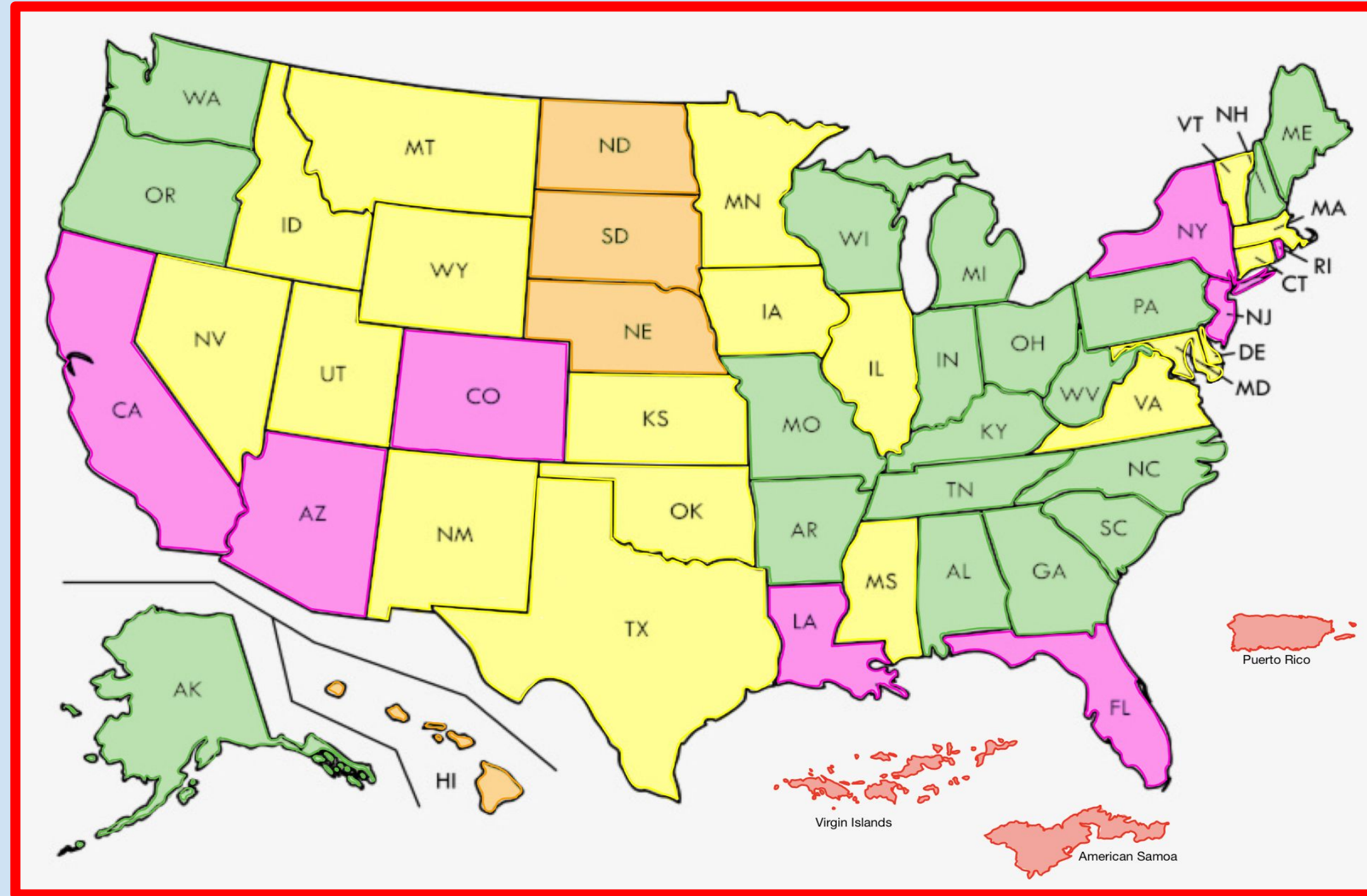


Purpose of Experiment:

In the US, mosquito-borne outbreaks (West Nile virus, Dengue, Chikungunya, and Zika) have occurred frequently in the last 7 years. We wanted to find if climate (temperature) plays a role in these outbreaks and if proper control measures have been able to reduce the number of incidents over the years.

