Internship Project: Statistical analysis of select series highlighted in the HICAHS Data Hub

Overview: The new HICAHS Data Hub (https://hicahs-centroid-collaboration-csurams.hub.arcgis.com/) provides capacity for compelling visualizations of correlations between environmental risk and worker population concentrations in the Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming service area. Economic valuations associated with the extent of agricultural activity (e.g., sales) can also be visualized spatially through this Hub as can densities of healthcare services and infrastructures among other indicators.

Internship project is particularly interested in the "Climate & Environmental Impact Data" Priority area.

Questions:

(1) What is the relationship between health risk factors and worker densities in the HICAHS area?

First pass:

- calculate unconditional correlations between worker concentrations (e.g., totals) and fire and heat environmental exposure scales (identified on website as capturing aspects of "human risk")
- similar correlations for other available indicators that may be of interest
- use county-level as the geo observational unit

(2) What is the relationship between health risk concentrations and economic output?

First pass: calculate correlations between environmental exposures and farm sales (and/or other econ variables) to understand economic linkages

(3) What is the relationship between health risk concentrations and healthcare market supply? (goal is to ultimately assess health care supply-side institutional capacities and possible gaps)

First pass: calculate correlations between environmental risk variables and health care services/ infrastructure (particularly for data series identified as targeting "migrant" health) but others too

Next preview thoughts:

Part 2: Would eventually like to build multivariate models. What county-level socioeconomics and other observables would be worth merging to use as controls? Web/library search for external county-level data from additional sources.

Part 3: Will eventually want to consider population and/or spatial weights for all but let's do that in next steps. Please save an document all code as you go so that adding weights can be done easily later.

Original data request is pasted on next pages for reference.

Centroid Data Request, Exports to CSV or similar--*From Priority Problems Webpages, URLs below*

Natural Disaster Risk and Impact (https://hicahs-centroid-collaboration-csurams.hub.arcgis.com/apps/1ff51926aada4a85a74ee89ba1a2539b/explore)
H2A Worksite Locations & Physical Requirements, DOL 2023
--TOTAL_WORKERS_H2A_CERTIFIED--*county totals*
--LIFTING_AMOUNT--*county mean, county standard deviation*

Crop Land Use, Sentinel-2 10m Land Use/Land Cover 2022 (obtained from ArcGIS Living Atlas)
--*Any way to create fraction of county land area from this? (if not, no worries)*

Heat, Agriculture, and Human Risk (https://hicahs-centroid-collaboration-csurams.hub.arcgis.com/apps/6c134caadaed461d882659dd96c2cbef/explore)
July Max Temp by County, NOAA 2023--*all already county level but not exportable*
--POPULATION_2020
--POP20_SQMI
--SQMI
--Value
--Rank
--Anomaly (1901-2000 base period)
--1901-2000 mean

August Max Temp by County, NOAA 2023--*all already county level but not exportable*
--Value
--Rank
--Anomaly (1901-2000 base period)
--1901-2000 mean

Health Facility Locations and Priority Populations (https://hicahs-centroid-collaboration-csurams.hub.arcgis.com/apps/4ab4de98bb664e41b6b5c9ad70e51da4/explore)
Wyoming State Regulated Health Facilities, Wyoming Department of Health 2024
--RURAL HEALTH CLINICS--*number per county*
--CRITICAL ACCESS HOSPITALS--*number per county*
--HOSPITALS--*number per county*

Utah State Regulated Health Facilities, Utah Geospatial Resource Center 2023
--URGENT CARE CLINIC--*number per county*
--CLINIC--*number per county*
--HOSPITAL--*number per county*
--COMMUNITY MENTAL HEALTH CENTERS--*number per county*
--RURAL HEALTH CLINICS--*number per county*
--MENTAL HEALTH--*number per county*

South Dakota State Regulated Health Facilities, South Dakota Department of Health 2024
--RURAL HEALTH CLINIC--*number per county*
--CRITICAL ACCESS HOSPITAL--*number per county*
--HOSPITAL--*number per county*
North Dakota State Regulated Health Facilities, North Dakota Health and Human Services 2024

--RURAL HEALTH CLINIC--*number per county*
--HOSPITAL--*number per county*

Montana State Regulated Health Facilities; Montana Primary Care Association 2022, Montana
Department of Public Health and Human Services 2024
--SATELLITE CLINIC--*number per county*
--CRITICAL ACCESS HOSPITAL--*number per county*
--MENTAL HEALTH CENTER--*number per county*
--HOSPITAL--*number per county*
--MONTANA COMMUNITY HEALTH CENTERS--*number per county*
--SEASONAL/MIGRANT CLINICS--*number per county*
--N/A--*number per county*

Colorado State Regulated Health Facilities, Colorado Department of Public Health and Environment 2024
--HOSPITAL--*number per county*
--RURAL HEALTH CLINICS--*number per county*
--BEHAVIORAL HEALTH ENTITY--*number per county*
--COMMUNITY MENTAL HEALTH--*number per county*
--COMMUNITY CLINICS--*number per county*

Indian Health Service Facilities, Indian Health Service 2024
--HEALTH CENTER--*number per county*
--HOSPITAL--*number per county*
--BEHAVIORAL HEALTH FACILIITY--*number per county*

--School Based Health Clinics, School Based Health Alliance 2024--*number per county*
--Migrant Health Center Site Locations, National Center for Farmworker Health 2022--*number per county*
--Primary Care Clinics Receiving Grant Funding Supporting Migrant Health, HRSA 2023--*number per county*

POPULATION DENSITY: --*all already county level but not exportable*
--fogn_born_popn_21
--fogn_born_popn_20
--ag_mine_wkers_21
--ag_mine_wkers_20

Healthcare Service Density and Priority Populations (https://hicahs-centroid-collaboration-csurams.hub.arcgis.com/apps/e299ebe2afcb4354a53e62cae56ed007/explore)
POINT LOCATION:
--Migrant Health Center Site Locations, National Center for Farmworker Health 2022--*total by county*
--Primary Care Clinic Locations Receiving Grant Funding Supporting Migrant Health, HRSA 2023--*total by county*

LOCATION DENSITY: --*all already county level but not exportable*
--Hospitals_21
--RuralReferralCenters_21
--SoleCommunityProviders_21
--CommunityOutreachHospitals_21

--HopsitalsWPsychEdu_21
--HospWPsychEmergServ_21
--HospWPsychOutpatientServ_21
--HospWSuicidePrevServ_21
--RuralHealthClinics_22
--ComnMentHlthCtr_22
--NHSC_Sites_23