# Colorado COVID-19 Response

## distribution model for the allocation of limited availability therapeutics

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December 16, 2020

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# Principles for Allocation: Colorado Model

**COVID-19 therapeutic distribution model**

**1. Geographic Distribution:** to assure access for all Coloradans.

**2. Balance by need:** regions with higher risk or higher cases should receive more doses.

**3. Equitable access:** random allocator tool if more cases than doses.

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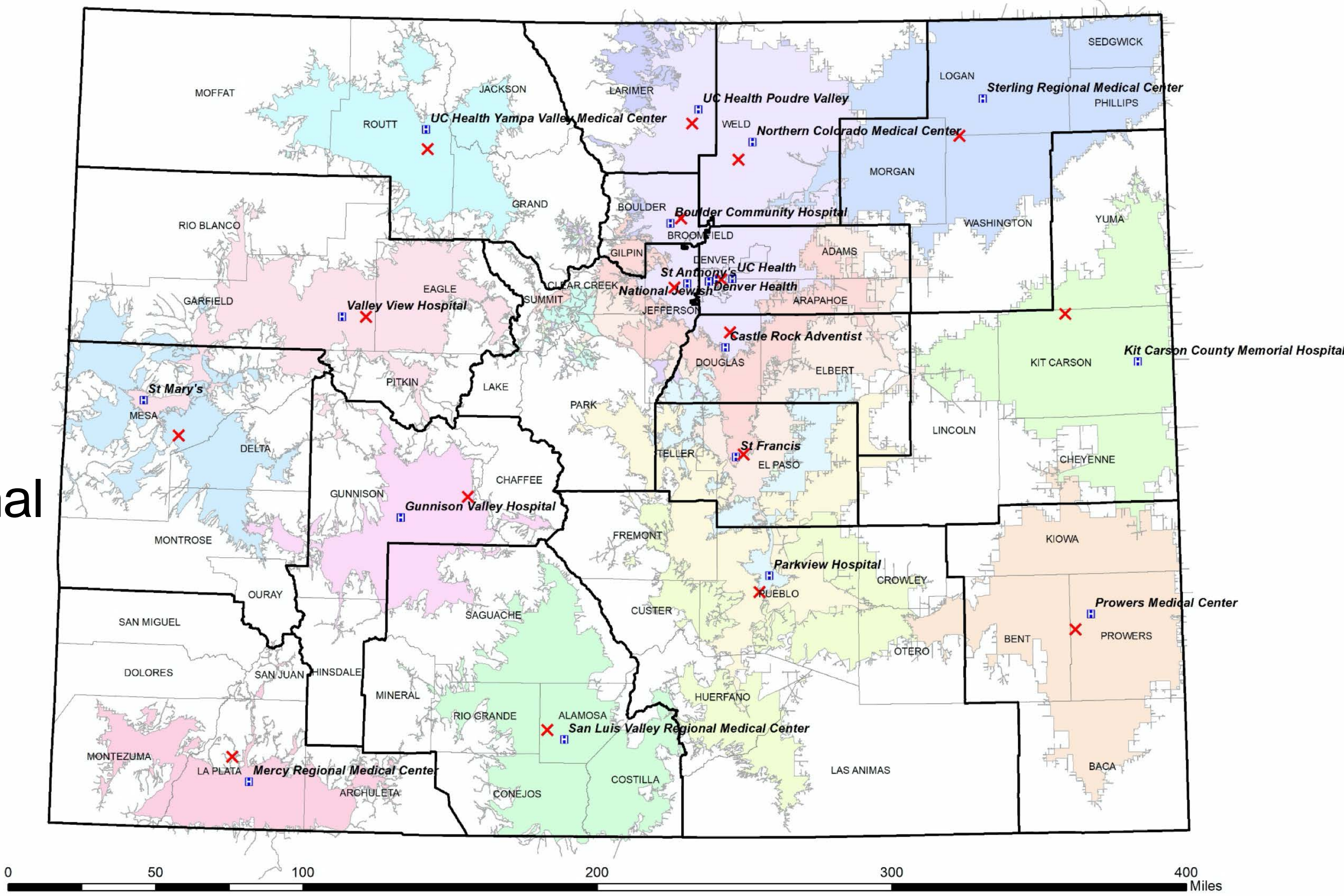
# Catchment Area Model

**COVID-19 therapeutic distribution model**



catchment area boundary

90 minute one-way road travel time polygon from selected site

current or proposed optimal infusion site

population weighted road travel centroid

# Catchment Area Model

**COVID-19 therapeutic distribution model**

These proposed catchment areas with the established or candidate infusion center sites result in **>98% being able to access one or more sites within 90 minutes** travel time from home.