Hypothesis:

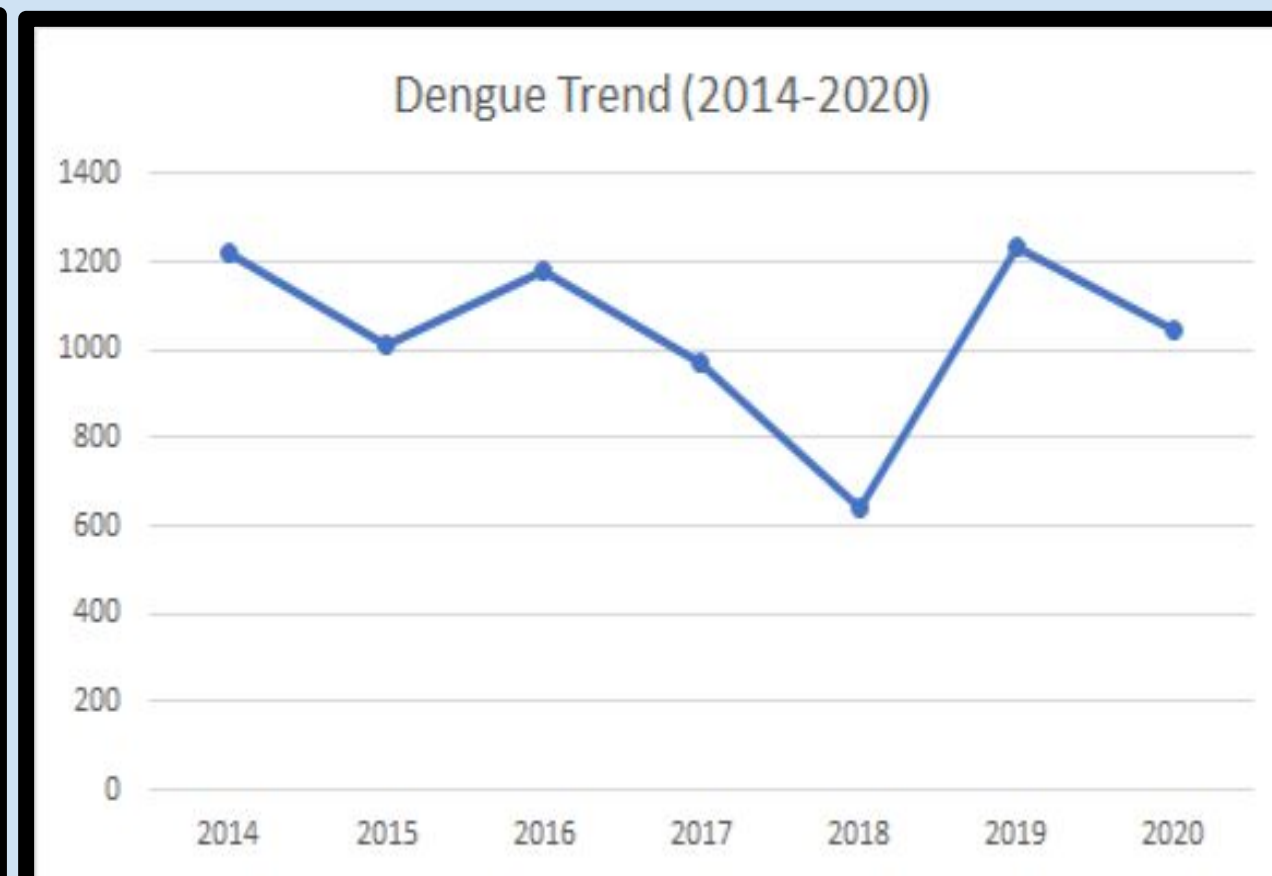
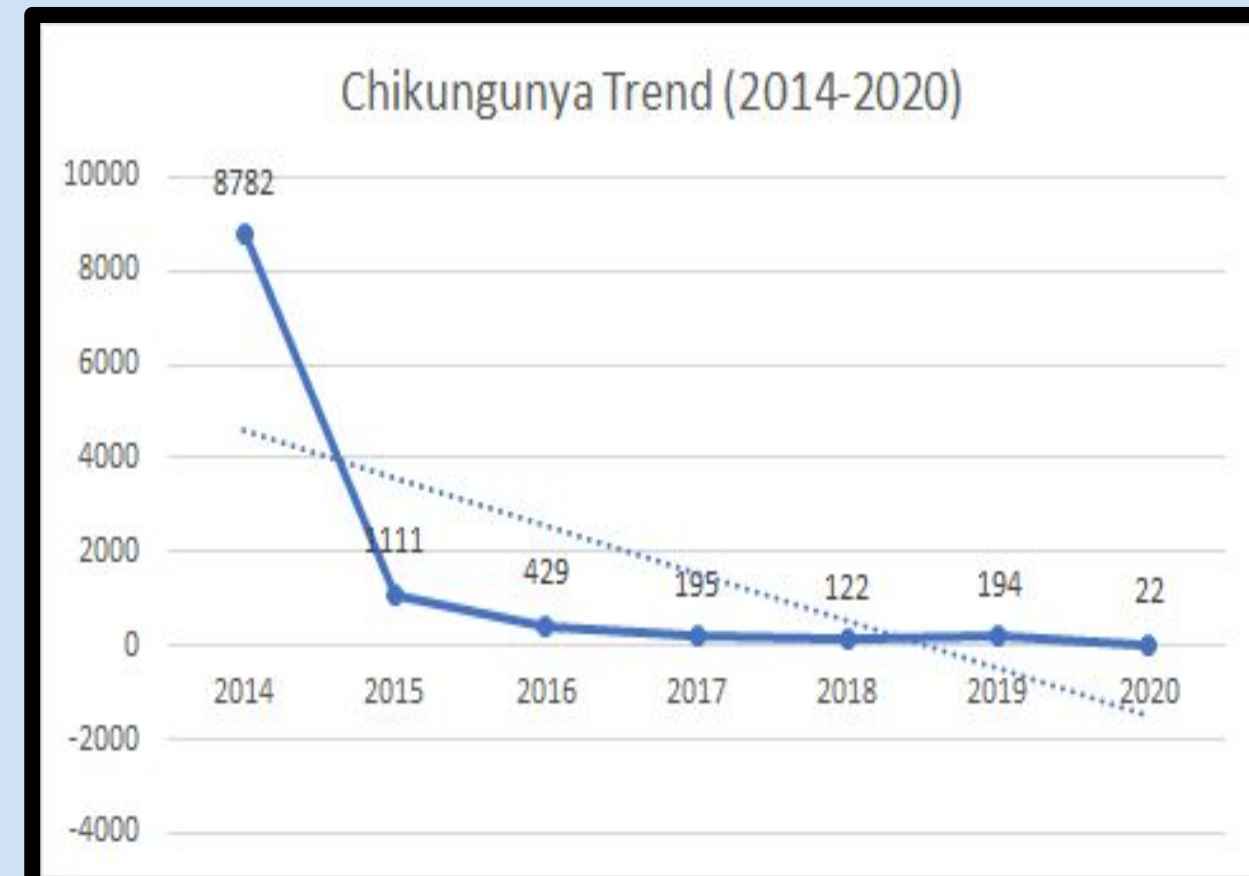
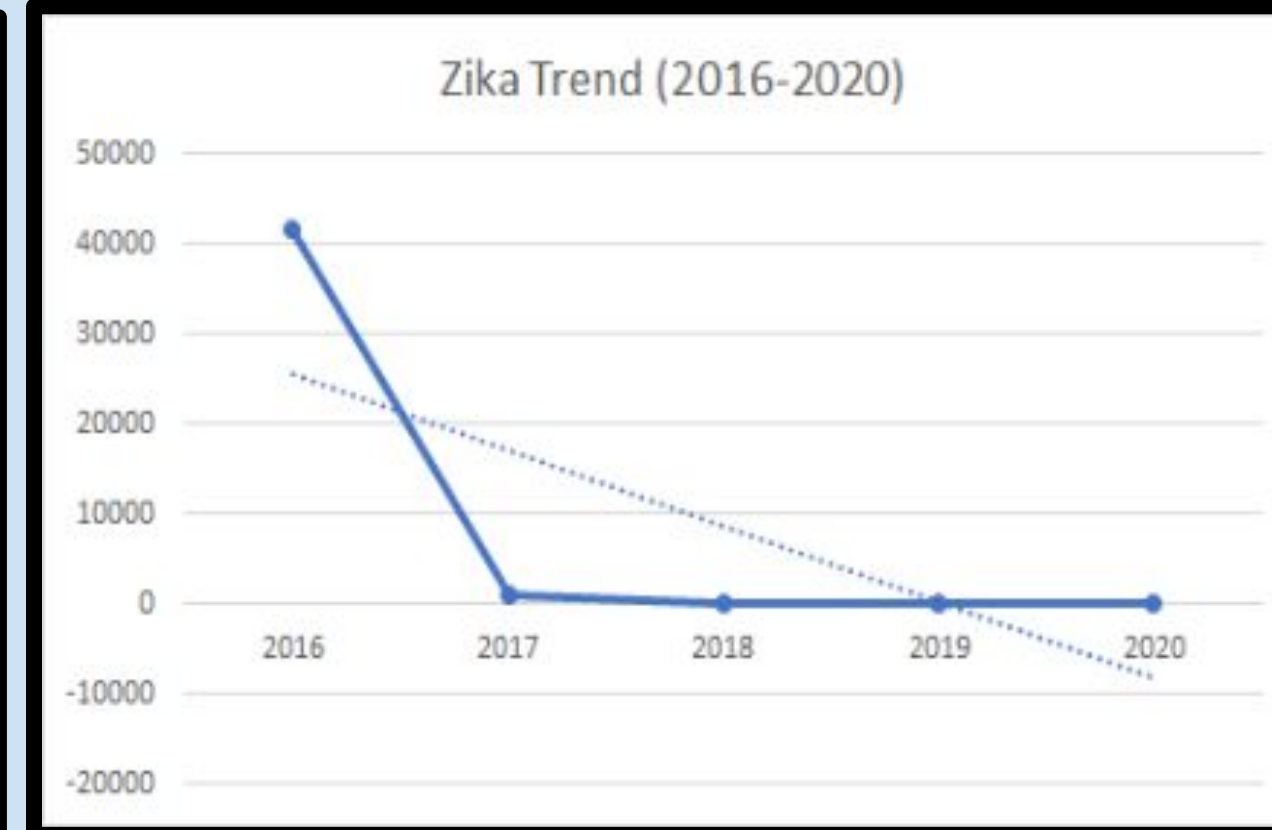
