

Excess mortality in Himachal Pradesh during the COVID-19 pandemic: A factsheet¹

What death registration data is available?

Monthly deaths registered in Himachal Pradesh's online civil registration system, from January 2018 to May 2021, and broken down by gender, are [available on github](#). The data was reported in [The Hindu](#). The data is recorded according to date of occurrence.

What do we know about delays in registration?

According to the [2019 CRS report](#), 92% of registrations occurred within 21 days, and 96% within 30 days. Registration was thus prompt in pre-pandemic times.

What do we know about registration coverage and trends in the state/within this system?

According to the 2019 CRS report, during 2015, 2016, 2017, 2018 and 2019, estimated registration coverage in the state was 88%, 73%, 82%, 83% and 86% respectively. [According to NFHS-5](#), however, registration levels were 94% during the three years prior to the NFHS (which was conducted between July 2019 and November 2019 in the state). This is higher than the 84% average over 2017-19 and 81% average over 2016-19 implied by the SRS-CRS data. This suggests that the CRS-SRS based estimates may underestimate death registration in the state.

The online system captured 80% and 81% of estimated total deaths during 2018 and 2019 respectively. Thus, there is very little increase in coverage of estimated total deaths in the online system between 2018 and 2019. 2019 data shows no significant trends in registered deaths.

Are there risks of bias in using this data?

While registration appears to be quite robust, the incomplete and uncertain coverage poses some risks. Significant negative excesses during the early months of 2021 raise the possibility that there might have been drops in registration coverage during this period. Second wave excess mortality is also very likely incomplete in the available data.

Were there unusual fluctuations in registration during the early part of 2020?

Registered deaths during February to April 2020 were 8% fewer than in the same period during 2019, and registered deaths during February to July 2020 were 5% fewer than in the same period during 2019, suggesting that there may have been drops in registration coverage during the lockdown and pandemic. Registered deaths during January-April 2020 were 5% fewer than the average over the same period during 2018 and 2019.

What are possible choices for baseline deaths and hence excess deaths?

We can choose 2019 values or averages of 2018-19 values, possibly scaled for drops in registration and for coverage in the online system.

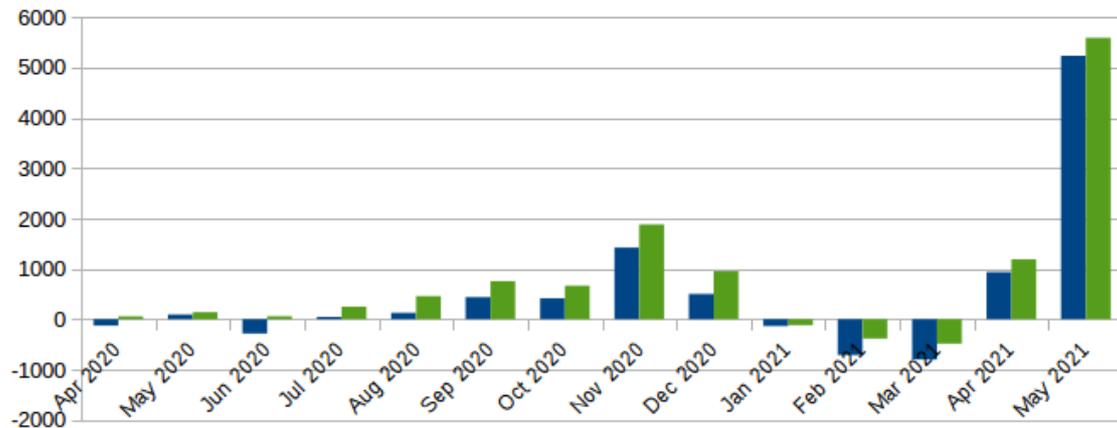
What do monthly excess deaths look like relative to various baselines?

Below is a plot of excess deaths during March 2020 to May 2021, relative to two different baselines: 2019 and the average of 2018-19 reduced by 5% (see above).

¹ Prepared on 22nd August 2021, by Murad Banaji and Aashish Gupta.

Himachal Pradesh: excess deaths relative to two baselines

(2019 (blue) and adjusted 2018-19 (green))



What is the scale of first and second wave excess deaths relative to various baselines?

