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| **Demographics** | | | | |
| **Measure** | **Source** | **Most Recent Year Available** | **Technical Notes** | **Variable Name** |
| **Age** | Colorado State Demography Office <https://demography.dola.colorado.gov/data/> | 2018  2020 (estimates) | 0-18  19-64  65+  60+  ***Census Groups:***  Under 5 years  5-9 years  10-14 years  15-19 years  20-24 years  25-29 years  30-34 years  35-39 years  40-44 years  45-49 years  50-54 years  55-59 years  60-64 years  65-69 years  70-74 years  75-79 years  80-84 years  85+ years | pop\_0\_18\_perc  pop\_19\_64\_perc  pop\_60\_over\_perc  pop\_65\_over\_perc  pop\_5\_under\_perc pop\_5\_9\_perc  pop\_10\_14\_perc pop\_15\_19\_perc pop\_20\_24\_perc pop\_25\_29\_perc pop\_30\_34\_perc pop\_35\_39\_perc pop\_40\_44\_perc pop\_45\_49\_perc pop\_50\_54\_perc pop\_55\_59\_perc pop\_60\_64\_perc pop\_65\_69\_perc pop\_70\_74\_perc pop\_75\_79\_perc pop\_80\_84\_perc pop\_85\_over\_perc  **NOTE: We will use the following age groups to align with our disease models:**  0-19  20-39  40-64  65+ |
| **Race** | Colorado State Demography Office <https://demography.dola.colorado.gov/data/> | 2019 (estimates) | White  Black  Asian/Pacific Islander  American Indian | WHITE\_perc  BLACK\_perc ASIAN\_PAC\_ISL\_perc AMER\_IND\_perc |
| **Race** | American Community Survey 5-year estimates <https://www.census.gov/programs-surveys/acs/data.html> (<https://data.census.gov/cedsci/advanced> | 2018 | White  Black  American Indian/Alaska Native  Asian  Native Hawaiian/Pacific Islander  Other | white\_not\_hisp\_ACS black\_not\_hisp\_ACS AI\_AN\_not\_hisp\_ACS asian\_not\_hisp\_ACS NH\_PI\_not\_hisp\_ACS other\_not\_hisp\_ACS |
| **Ethnicity** | American Community Survey 5-year estimates <https://www.census.gov/programs-surveys/acs/data.html> (<https://data.census.gov/cedsci/advanced> | 2018 | Hispanic  Non-Hispanic | hispanic\_ACS  (not in dataset but implicit) |
| **Language** | American Community Survey 5-year estimates <https://www.census.gov/programs-surveys/acs/data.html> (<https://data.census.gov/cedsci/advanced>  CDC SVI dataset  <https://svi.cdc.gov/data-and-tools-download.html> | 2018 | Spanish  Indo-European  Asian and Pacific Island  Other  Persons age 5+ who Speak English Less Than Well (from CDC SVI) | lang\_spanish\_only  lang\_indo\_european\_only lang\_asian\_PI\_only lang\_other\_only less\_than\_well\_ENG |
| **Household Size** *(Physical Environment)* | Colorado State Demography Office  <https://demography.dola.colorado.gov/population/data/profile-county/>  CDC SVI dataset  <https://svi.cdc.gov/data-and-tools-download.html> | 2018 | Average number of household members  Percentage of occupied housing units with more people than rooms estimate (from CDC SVI)   * (Occupied housing units with more people than rooms estimate / Occupied housing units estimate)\*100 | household\_size  crowded\_housing |
| **Population Density** | Colorado State Demography Office  <https://demography.dola.colorado.gov/population/data/profile-county/> | 2018 | Population density per square mile | pop\_density\_sqmi |

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| **Social and Economic Factors** | | | | |
| **Measure** | **Source** | **Most Recent Year Available** | **Technical Notes** | |
| Education | American Community Survey 5-year estimates <https://www.census.gov/programs-surveys/acs/data.html> (<https://data.census.gov/cedsci/advanced>)  CDC SVI dataset  <https://svi.cdc.gov/data-and-tools-download.html> | 2018 | *(Population 25 years and over)*  High school or less *(includes “Less than 9th grade”, “9th to 12th grade, no diploma” and “High School Graduate”)*  Some College *(includes “Some College” and “Associate’s degree”)*  Bachelor’s or more *(includes Bachelor’s degree and Graduate or Professional degree)*  Persons (age 25+) with no high school diploma (CDC SVI) | high\_school\_diploma  some\_college  bach\_or\_more  no\_high\_school\_dip |