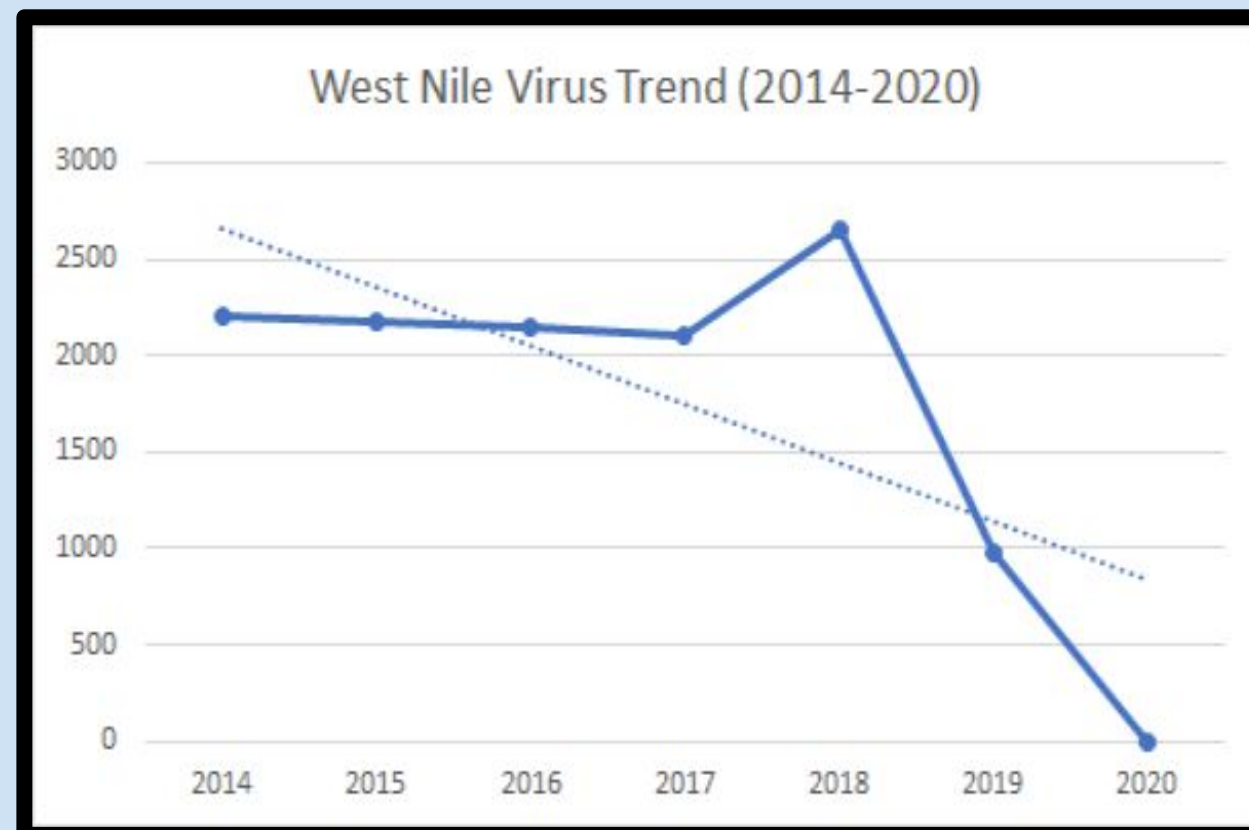
1. Southern States have more mosquito-borne cases than the Northern states due to warmer temperatures.
2. The number of mosquito-borne cases have decreased over the years.