- 5,423,662 cumulative population inside a 90 minute travel polygon

- 107,479 cumulative population outside a 90 minute travel polygon

2014-2018 pop estimates



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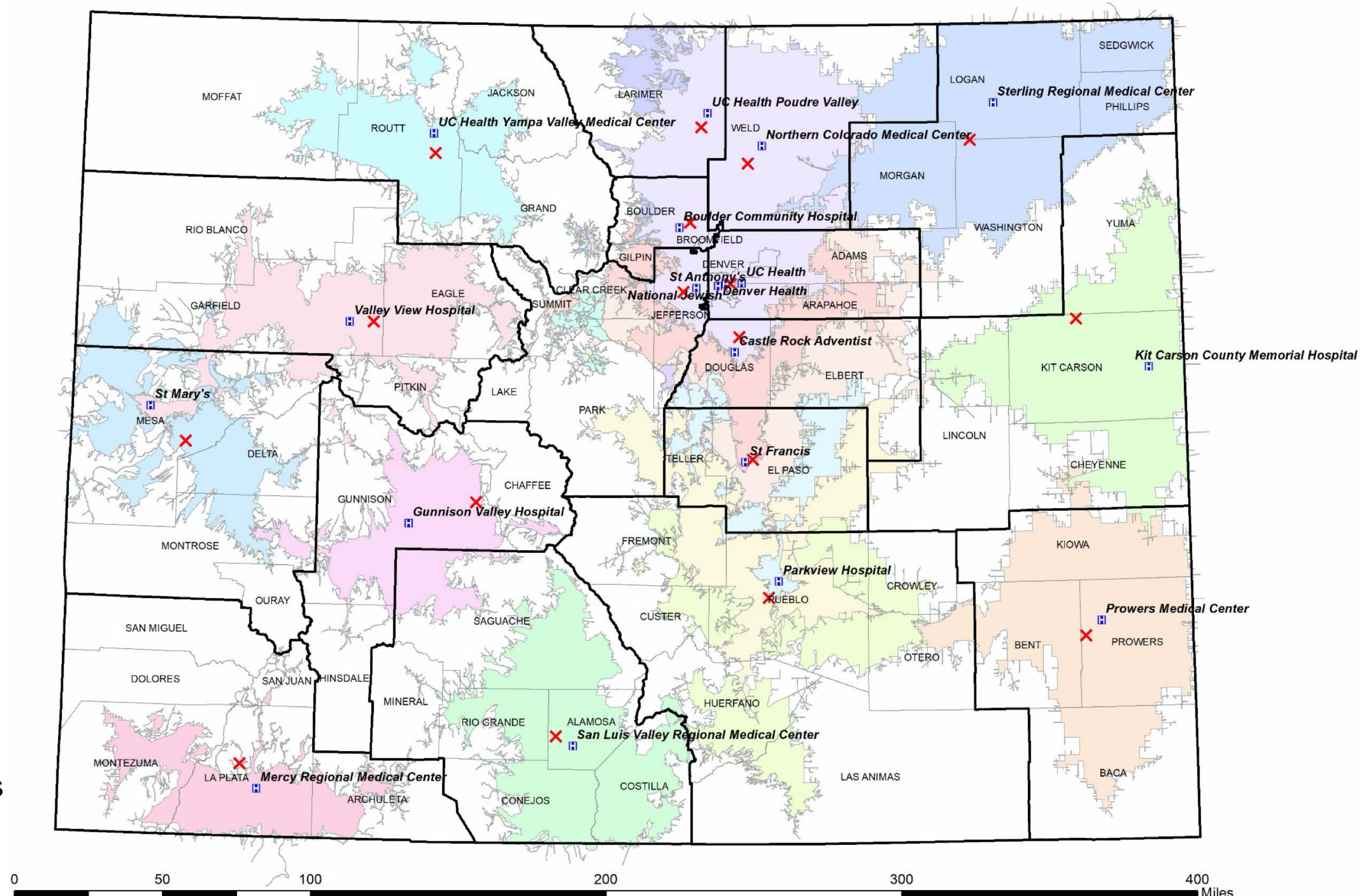
# Design Steps

**COVID-19 therapeutic distribution model**

**3. Tranche** each therapeutic allocation to each catchment area according to 1) risk index and 2) new infections.

- Measure the **proportion of COVID-19 risk** in each catchment area relative to proportion of COVID-19 risk statewide using a multivariant analysis of putative risk factors for COVID-19 complications.

