	num_unique	aggregation	Determines the number of distinct values, igno...
2	time_since_first	aggregation	Calculates the time elapsed since the first da...
3	sum	aggregation	Calculates the total addition, ignoring `NaN`.
4	skew	aggregation	Computes the extent to which a distribution di...
5	max	aggregation	Calculates the highest value, ignoring `NaN` v...
6	mean	aggregation	Computes the average for a list of values.
7	avg_time_between	aggregation	Computes the average number of seconds between...
8	time_since_last	aggregation	Calculates the time elapsed since the last dat...
9	median	aggregation	Determines the middlemost number in a list of ...
10	min	aggregation	Calculates the smallest value, ignoring `NaN` ...
11	all	aggregation	Calculates if all values are 'True' in a list.
12	n_most_common	aggregation	Determines the `n` most common elements.
13	mode	aggregation	Determines the most commonly repeated value.
14	any	aggregation	Determines if any value is 'True' in a list.
15	percent_true	aggregation	Determines the percent of 'True` values.
16	count	aggregation	Determines the total number of values, excludi...
17	last	aggregation	Determines the last value in a list.

```
feature_matrix_policy length: 604

policy_id
customer_age
customer_gender
cus_marital_status
MAX(offers.offer_score)
MAX(offers.policy_annual_premium)
MAX(offers.current_holding)
MAX(offers.campaign_premium)
MAX(offers.actual_offer_percent)
MAX(offers.campaign_offer_percent)
MEDIAN(offers.offer_score)
MEDIAN(offers.policy_annual_premium)
MEDIAN(offers.current_holding)
MEDIAN(offers.campaign_premium)
MEDIAN(offers.actual_offer_percent)
MEDIAN(offers.campaign_offer_percent)
TREND(offers.policy_annual_premium, campaign_offer_date)
TREND(offers.current_holding, campaign_offer_date)
TREND(offers.campaign_offer_percent, campaign_offer_date)
TREND(offers.campaign_premium, campaign_offer_date)
TREND(offers.actual_offer_percent, campaign_offer_date)
TREND(offers.offer_score, campaign_offer_date)
AVG_TIME_BETWEEN(offers.campaign_offer_date)
MIN(offers.offer_score)
MIN(offers.policy_annual_premium)
```

```
es["offers"]["campaign_take_up"].interesting_values = ["Y", "N"]
es["offers"]["campaign_offer_product"].interesting_values = ["E1", "A1", "A2", "C1", "H1", "H2"]
```

```
TREND(offers.offer_score, campaign_offer_date WHERE campaign_take_up = N)
TREND(offers.offer_score, campaign_offer_date WHERE campaign_offer_product = E1)
TREND(offers.offer_score, campaign_offer_date WHERE campaign_offer_product = A1)
TREND(offers.offer_score, campaign_offer_date WHERE campaign_offer_product = C1)
AVG_TIME_BETWEEN(offers.campaign_offer_date WHERE campaign_take_up = Y)
AVG_TIME_BETWEEN(offers.campaign_offer_date WHERE campaign_offer_product = H2)
AVG_TIME_BETWEEN(offers.campaign_offer_date WHERE campaign_offer_product = H1)
AVG_TIME_BETWEEN(offers.campaign_offer_date WHERE campaign_offer_product = A2)
AVG_TIME_BETWEEN(offers.campaign_offer_date WHERE campaign_take_up = N)
AVG_TIME_BETWEEN(offers.campaign_offer_date WHERE campaign_offer_product = E1)
AVG_TIME_BETWEEN(offers.campaign_offer_date WHERE campaign_offer_product = A1)
AVG_TIME_BETWEEN(offers.campaign_offer_date WHERE campaign_offer_product = C1)
MIN(offers.offer_score WHERE campaign_take_up = Y)
MIN(offers.offer_score WHERE campaign_offer_product = H2)
MIN(offers.offer_score WHERE campaign_offer_product = H1)
MIN(offers.offer_score WHERE campaign_offer_product = A2)
MIN(offers.offer_score WHERE campaign_take_up = N)
MIN(offers.offer_score WHERE campaign_offer_product = E1)
MIN(offers.offer_score WHERE campaign_offer_product = A1)
```

<https://github.com/thanatchon36/phoenix-enhancement>

thanatchon36 / phoenix-enhancement

Unwatch 1 Star 0 Fork 0

Code Issues 0 Pull requests 0 Actions Projects 0 Wiki Security 0 Insights Settings