We have the following estimates (official COVID-19 deaths are from covid19india.org):

	excess deaths (to nearest 1000)		excess deaths per 1000 population		surge relative to baseline		ratio of excess deaths to official COVID-19 deaths	
	2019 baseline	adjusted 2018-19 baseline	2019 baseline	adjusted 2018-19 baseline	2019 baseline	adjusted 2018-19 baseline	2019 baseline	adjusted 2018-19 baseline
Apr 2020-Feb 2021	2	5	0.2	0.6	4%	10%	1.8	4.8
March-May 2021	5	6	0.7	0.8	45%	52%	2.5	2.9
Apr 2020-May 2021	7	11	1.0	1.5	12%	19%	2.3	3.5

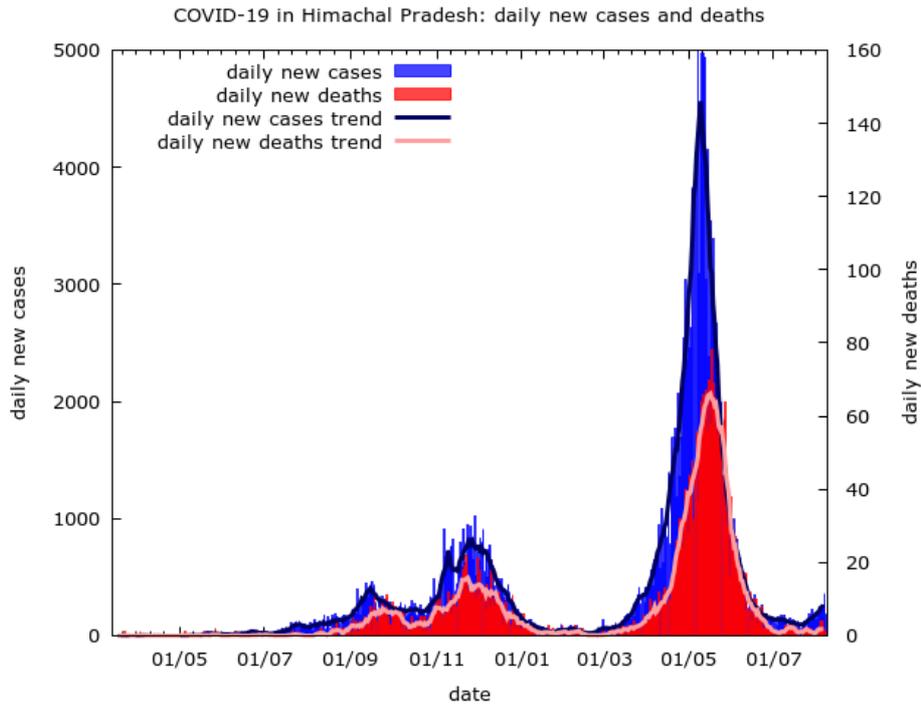
Relative to a 2019 baseline, it appears that the second wave of the pandemic hit much harder than the first. However relative to an adjusted 2018-19 baseline, the two waves appear more even.

Are there other notable features in the death registration data?

With both baselines we see significant negative excess deaths during January-March 2021, suggesting that there may have been greater drops in registration than assumed in either scenario.

What are the broad features of the state's COVID-19 epidemic so far?