| Occupation | American Community Survey 5-year estimates <https://www.census.gov/programs-surveys/acs/data.html> (<https://data.census.gov/cedsci/advanced>) | 2018 | *(Civilian employed population 16 years and over)*  Management, business, science, and arts occupations  Service occupations  Sales and office occupations  Natural resources, construction, and maintenance occupations  Production, transportation, and material moving occupations | manag\_biz\_sci\_arts\_occ  service\_occ  sales\_office\_occ nat\_construction\_maint\_occ  prod\_transp\_mat\_occ |
| Industry | American Community Survey 5-year estimates <https://www.census.gov/programs-surveys/acs/data.html> (<https://data.census.gov/cedsci/advanced>) | 2018 | *(Civilian employed population 16 years and over)*  Agriculture, forestry, fishing and hunting, and mining  Construction  Manufacturing  Wholesale Trade  Retail Trade  Transportation and warehousing, and utilities  Information  Finance and insurance, and real estate and rental and leasing  Professional, scientific, and management, and administrative and waste management services  Educational services, and health care and social assistance  Arts, entertainment, and recreation, and accommodation and food services  Other services, except public administration  Public administration | agri\_forestry\_ind  construction\_ind  manuf\_ind  wholesale\_ind  retail\_ind  transp\_ware\_util\_ind  information\_ind  finance\_ins\_ind  prof\_sci\_ind  edu\_health\_social\_ind  arts\_ent\_rec\_ind  other\_ind  public\_admin\_ind |
| Unemployment | CDC SVI dataset  <https://svi.cdc.gov/data-and-tools-download.html> | 2018 | The ACS calculated Unemployment Rate = total unemployed/civilian population age 16+ in the labor force | unemployment |
| Uninsurance | Uninsured in the total civilian noninstitutionalized population | uninsurance |
| Income | Per capita income | per\_cap\_income |
| Poverty | Percentage of persons below poverty estimate | below\_poverty |
| CDC Social Vulnerability Index | CDC SVI dataset  <https://svi.cdc.gov/data-and-tools-download.html> | 2018 | Overall SVI Ranking  Ranking by theme:  Socioeconomic  Household Composition/Disability  Minority Status/Language  Housing Type/Transportation | SVI\_overall\_rank  socio\_econ\_rank household\_disab\_rank  minority\_language\_rank household\_disab\_rank |
| Social Distancing Index | Colorado Health Institute and American Community Survey <https://www.coloradohealthinstitute.org/research/colorado-covid-19-social-distancing-index> | 2018 |  | TBD |

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| **Morbidity (Disease Prevalence)** | | | | |
| **Measure** | **Source** | **Most Recent Year Available** | **Technical Notes** | |
| Asthma | Colorado Department of Public Health and Environment (CDPHE): CO Behavioral Risk Factor Surveillance System (2014-17)  <http://www.cohealthmaps.dphe.state.co.us/cdphe_community_level_estimates/> | 2017 | Percent of Adults 18+ ever diagnosed with Asthma by a doctor, nurse, or other health professional, and still having the condition | To be added to dataset |
| Cardiovascular Disease | Percent of Adults 18+ ever diagnosed with Angina or Coronary Heart Disease by a doctor, nurse, or other health professional | To be added to dataset |
| Current Smoking | Percent of Adults 18+ who currently Smoke Cigarettes | To be added to dataset |
| Diabetes | Percent of Adults 18+ ever diagnosed with Diabetes by a doctor, nurse, or other health professional | To be added to dataset |
| Obesity | Percent of Adults 18+ with a Body Mass Index greater than or equal to 30 | To be added to dataset |
| Obesity  Cardiovascular Disease  COPD  Diabetes  Chronic Kidney Disease  Any Condition | Centers for Disease Control and Prevention (CDC): Behavioral Risk Factor Surveillance System  BRFSS respondents were classified as having an underlying medical condition if they answered “yes” to any of the following questions: “Have you ever been told by a doctor, nurse, or other health professional that you have COPD, emphysema, or chronic bronchitis; heart disease (angina or coronary heart disease, heart attack, or myocardial infarction); diabetes; or chronic kidney disease?” Respondent-reported height and weight were used to calculate BMI; respondents with BMI ≥30 kg per m2 were considered to have obesity. A created variable captured persons having any of these conditions. | 2018 | <https://www.cdc.gov/mmwr/volumes/69/wr/mm6929a1.htm?s_cid=mm6929a1_w>  ***Prevalence estimates for adults 18+:***  Obesity  Heart disease  COPD  Diabetes  Chronic kidney disease  Any of the 5 conditions above  Nationwide estimates of underlying medical conditions were weighted to adjust for survey design. For county-level prevalence, estimates of each and of any condition were generated using a multilevel regression and poststratification approach (*5*) for 3,142 counties in all 50 states and DC. This approach has been validated in comparison with direct BRFSS survey estimates and local surveys for multiple chronic disease measures at state and county levels (*5*,*6*). Briefly, a multilevel regression model was constructed for each outcome using individual-level age,¶ gender, race/ethnicity,\*\* and educational-level†† data from the 2018 BRFSS, and data on county-level percentage of the adult population living at <150% of the poverty level from the 2014–2018 American Community Survey (ACS), a survey sent to about 3.5 million addresses each month that asks about topics not included on the decennial census, including education and employment. The model parameters were applied to 2018 Census county-level population estimates by age, gender, and race/ethnicity to calculate the predicted probability of each outcome. Because the U.S. Census Bureau does not provide county-level population data for education level by age, sex, and race/ethnicity, a bootstrapping approach§§ was used to impute it. The estimated prevalence was obtained by multiplying the probability by the total population by county. Model-based estimates for any condition were validated by comparing them with the weighted direct survey estimates from counties with sample size ≥500 (213) in BRFSS; the Pearson correlation coefficient was 0.89. The county-level estimates of having any underlying medical condition were categorized into six county urban/rural classifications using CDC’s National Center for Health Statistics definitions (large central metro/city, large fringe metro/suburb, medium metro, small metro, micropolitan, noncore/rural) (*7*). The overall weighted direct survey estimates were conducted using SUDAAN (version 11; RTI International), and other analyses were conducted using SAS (version 9.4; SAS Institute).  The underlying medical conditions included in these prevalence estimates were selected using the subset of the list of conditions with the strongest and most consistent evidence† of association with higher risk for severe COVID-19–associated illness on CDC’s website as of June 25, 2020 (*2*) and for which questions on the BRFSS aligned. These included chronic obstructive pulmonary disease (COPD), heart conditions, diabetes mellitus, chronic kidney disease (CKD), and obesity (defined as body mass index [BMI] of ≥30 kg per m2). Conditions from the list of those with mixed and limited evidence§ of association with increased risk for severe COVID-19 illness were not included (*2*). | obesity\_18\_over\_cdc\_est  heart\_dis\_18\_over\_cdc\_est  copd\_18\_over\_cdc\_est  diabetes\_18\_over\_cdc\_est  ckd\_18\_over\_cdc\_est  any\_condition\_18\_over\_cdc\_est |
| Chronic conditions among Medicare Beneficiaries 65+   * Diabetes * Hypertension * Cardiovascular disease * COPD * Asthma * Obesity (30+ BMI, 35+ BMI, all BMI focus on adults) * Multiple chronic conditions | CMS Chronic Condition Warehouse: Medicare Beneficiaries  <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Chronic-Conditions/Medicare_Beneficiary_Characteristics>  The data used in the chronic condition reports are based upon CMS administrative enrollment and claims data for Medicare beneficiaries enrolled in the fee-for-service program. These data are available from the CMS Chronic Condition Data Warehouse (CCW), [www.ccwdata.org](http://www.ccwdata.org).  Data Suppression: Data have been suppressed in cases when there are fewer than 11 Medicare beneficiaries in the cell. | 2017 | *(Medicare Beneficiaries 65+)*  Individual chronic conditions:  Prevalence estimates are calculated by taking the beneficiaries with a particular condition divided by the total number of beneficiaries in Medicare fee-for-service population, expressed as a percentage.  