No description, website, or topics provided. Edit

Manage topics

6 commits 1 branch 0 packages 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find file Clone or download ▾

thanatchon36 update everything	Latest commit 9caf30b 19 seconds ago
.ipynb_checkpoints	update everything 19 seconds ago
data	add analytic report 11 hours ago
.DS_Store	add analytic report 11 hours ago
~tablue_presentation_1309.twbr	update everything 19 seconds ago
Phoenix Campaign Enhancement.key	update everything 19 seconds ago
README.md	first commit 23 hours ago
automated-feature-engineering.ipynb	update everything 19 seconds ago
hyothesis-testing.ipynb	update everything 19 seconds ago
report-analytics.ipynb	update everything 19 seconds ago
tableau-data.ipynb	update everything 19 seconds ago
tablue_presentation.twb	update everything 19 seconds ago

README.md

phoenix-enhancement

<https://github.com/thanatchon36/phoenix-enhancement>

thanatchon36 / phoenix-enhancement

Unwatch 1 Star 0 Fork 0

Code Issues 0 Pull requests 0 Actions Projects 0 Wiki Security 0 Insights Settings

Branch: master ▾ phoenix-enhancement / data / Create new file Upload files Find file History

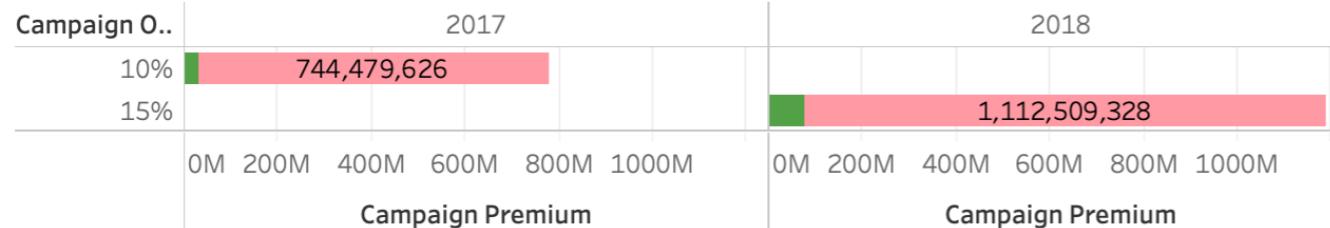
thanatchon36 add analytic report Latest commit 1ed3c2c 11 hours ago

..

📄 .DS_Store	first commit	23 hours ago
📄 Data_Phoenix_Campaign_Enhancement.csv	first commit	23 hours ago
📄 defined_Data_Phoenix_Campaign_Enhancement.csv	first commit	23 hours ago
📄 feature_matrix_policy.csv.zip	first commit	23 hours ago
📄 testReport_level_1.csv	add analytic report	11 hours ago
📄 testReport_level_2.csv	add analytic report	11 hours ago
📄 testReport_level_3.csv	add analytic report	11 hours ago
📄 testReport_level_4.csv	add analytic report	11 hours ago
📄 testReport_level_all.csv	add analytic report	11 hours ago

Q&A / Live Demo

Campaign Premium 17/18

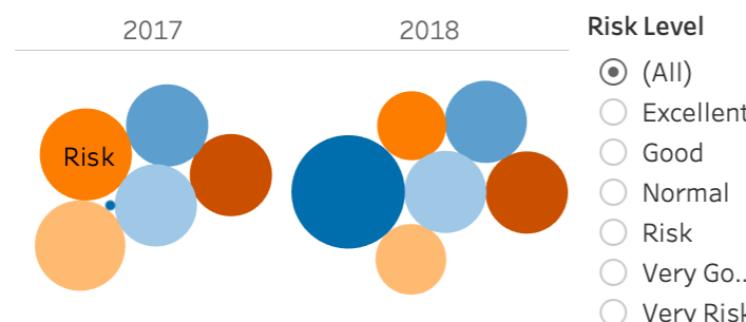


Y - 2018

6.37%

Y - 2017

4.25%



Risk Level
 ● (All)
 ○ Excellent
 ○ Good
 ○ Normal
 ○ Risk
 ○ Very Good...
 ○ Very Risk



Campaign Take Up

N
Y

Age Range

(All)
 1-18
 19-27
 28-38
 39-45
 46-52
 53+

Annual Range

(All)
 1-60,000
 60,001-88,000
 88,001-130,000
 130,000-190,000
 190,001-300,000
 300,001+

Customer Gender

(All)
 F
 M

Cus Marital Status

(All)
 00 NA
 01 Single
 02 Married
 03 Widow

Campaign Offer P..

A1
A2
C1
E1
H1
H2

Campaign Take Up

(All)
 N

Campaign Offer Product

(All)
 A1
 A2
 C1
 E1

