RELATIONSHIP BETWEEN MELANOMA AND HIKING IN WASHINGTON STATE

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ABSTRACT

Though Washington state is one of the cloudiest places in the United States, it is top ten in skin cancer rates [1]. This project aims to find a correlation between recreational activity, specifically hiking, and melanoma rates. Data for each county was collected from WA state databases and compared using a regression model.
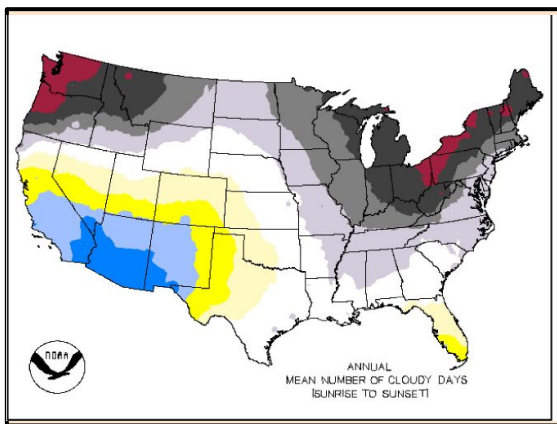
FIGURE #2
Western Washington is one of the cloudiest areas in the USA according to this figure.
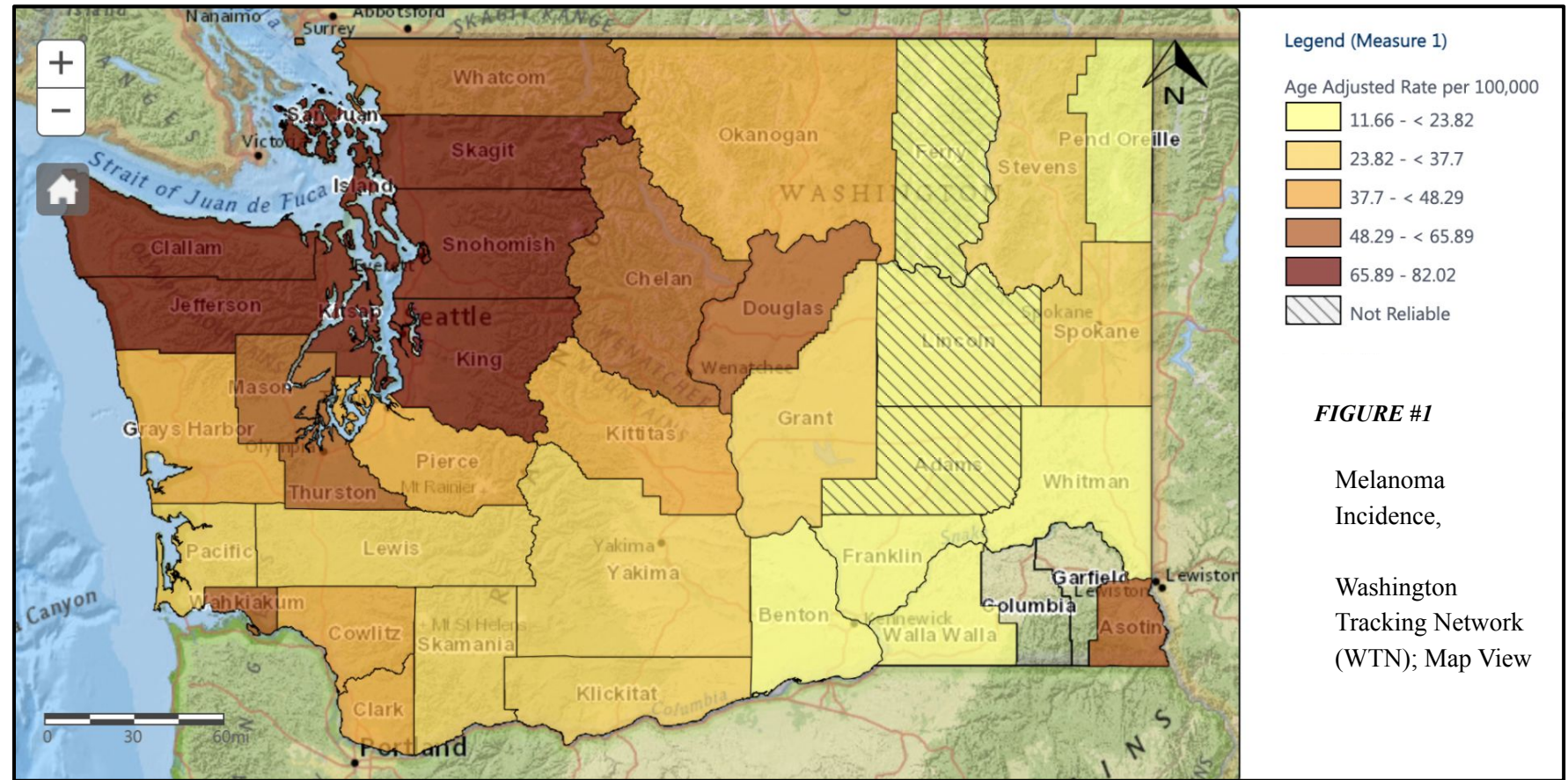*Annual Mean Number of Cloudy Days, NOAA*

