## Quality of Life

The University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation release annually the County Health Rankings (the Rankings) – a ranking of population health for the over 3,000 United States counties.[[1]](#footnote-1) The rankings are based upon a collection of health outcomes (mortality and morbidity, and quality of life) and health factors (health behaviors, clinical care, social and economic factors, and the physical environment). Over 30 measures are assembled into composite scores before counties are ranked within each state.

The ranking uses a weighted composite of five measurements to create the health outcomes measure.[[2]](#footnote-2)

|  |  |  |  |
| --- | --- | --- | --- |
| Health Outcomes | Measure | Weight | Data Source |
| Length of Life | Premature Death | 50% | National Center for Health Statistics |
| Quality of Life | Poor or fair health | 10% | Behavioral Risk Factor Surveillance System |
|  | Poor physical health days | 10% | Behavioral Risk Factor Surveillance System |
|  | Poor mental health days | 10% | Behavioral Risk Factor Surveillance System |
|  | Low birthweight | 20% | National Center for Health Statistics |

The Rankings determine quality of life based on three measurements from the Behavior Risk Factor Surveillance System along with an additional measurement from the National Center for Health Statistics. The Behavioral Risk Factor Surveillance System has replaced the Behavioral Risk Factor Data, the dataset we are using, as the national source for health risk information. The most comparable measurements in our dataset to those used in the rankings are Percentage with Fair or Poor Self-Rated Health, Mean Physically Unhealthy Days, and Mean Mentally Unhealthy Days. The measurements are not exactly comparable due to different study design, but they are sufficiently close that we can use them as part of our quality-of-life analysis.

An additional measurement used in the Rankings is low birth weight (% live births <2500 g) from the National Center for Health Statistics, a part of the Centers for Disease Control. Low birth weight data is available via the Vital Statistics Online Data Portal (<https://www.cdc.gov/nchs/data_access/vitalstatsonline.htm>) for 1968 to 2020. The files include the birth weight and demographic information about each birth via freely available, fixed width data file. The data files are extremely large and require considerable data processing to extract the data and compile it to a form usable in this project. For these reasons, the low birth weight will not be included during the first iteration of the project and will be included only if time permits.

## Will Quality of Life Vary by State?

The Rankings show significant changes in their overall rankings from one county to the next. The

## Hypotheses

My basic hypothesis involves the correlation between each of the three quality of life measurements and state population. I expect that the measurements are not correlated with state population. This is based upon a simple thought experiment comparing the states of Minnesota, Mississippi, and New York. Mississippi historically has among the lowest quality of life measurements while Minnesota and New York are usually highly ranked. Mississippi has a higher population than Minnesota but a lower population than New York leading to a skepticism that quality of life is correlated to population.

A secondary correlation hypothesis is that the quality-of-life measurements are highly correlated to each other. This is expected as a low quality of life by one measurement should intuitively be followed by ranking in others. This is strengthened by a quick look at the county ranking in the County Health Rankings mentioned above.

The hypotheses will be tested by making correlation matrices and associated scatterplots with trendlines.

1. Remington, P.L., Catlin, B.B. & Gennuso, K.P. The County Health Rankings: rationale and methods. *Popul Health Metrics* **13,**11 (2015). https://doi.org/10.1186/s12963-015-0044-2 [↑](#footnote-ref-1)
2. Ibid, pg. 5. [↑](#footnote-ref-2)