Mosquito-borne Cases Per Million: 1,000+ (Red), 200-999 (Orange), 100-199 (Pink), 50-99 (Yellow), 1-50 (Green)

Distribution of Mosquito-borne diseases in US : Southern states show greater prevalence than Northern states probably due to warmer temperatures

Trend for specific mosquito-borne diseases over 7 years



West Nile Virus, Zika, Chikungunya, all 3 show decrease in trend in the mosquito-borne disease cases. Dengue shows no trend at all.

Data Collection:

1. We used mosquito-borne disease data from the 2 websites : CDC and Statista: www.cdc.gov and www.statista.com
2. We used Google sheets to analyze and make graphs to present data.
3. We calculated the number of **cases per million** based on the population of the States (population data obtained from www.infoplease.com/us/states/state-population-by-rank)
4. We used regression lines to show the trend for the 4 diseases over the last 7 years.

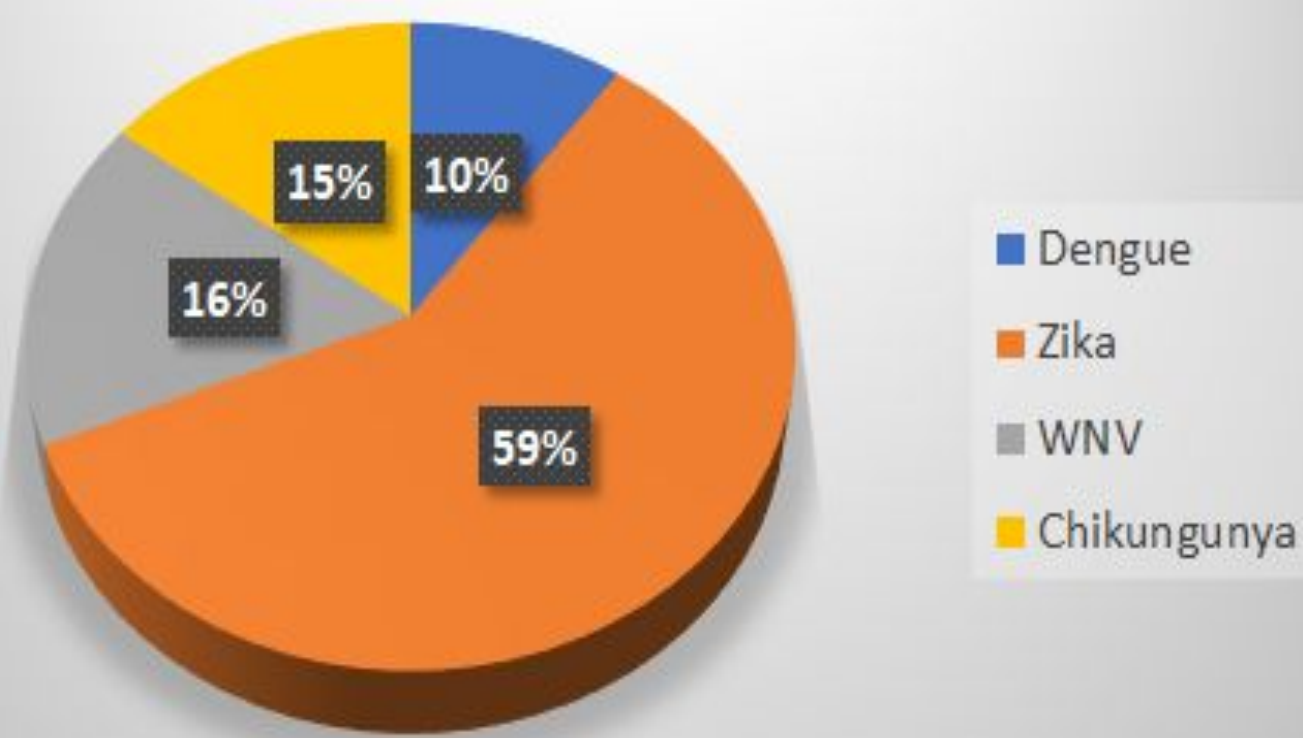
	2014	2015	2016	2017	2018	2019	2020	Total Cases	Population	Cases per 1,000,000
Alabama	3	3	5	0	3	3	0	17	4,880,640	3.48
Alaska	4	1	5	1	3	0	0	14	737,207	18.99
Arizona	97	17	13	3	10	17	0	157	7,062,287	22.23
Arkansas	4	1	3	0	2	2	1	13	3,001,118	4.33
California	130	138	197	130	107	216	49	967	39,174,446	24.68
Colorado	10	13	21	5	9	28	4	90	5,604,513	16.06
Connecticut	3	5	6	6	6	1	0	27	3,576,714	7.55
Delaware	1	1	2	1	0	4	1	10	959,084	10.43
Florida	84	82	68	17	89	387	100	827	20,879,659	39.61