FIGURE #1

Melanoma Incidence,

Washington Tracking Network (WTN); Map View

BACKGROUND

According to the CDC, Washington is in the top ten states with the highest rates of melanoma and skin cancer diagnosis, with a growth rate of 2% each year after 2000 [1]. Generally, this is a surprise to many, as Washington has a clear reputation of having no sunlight. In fact the precipitation in Washington state is also one of the highest ranked for cloud coverage (See figure #2). The common misconception between the public is that if there are lots of clouds, there's less sunshine, and therefore less UV exposure, but this is not accurate. Which could possibly be the reason for such high rates of skin cancer in Washington State, especially in the areas with higher precipitation/ cloud coverage like Western Washington. These areas also tend to be places with high outdoor activity throughout the year, such as hiking spots [3]. The correlation between high outdoor activity and sun exposure is obvious, but it is crucial to analyze this further and how high outdoor activity, without sun protection may be the cause of high melanoma rates in Washington State.

POSSIBLE SOLUTIONS

- More research should be done in the area comparing rates of melanoma and recreation without sun protection use
- Increasing sun protection education for Washingtonians
    - Directly warning hikers on hiking trails of the effects of not using sun protection
    - Specifically having people of color as a target audience in order to decrease current health disparities

HEALTH DISPARITIES IN SKIN PROTECTION EDUCATION

Sun protection behavior, n (%)	Total sample (n = 1554; 100%)	White (n = 1078; 69%)	Black (n = 155; 10%)	Hispanic (n = 259; 17%)	Asian (n = 62; 4%)	Test of differences (ANOVA, chi-square, Fisher's Exart)
Sunscreen						p < 0.001
Never, rarely or sometimes	1031 (67.0)	665 (62.4)	133 (86.9)	189 (73.5)	44 (71.0)	
Often or always	507 (33.0)	401 (37.6)	20 (13.1)	68 (26.5)	18 (29.0)	
Sleeved shirt						p = 0.16
Never, rarely or sometimes	534 (40.0)	356 (37.7)	54 (41.9)	100 (45.7)	24 (41.4)	
Often or always	816 (60.4)	588 (62.3)	75 (58.1)	119 (54.3)	34 (58.6)	
Seek shade						p = 0.28
Never, rarely or sometimes	1058 (68.8)	749 (70.3)	98 (64.1)	169 (65.8)	42 (67.7)	
Often or always	480 (31.2)	317 (29.7)	55 (36.0)	88 (34.2)	20 (32.3)	

FIGURE #6
Correlates of sun protection behaviors in racially and ethnically diverse U.S. adults, Calderón, T. A