Diabetes  Hypertension  Cardiovascular disease:  Heart failure  Ischemic heart disease  Atrial fibrillation  COPD  Asthma  Multiple chronic conditions:  Prevalence estimates are calculated by taking the beneficiaries with a particular number of conditions divided by the total number of beneficiaries in our fee-for-service population, expressed as a percentage.  0 to 1 chronic conditions  2 to 3 chronic conditions  4 to 5 chronic conditions  6 + chronic conditions  *For all the chronic condition reports the Medicare beneficiary population is limited to fee-for-service beneficiaries. Medicare beneficiaries with any Medicare Advantage enrollment during the year were excluded since claims data are not available for these beneficiaries. Also, beneficiaries who were enrolled at any time in the year in Part A only or Part B only were excluded, since their utilization and spending cannot be compared directly to beneficiaries enrolled in both Part A and Part B. Beneficiaries who die during the year are included up to their date of death if they meet the other inclusion criteria.* | diabetes\_65\_over hypertension\_65\_over  heart\_failure\_65\_over ischemic\_heart\_65\_over  atrial\_fibr\_65\_over  copd\_65\_over  asthma\_65\_over  \_0\_1\_chronic\_65\_over  \_2\_3\_chronic\_65\_over  \_4\_5\_chronic\_65\_over  \_6\_more\_chronic\_65\_over |

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| **Morbidity (Hospitalization)** | | | | |
| **Measure** | **Source** | **Most Recent Year Available** | **Technical Notes** | |
| * Diabetes * Hypertension * Cardiovascular disease * COPD * Asthma * Influenza | Hospital Cost Utilization Project: State Inpatient Database  <https://www.hcup-us.ahrq.gov/sidoverview.jsp>  CIVHC (Center for Improving Value in Health Care) - <https://www.civhc.org/get-data/co-apcd-overview/>  CDPHE influenza data from current season  <https://www.colorado.gov/pacific/cdphe/influenza> | 2017 |  | TBD |

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| **Mortality** | | | | |
| **Measure** | **Source** | **Most Recent Year Available** | **Technical Notes** | |
| * Heart disease * Chronic respiratory disease * Diabetes * Influenza * Pneumonia | Centers for Disease Control and Prevention Wide-ranging Online Data for Epidemiologic Research (CDC WONDER): Underlying Cause of Death  <https://wonder.cdc.gov/ucd-icd10.html> | 2018 | <https://www.cdc.gov/nchs/data/dvs/Part9InstructionManual2017.pdf>  (Crude and age-adjusted rates per 100,000)  **Heart Disease:**  Diseases of heart (I00-I09,I11,I13,I20-I51)  Acute rheumatic fever and chronic rheumatic heart diseases (I00-I09)  Hypertensive heart disease (I11)  Hypertensive heart and renal disease (I13)  Ischemic heart diseases (I20-I25)  Acute myocardial infarction (I21-I22)  Other acute ischemic heart diseases (I24)  Other forms of chronic ischemic heart disease (I20,I25)  Atherosclerotic cardiovascular disease, so described (I25.0)  All other forms of chronic ischemic heart disease (I20,I25.1-I25.9)  Other heart diseases (I26-I51)  Acute and subacute endocarditis (I33)  Diseases of pericardium and acute myocarditis (I30-I31,I40)  Heart failure (I50)  All other forms of heart disease (I26-I28,I34-I38,I42-I49,I51)  **Chronic Respiratory Disease**  Chronic lower respiratory diseases (J40-J47)  Bronchitis, not specified as acute or chronic (J40)  Chronic Bronchitis (J41-J42)  Emphysema (J43)  Other chronic obstructive pulmonary disease (J44)  Asthma (J45-J46)  Bronchiectasis (J47)  **Diabetes**  Diabetes mellitus (E10-E14)  **Influenza**  Influenza (J09-J11)  **Pneumonia**  Pneumonia (J12-J18) | heart\_crude\_rate\_m heart\_age\_adjus\_rate\_m  resp\_crude\_rate\_m resp\_age\_adjus\_rate\_m  diabetes\_crude\_rate\_m diabetes\_age\_adjus\_rate\_m  flu\_crude\_rate\_m flu\_age\_adjus\_rate\_m  pneumonia\_crude\_rate\_m pneumonia\_age\_adjus\_rate\_m |
| Excess Mortality | CDC National Center for Health Statistics  <https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm#StateCountyData> | Cu |  | To be added to dataset |

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| **COVID-19** | | | | |
| **Measure** | **Source** | **Most Recent Year Available** | **Technical Notes** | |