Georgia	4	8	20	5	7	4	1	49	10,405,351	4.71
Hawaii	10	219	56	22	12	14	5	338	1,419,815	238.06
Idaho	1	3	4	0	0	2	1	11	1,722,367	6.39
Illinois	7	29	35	23	13	42	7	156	12,760,787	12.22
Indiana	5	0	9	3	2	14	2	35	6,670,267	5.25
Iowa	4	4	11	5	5	6	1	36	3,140,455	11.46
Kansas	1	4	4	2	3	3	0	17	2,910,805	5.84
Kentucky	1	1	1	0	3	0	0	6	4,450,840	1.35
Louisiana	3	4	6	1	2	5	3	24	4,662,287	5.15
Maine	1	4	2	0	3	1	0	11	1,337,777	8.22
Maryland	8	13	13	9	4	13	0	60	6,019,529	9.97
Massachusetts	17	8	8	5	2	10	9	59	6,846,766	8.62
Michigan	5	16	16	10	8	17	1	73	9,962,289	7.33
Minnesota	3	21	29	11	13	0	0	77	5,562,495	13.84
Mississippi	2	2	0	2	0	0	0	6	2,984,469	2.01
Missouri	2	3	13	1	1	6	3	29	6,107,902	4.75
Montana	2	4	2	0	1	3	0	12	1,051,810	11.41
Nebraska	0	2	3	1	2	6	3	17	1,913,019	8.89
Nevada	3	1	6	0	2	5	2	16	2,976,982	5.37
New Hampshire	5	1	3	0	4	0	0	13	1,349,707	9.63
New Jersey	84	60	51	25	20	68	2	310	8,880,668	34.91
New Mexico	0	3	5	0	1	2	1	12	2,095,059	5.73
New York	70	109	136	38	30	105	4	492	19,555,000	25.16
North Carolina	8	9	13	3	12	18	5	68	10,272,234	6.62
North Dakota	0	1	2	0	0	0	0	3	756,605	3.97
Ohio	9	11	6	6	7	12	2	53	11,657,896	4.55
Oklahoma	0	2	5	2	10	1	0	20	3,933,771	5.08

CONCLUSION

Both our hypotheses are **TRUE**: Southern States/territories (CA/AZ/LA/FL/Puerto Rico/Am. Samoa/Virgin Islands) have more disease cases than the Northern states/territories. New York is the only Northern state with high cases.