The importance of skin protection is rarely emphasized in and of itself, but it's even less stressed to people of color. Though skin cancer is widely more common in populations with lighter skin color, people of color are often four times more likely to be diagnosed in later stages of skin cancer. People of color also are less likely to be prescribed sunscreen, about nine times less, and this effect has been clearly seen in past studies [5]. For example, a study done in 2019 showed that Black people's use of sunscreen was significantly lower than their white counterparts [4]. There is a current lack of skin protection education, but a severe lack of skin protection education aimed toward people of color. As a society, we must aim to fix this.
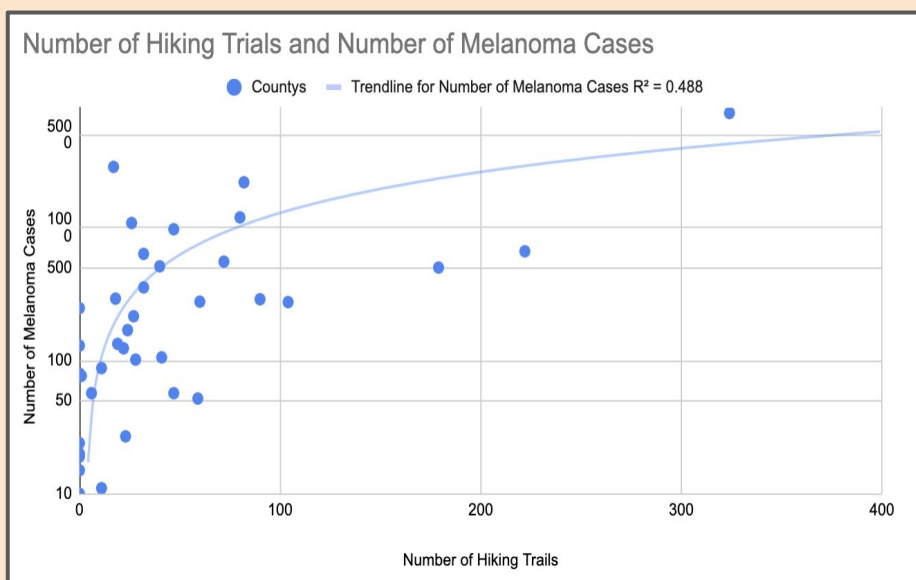
DATA ANALYSIS