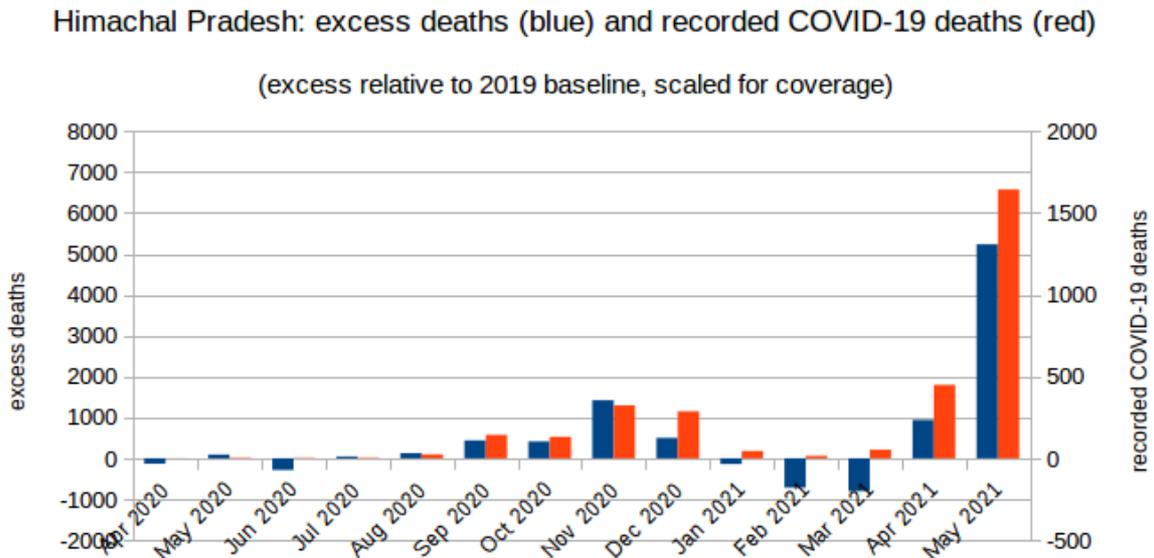
The trajectory of recorded COVID-19 cases and deaths, using data from covid19india.org, is shown below.



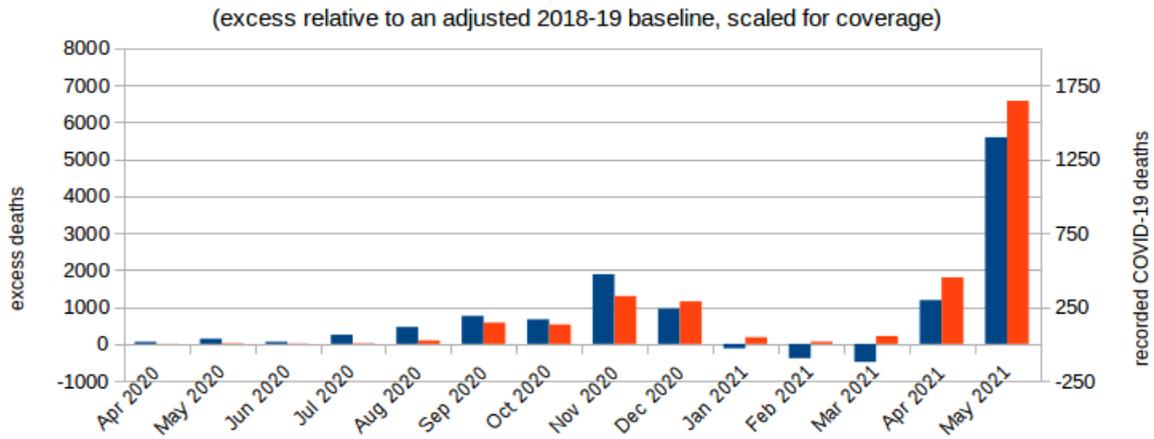
The state saw a late first wave peak, at around 820 daily cases, around November 27, 2020; and a second wave perak, at around 4600 daily cases, around May 10, 2021.

How does the mortality data align with official COVID-19 data?

Excess deaths relative to the two different baselines (scaled for coverage), alongside recorded COVID-19 deaths (from covid19india.org) are plotted below.



Himachal Pradesh: excess deaths (blue) and recorded COVID-19 deaths (red)



Relative to a 2019 baseline: there is a good correlation (correlation coefficient: 0.84) during April 2020 to February 2021 between monthly recorded COVID-19 deaths and monthly excess mortality. This rises to 0.97 if we consider the whole period between April 2020 and May 2021.

Relative to an adjusted 2018-19 baseline: there is a better correlation (correlation coefficient: 0.89) during April 2020 to February 2021 between monthly recorded COVID-19 deaths and monthly excess mortality. This, again, rises to 0.97 if we consider the whole period between April 2020 and May 2021.

Other notes

Data on both recorded COVID-19 deaths and excess deaths are in agreement that Himachal Pradesh saw a relatively late first wave with the majority of 2020 excess mortality coming in the last four months of the year. Negative excesses in early 2021 hint that registration may have suffered as a consequence of the pandemic, leading to underestimation of excess mortality even after factoring in a 5% drop in registration coverage relative to the 2018-19 average.