- Measure the **proportion of new COVID-19 infections** over the previous 14 day period in each catchment area relative to the total new infections in the state.

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# Tranche Method

**COVID-19 therapeutic distribution model**

$$\text{Catchment area percent of therapeutic allocation} = \frac{(\text{proportional risk index burden x proportion of new infections over previous 14 day period})}{2}$$

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# Proportion of COVID-19 Risk Model

**COVID-19 therapeutic distribution model**

## Demographic Indicators

- Age: 50+, 65+, 50-64 and 65+

- Crowding

- Income: 125%, 200% and 300% of Federal Poverty Level

- Race and Ethnicity

- Sex

## Health Status Indicators

- Asthma

- Cancer

- Chronic kidney disease

- Chronic Obstructive Pulmonary Disease

- Heart disease

- Hypertension

- Immunocompromised state from solid organ transplant

- Obesity (BMI of 30 or higher)

- Sickle cell disease

- Smoking

- Type 2 diabetes

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# Proportion of COVID-19 Risk Model

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- Age: ~~50+, 65+, 50-64 and~~ **65+**

- ~~Crowding~~

- Income: ~~125%,~~ **200%** ~~and 300%~~ **of Federal Poverty Level**

- ~~Race and Ethnicity~~ **-> Hispanic**

- ~~Sex~~ **-> Male**

## Health Status Indicators

- ~~Asthma~~

- ~~Cancer~~

- ~~Chronic kidney disease~~

- **Chronic Obstructive Pulmonary Disease**

- **Heart disease**

- ~~Hypertension~~

- ~~Immunocompromised state from solid organ transplant~~

- **Obesity** (BMI of 30 or higher)

- ~~Sickle cell disease~~

- ~~Smoking~~

- **Type 2 diabetes**

# Tranche Results

COVID-19 therapeutic distribution model

| Distribution Center | Catchment Area Population | Proportion of 14-Day Infections | Proportion of Risk Burden | Allocation |
|---|---|---|---|---|
| Craig/Steamboat Springs | 56,005 | 0.82% | 1.01% | 0.91% |
| Fort Collins | 356,938 | 4.95% | 6.25% | 5.60% |
| Greeley | 323,763 | 5.76% | 5.18% | 5.47% |
| Sterling | 62,147 | 1.51% | 1.18% | 1.34% |
| Boulder | 404,141 | 4.13% | 6.98% | 5.55% |
| Glenwood Springs | 139,301 | 2.49% | 2.40% | 2.44% |
| Wheatridge | 488,047 | 7.41% | 8.55% | 7.98% |
| Denver West | 405,762 | 5.88% | 7.16% | 6.52% |
| Denver East | 389,918 | 5.99% | 6.78% | 6.39% |
| Denver Central | 389,918 | 5.99% | 6.78% | 6.39% |
| Aurora North | 440,515 | 7.75% | 7.43% | 7.59% |
| Aurora South | 440,515 | 7.75% | 7.43% | 7.59% |
| Grand Junction | 233,805 | 4.59% | 4.41% | 4.50% |
| Highlands Ranch | 378,214 | 5.29% | 5.56% | 5.42% |
| Burlington | 24,708 | 1.24% | 0.48% | 0.86% |
| Gunnison | 38,675 | 0.44% | 0.73% | 0.59% |
| Colorado Springs | 747,848 | 14.95% | 12.88% | 13.92% |
| Pueblo | 266,474 | 9.19% | 5.41% | 7.30% |
| Lamar | 22,871 | 1.32% | 0.47% | 0.90% |
| Durango | 107,371 | 1.93% | 1.99% | 1.96% |
| Alamosa | 47,040 | 0.62% | 0.94% | 0.78% |

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# Random Allocator

CDPHE

# Random Allocator

CDPHE

# Challenges

CDPHE

- We need more infusion sites.  Standing up a site takes time.

  - Random allocation based on infusion seats vs. therapeutic doses?

- Care delivery systems are saying "no thank you":

  - Hospital and staff are busy with COVID-19 patients

  - Pediatrics: none in the state.  Children's hospital not interested: no data

- State resources: Project manager, data person, communications plan, CMO oversight, GIS & RedCAP programming.

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**December 16, 2020**

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