FIGURE #3
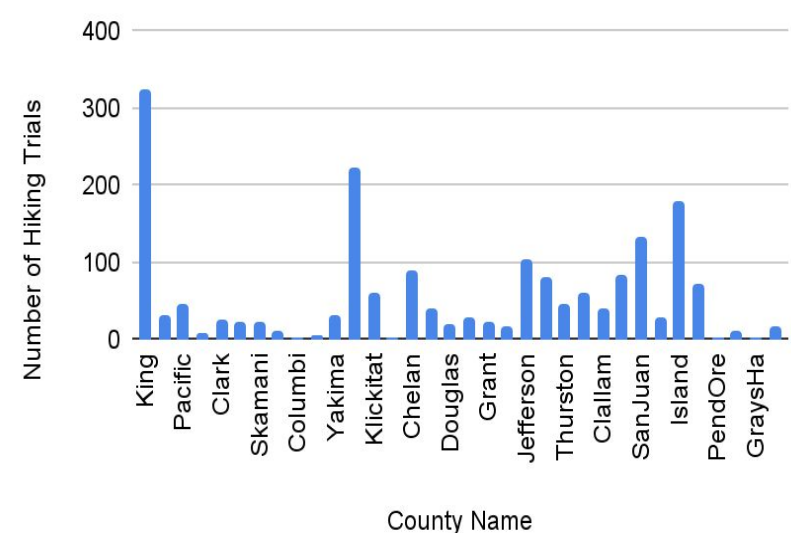

FIGURE #4
PARKS - Trails; Washington Geospatial Open Data Portal
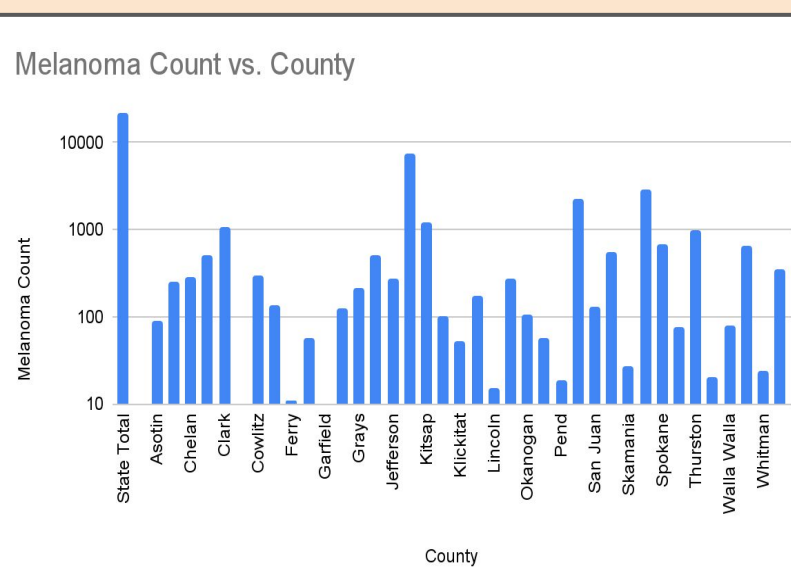

FIGURE #5
Melanoma Incidence; Washington Tracking Network (WTN)

MATERIALS & METHODS

- Baseline data from Washington Tracking Network (WTN) on Melanoma Age Adjusted Rates
- Baseline data of Washington State Trials from Washington Geospatial Open Data Portal
- Regression Models to see if there is statistical significance and amount of variability in data

RESULTS

The R2 value of the regression model is 0.488, which means there is approximately a 50% variability in the data. So we can not make any concrete conclusions that the trendline of Melanoma cases is directly associated with the number of available hiking spots in the area. Since the data used here was of the number of hikes in the area and not the number of hikers, this analysis could have been inaccurate (currently, there are no public databases with the number of hikers per year from each county). We can still see that some areas with more hiking spots tend to have an increased number of cases, like Spokane and King County.

REFERENCES

[1] Skin cancer increasing in Washington; Melanoma incidence rates highest in Puget Sound counties | Washington State Department of Health. (2019). Wa.gov. https://doh.wa.gov/newsroom/skin-cancer-increasing-washington-melanoma-incidence-rates-highest-puget-sound-counties

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[4] Calderón, T. A., Bleakley, A., Jordan, A. B., Lazovich, D., & Glanz, K. (2019). Correlates of sun protection behaviors in racially and ethnically diverse US adults. Preventive medicine reports, 13, 346-353.

[5] Jewell, T. (2017, May 18). Acral Lentiginous Melanoma. Healthline; Healthline Media. https://www.healthline.com/health/acral-lentiginous-melanoma

[6] *PARKS - Trails*. (2016). Wa.gov. https://geo.wa.gov/datasets/wa-stateparks::parks-trails-1/about

[7] Melanoma - Symptoms and causes. (2022). Mayo Clinic; https://www.mayoclinic.org/diseases-conditions/melanoma/symptoms-causes/syc-20374884

Project Reflection

How I choose my topic:

        I tried to find health concerns that Washington State specifically faces, and with a few google searches and some further research, I found out about the rates of Skin Cancer/Melanoma in the state. This was shocking to me, as probably to many, because with such a cloudy environment, I would not anticipate Washington to have so many cases of Melanoma. I also felt a personal connection to the topic since I rarely think about sun protection, especially since I am a Person of Color. I have been told in the past that since my skin is darker, it won't burn easily, and I shouldn't be as worried about skin cancer and such. It was surprising to me that this isn't the case, and UV rays are just as harmful to darker skin tones as lighter ones.

Approach:

        I used google sheets to visualize and analyze most of the data I found. Google Sheets is an easy-to-navigate effective statistical analysis tool, so I choose to use it over other methods. Using the trendline function, I calculated the trend in the data between melanoma rates and hiking trails per county.

Challenges:

        There was no data on the number of people from each county that went hiking, so I used data regarding how many trails were in each county. Though this definitely shifted my data analysis, we could still anticipate and correlate some results. I think a more concrete study done on recreational activity and melanoma rates could really help us better understand why there are so many cases of melanoma in Washington. I think more than providing concrete evidence that outdoor activities without sun protection cause melanoma, my study shows the lack of research done in the area and how much else must be done.

Support:

        Due to the timeline of when I finished my project, I was unable to get much help from any mentors.