THE COVID-19 EPIDEMIC CURVE FOR COLORADO AND DENVER

Prepared by the COVID-19 Modeling Group

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Table showing estimated timing of the peak number of infections and peak number of hospitalizations as well as the cumulative number of deaths, non-ICU and ICU hospitalizations. **Model assumes social distancing begins March 17 at 50% efficacy and then is changed on March 26th to varying efficacies shown in the table and remains in place indefinitely.** Estimates are generated for R0 = 3.5 and R0 = 4.

Some parameter values have changed since previous estimates to allow the model to better approximate the current case data.

	Peak Infections		Peak non-ICU hospitalizations***		Peak ICU hospitalizations		Cumulative deaths**		Cumulative non-ICU hospitalizations		Cumulative ICU bed need***	
	Num.*	Date	Num.*	Date	Num*	Date	As of 6/1/2020	As of 1/1/2021	As of 6/1/2020	As of 1/1/2021	As of 6/1/2020	As of 1/1/2021
R0 = 3.5												
0% SD	826,132	5/22/2020	51,195	5/29/2020	13,217	6/4/2020	23,881	37,254	192,984	281,854	37,984	74,509
40% SD	364,450	7/11/2020	24,261	7/18/2020	7,057	7/26/2020	1,244	30,299	19,980	229,473	3,885	60,628
50% SD	214,784	8/16/2020	14,570	8/24/2020	4,443	9/2/2020	572	24,787	7,939	189,904	1,621	49,887
60% SD	70,838	11/14/2020	4,881	11/22/2020	1,568	12/2/2020	276	10,054	3,198	87,028	699	21,557
80% SD	2,016	11/22/2020	121	3/30/2020	31	4/8/2020	95	116	807	881	201	233
R0 = 4												
0% SD	941,312	5/7/2020	57,086	5/14/2020	14,362	5/19/2020	33,237	37,978	263,774	287,327	57,822	75,956
40% SD	484,054	6/7/2020	31,686	6/14/2020	8,909	6/22/2020	10,790	33,006	93,946	249,733	18,471	66,014
50% SD	323,840	6/27/2020	21,671	7/5/2020	6,383	7/13/2020	3,995	29,143	42,541	220,658	8,511	58,308
60% SD	152,650	8/6/2020	10,430	8/14/2020	3,250	8/23/2020	1,277	21,494	16,187	165,044	3,416	43,309
80% SD	6,523	8/23/2020	394	4/1/2020	103	4/12/2020	330	459	2,909	3,476	715	919

*Number of infections, non-ICU hospitalizations and ICU hospitalizations at the peak date indicated.

**We assume 50% of cases in the ICU die which is consistent with Ferguson et al and roughly the mortality of ARDs cases, generally. Additionally, we assume that once available ICU beds are full, all cases requiring ICU in excess of availability result in deaths. Cumulative death estimate assumes the number of available beds in the ICU is 709 which is 50% of current total ICU beds until 4/21/2020. We assume there are 1,709 available beds 4/22 (corresponding with an addition of 1,000 beds) and 4,291 available beds as of 6/21/2020 (5000 total available beds.

***Peak and cumulative ICU hospitalizations is the estimated number of needed ICU beds. These may be in excess of capacity at peak times.

We fit the model using least squares regression based on case data though 3/24/2020 based on date received from CDPHE on 3/31/2020. Because of lags in reporting test results, the most recent 5 days are not used for model fitting. In the fitted model, the following assumptions have been updated:

- Start date of introduction of infection to CO has been changed from 1/21 to 1/28
- The proportion of symptomatic individuals is: 0.73
- The ratio of infectiousness for symptomatic to asymptomatic individuals: 1.2
- The proportion of symptomatic individuals that self-isolate has been estimate: 0.26
- The proportion of symptomatic infections detected: 0.19

Estimates for cumulative number of deaths and hospitalizations as of 6/1 is sensitive to the assumed start date of the outbreak. This updated model fit pushes the start date out by one week, which leads to a modestly later peak of infections and therefore a lower number of cummulative deaths and hospitalizations by 6/1.