**Executive Summary**

My capstone will be examining tick-borne diseases from a national perspective and narrowing in scope to the state and county level. When I was younger growing up in the Northeast, I contracted Lyme disease twice, but I have always heard there is not any Lyme disease down here in Nashville, TN where I now reside. We will explore if this is true or not using surveillance data provided by the CDC, the NIH, and the State of Tennessee. Then, looking beyond Lyme disease, we will look at the data to see if there are other tick-borne risks that we need to be concerned about here in Davidson County, TN.

**Motivation**

Growing up in the Northeast, I have had Lyme disease twice, which we caught early and were able to treat before it led to anything significant. I’m always concerned about ticks when out in nature, but I’ve heard there really isn’t Lyme down here in the South. I’d like to explore data on Lyme disease, ticks, and any other tick-borne illnesses across the US, TN, and here in Nashville, specifically to see if that’s true or not.

**Data Question**

“What is the estimated risk of contracting Lyme disease from a tick bite in Nashville, TN?”

**Minimum Viable Product (MVP)**

My capstone project will be a powerpoint presentation with visualizations created in PowerBI, Tableau, and Python. The capstone will begin with my motivation for the topic, general background information on lyme disease and how it’s transmitted, symptoms, treatments, etc. The data will be presented at a national level then state, county, and finally, Nashville, TN in particular. We will see various visualizations showing case counts, incident rates, top prevalence areas and so on. We will then examine case rates for other various tick-borne diseases across the country, states, and Tennessee. We will see what the biggest tick-borne risk is for us here in Nashville, TN. Finally, discuss trends in cases reported by month, potentially risk by demographic like age, and then prevention. The intended audience is for anyone, so I want to make this as easy to understand as possible because anybody who spends time outdoors could be affected by a tick-borne disease- I think everyone will be interested in the data and results based on where they live.

**Schedule (through <8/29>)**

1. Get the Data (8/11)
2. Clean & Explore the Data (8/13)
3. Create Presentation of your Analysis (8/27)

* Should be a presentation, but could include a Jupyter Notebook or dashboard in Excel, Tableau, or PowerBI

1. Internal demos (8/22)
2. Demo Day!! (8/29

**Data Sources**

* Lyme Specific Data- CDC
  + [Lyme Disease Surveillance Data | Lyme Disease | CDC](https://www.cdc.gov/lyme/data-research/facts-stats/surveillance-data-1.html)
  + Lyme Disease Cases by State or Locality -Cases counts by state and year (2008-2023)
  + Lyme Disease Overall Cases by Year- 1996-2023
  + Demographic tables- 2010-2023
  + By month -2010-2023
* Lyme reports cases by COUNTY 2001-2023- CDC
  + [Lyme Disease Case Maps | Lyme Disease | CDC](https://www.cdc.gov/lyme/data-research/facts-stats/lyme-disease-case-map.html)
* Emergency Departments Visits for Tick Bites- US- Jan 2017 – Dec 2019- National Institute of Health- US GOV
  + [Emergency Department Visits for Tick Bites — United States, January 2017–December 2019 - PMC](https://pmc.ncbi.nlm.nih.gov/articles/PMC8084121/#F1)
* Population Sizes by US and state- US Census Data
  + Historical- [Historical Population Change Data (1910-2020)](https://www.census.gov/data/tables/time-series/dec/popchange-data-text.html)
  + By state 2020-2024 [County Population Totals: 2020-2024](https://www.census.gov/data/datasets/time-series/demo/popest/2020s-counties-total.html)
* Tickborne Diseases Case Counts by County TOTAL 2019-2022- not broken down by year- CDC
  + [Geographic Distribution of Tickborne Disease Cases | Ticks | CDC](https://www.cdc.gov/ticks/data-research/facts-stats/geographic-distribution-of-tickborne-disease-cases.html?CDC_AAref_Val=https://www.cdc.gov/ticks/data-summary/geographic-distribution.html)
* Tickborne Diseases Reported Cases TOTAL 2019-2022 show in chart- CDC
  + Downloadable files show for 2016-2019
  + [Tickborne Disease Surveillance Data Summary | Ticks | CDC](https://www.cdc.gov/ticks/data-research/facts-stats/tickborne-disease-surveillance-data-summary.html)
* Tennessee County level cases for ALL tick borne illnesses from 2013-2023 via the state data request

**Known Issues and Challenges**

* I wanted to use the data found on this website from the Tennessee Department of Heatlth ([Interactive Disease Data](https://www.tn.gov/health/ceds-weeklyreports/interactive-disease-data.html)), but it is not available for download.
* I have requested the data from the state for all tick-borne diseases on the county level
* Data looks fairly straightforward, but varying years, so need to decide on how to handle the different time frames
* May need to clean county level data, so that it matches up with census data
* The CDC total cases for all tickborne diseases has a chart that shows data form 2019-2022, but the downloadable data is 2016-2019. Can either webscrape that 2019-2022 table or copy it by hand

Data Used:

State Population estimates 2000-2009

* [Index of /programs-surveys/popest/datasets/2000-2008/state/totals](https://www2.census.gov/programs-surveys/popest/datasets/2000-2008/state/totals/)

State Population estimates 2010-2019

* <https://www.census.gov/data/tables/time-series/demo/popest/2010s-state-total.html>

State Population estimates 2020-2024

* <https://www.census.gov/data/tables/time-series/demo/popest/2020s-state-total.html>

Case Count by State 2008-2023

* <https://www.cdc.gov/lyme/data-research/facts-stats/surveillance-data-1.html>

Overall US Case Count by Year- 1996-2023

* <https://www.cdc.gov/lyme/data-research/facts-stats/surveillance-data-1.html>

Percent of Cases by Age Range and Year

* <https://www.cdc.gov/lyme/data-research/facts-stats/surveillance-data-1.html>

Case Count by Month 2010-2023

* <https://www.cdc.gov/lyme/data-research/facts-stats/surveillance-data-1.html>

Case Count by County 2001-2023

* https://www.cdc.gov/lyme/data-research/facts-stats/lyme-disease-case-map.html

All tickborne disease Case Count by County 2019-2022 (TOTAL)

* <https://www.cdc.gov/ticks/data-research/facts-stats/geographic-distribution-of-tickborne-disease-cases.html>

All tickborne disease case count by year

* https://www.cdc.gov/ticks/data-research/facts-stats/tickborne-disease-surveillance-data-summary.html

All tickborne disease case count by month

* <https://www.cdc.gov/ticks/data-research/facts-stats/tickborne-disease-surveillance-data-summary.html>

All tickborne disease cases by month, state, total requests

* <https://wonder.cdc.gov/controller/datarequest/D130;jsessionid=03B5D8E9FB055CA997013A52ECCD>

State of TN data request- same data from this table:

* https://www.tn.gov/health/ceds-weeklyreports/interactive-disease-data.html

TN Census Population Data 2020-2024

* <https://www.census.gov/data/datasets/time-series/demo/popest/2020s-counties-total.html>

Census Population Estimates data 2010-2019

* <https://www2.census.gov/programs-surveys/popest/datasets/2010-2020/counties/totals/>

ER visits due to tickborne diseases

* <https://pmc.ncbi.nlm.nih.gov/articles/PMC8084121/#F1>

Supporting Documentation

2003

A map of the united states

AI-generated content may be incorrect.

2013

A map of the united states

AI-generated content may be incorrect.

2023

A map of the united states

AI-generated content may be incorrect.