| COVID-19 Cases | Colorado Department of Public Health and Environment  <https://covid19.colorado.gov/covid-19-data>  CDPHE COVID19 County-Level Open Data Repository  https://data-cdphe.opendata.arcgis.com/datasets/cdphe-covid19-county-level-open-data-repository | Current  Updated Weekly | Total cases  Cumulative per 100,000 population  Past 7-day count  Past 7-day rate per 100,000 population  Past 14-day count  Past 14-day rate per 100,000 population | tot\_COVID\_cases  covid\_cumu\_case\_rate\_100000  COVID\_7\_day\_cases  covid\_past\_7d\_case\_rate\_100000  COVID\_14\_day\_cases  covid\_past\_14d\_case\_rate\_100000 |
| COVID-19 Hospitalizations | Total hospitalizations  Cumulative per 100,000 population  Past 7-day count  Past 7-day rate per 100,000 population  Past 14-day count  Past 14-day rate per 100,000 population | tot\_COVID\_hosp  covid\_cumu\_hosp\_rate\_100000  COVID\_7\_day\_hosp  covid\_past\_7d\_hosp\_rate\_100000  COVID\_14\_day\_hosp  covid\_past\_14d\_hosp\_rate\_100000 |
| COVID-19 Deaths | Total Deaths  Cumulative per 100,000 population  Past 14-day count  Past 14-day rate per 100,000 population | tot\_COVID\_deaths  covid\_cumu\_death\_rate\_100000  COVID\_14\_day\_deaths  covid\_past\_14d\_death\_rate\_100000 |
| COVID-19 Testing | Cumulative per 100,000 population  Past 7-day count  Past 7-day count and rate per 100,000 population  Past 14-day count  Past 14-day count and rate per 100,000 population  *Includes only tests from labs that participate in electronic lab reporting: PCR and serology.*  *Individuals with serology-positive tests are not included in daily case counts until they are confirmed to have had COVID-like symptoms.* | covid\_test\_rate\_100000  COVID\_7\_day\_test  covid\_past\_7d\_test\_rate\_100000  COVID\_14\_day\_test  covid\_past\_14d\_test\_rate\_100000 |
| Positivity Rate |  |  | Past 7-day positivity rate  Past 14-day positivity rate  **Formula:**  **Positivity Rate (% Positive) =** Positive PCR Tests + Positive Serology Tests) / (Total PCR Tests + Total Serology Tests) | covid\_7\_day\_pos\_rate  covid\_14\_day\_pos\_rate |
| COVID-19 Vulnerability | (for calculating index) Hospital Cost Utilization Project: State Inpatient Database <https://www.hcup-us.ahrq.gov/sidoverview.jsp>  CIVHC (Center for Improving Value in Health Care) - <https://www.civhc.org/get-data/co-apcd-overview/> | 2017 | <https://www.medrxiv.org/content/10.1101/2020.03.16.20036723v2.full.pdf>  <https://www.nber.org/papers/w27294>  <https://www.medrxiv.org/content/10.1101/2020.05.05.20092262v1>  <https://www.hcup-us.ahrq.gov/toolssoftware/ccsr/ccs_refined.jsp#archives1>  <https://www.hcup-us.ahrq.gov/toolssoftware/ccsr/ccsr_archive.jsp#ccsr> | Waiting for meeting with CIVHC on 07/22 to see if we can use recent claims data to calculate this index.  This means we will be able to use COVID-19 as a diagnosis, instead of proxy conditions (e.g., flu, acute respiratory disease, etc).  This will be added in the next iteration of the dataset. |
| Flu Immunization Rate (adults) | Colorado Department of Public Health and Environment (CDPHE): CO Behavioral Risk Factor Surveillance System (2014-17)  <https://data-cdphe.opendata.arcgis.com/datasets/67162a5356d4438aa0f099ca7c43bac0_14>  County Health Rankings  <https://www.countyhealthrankings.org/explore-health-rankings/rankings-data-documentation> | 2017 | CDPHE – influenza immunization rate estimates for adults 18+ | flu\_vac\_adult\_rate |
| Child and Teen Immunization Rate | CDPHE  <https://www.colorado.gov/pacific/cdphe/ciiscountylevel> | 2019 |  | TBD |

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| **Cellular Phone Data (Mobility Data)** | | | | |
| **Measure** | **Source** | **Most Recent Year Available** | **Technical Notes** | |
| Human Mobility | SafeGraph (Provided by IRVOL team) | Current  Updated Weekly (for website) | County-level human mobility data:  relative\_mobility  stay\_at\_home\_index | Ranges from 0 (everyone is home all the time) to 100 (pre-COVID levels of staying at home) to theoretically infinitely high, though in practice it rarely goes over 200.  Ranges from -100 (no one is ever home) to 0 (pre-COVID levels) to 100 (everyone is home all the time).  Future mobility indices to be included: exposure risk and visitation to businesses |