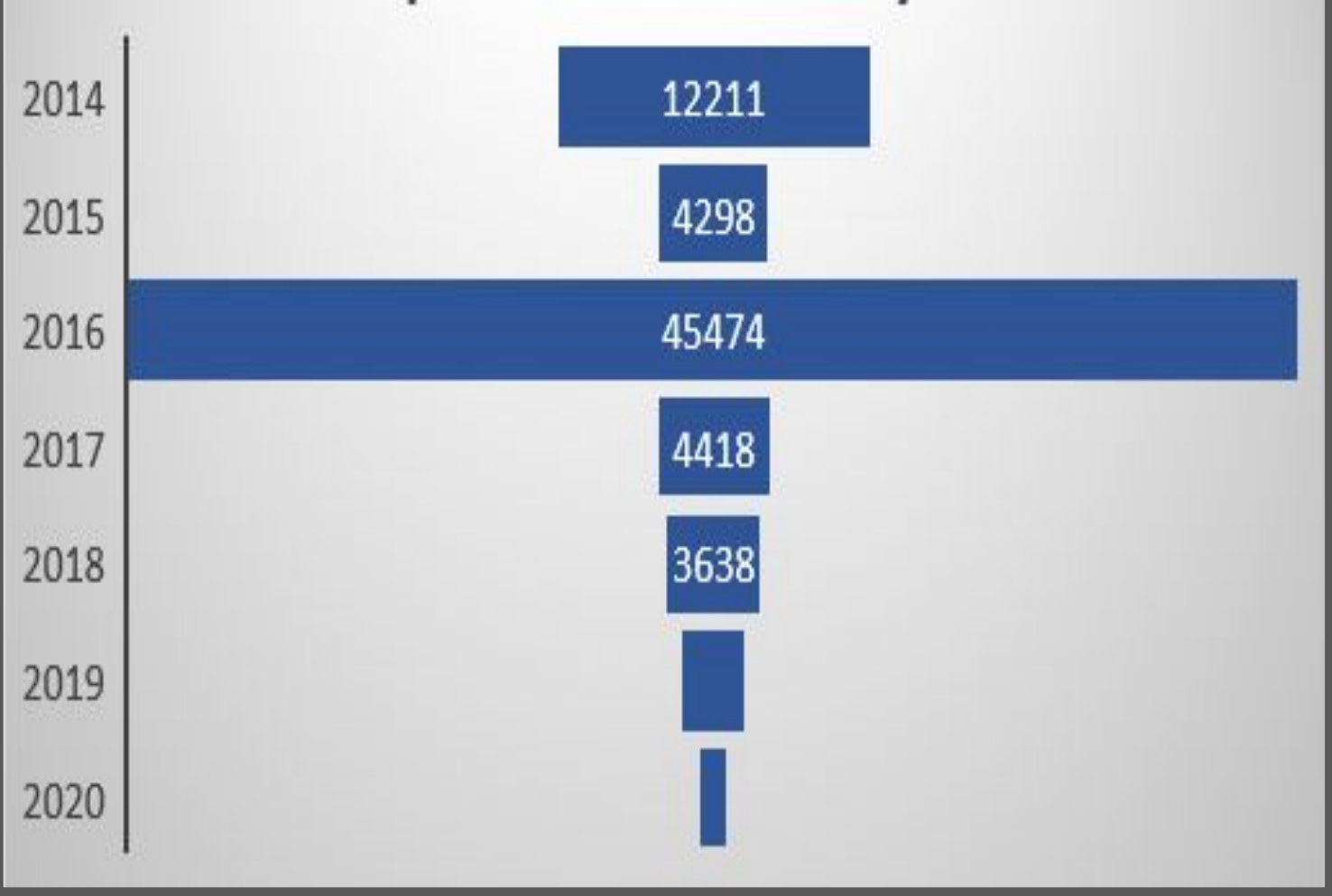
The number of mosquito-borne cases have decreased over the years as shown by the trendlines.

Mosquito-borne diseases in US



Zika is the mosquito-borne disease with the maximum number of cases

Mosquito-borne cases by Year



Total cases have decreased over the years except 2016 (due to massive Zika outbreak)