

Additional file 3. Model Test inputs using the actual COVID-19 cases for 2020. This file shows the inputs and results used for the DALY model test

Table 1. Model tests input using the Actual COVID-19 cases from January 2020- January 2021

Health States	Rates (Sensitivity analysis)	Duration (Sensitivity Analysis)	DW (Uncertainty Analysis)
Asymptomatic	17% of the moderate cases[1]	Nil	Nil
Moderate	71.0% (Increased to 5% and 10%) to the whole Australian COVID-19 case[2, 3]	14 days (28 days)[4-6]	0.051 (0.032 – 0.074)*[7, 8]
Severe	10.1% (Increased to 5% and 10%) to the whole Australian COVID-19 case[2, 3]	14 days (28 days)[4-6]	0.133 (0.088 – 0.190)*[7, 8]
Critical	1.9% (Increased to 5% and 10%) to the whole Australian COVID-19 case[2, 3]	14 days (28 days)[4-6]	0.655 (0.579 – 0.727)*[7, 8]
Post-acute consequences (ONS)	Start at 25.91% (23.2% to 29.0%) 2 weeks after initial COVID infection[9]	14 days to 2 years (28 days to 2 years) (assumed)	0.219 (0.148-0.308)[7, 8]
Post-acute consequences (NSW)	Start at 33.60% (33.0% to 34.0%) 2 weeks after initial COVID infection[10]	14 days to 2 years (28 days to 2 years) (assumed)	0.219 (0.148-0.308)[7, 8]
Post-Intensive Care Syndrome (PICS)	90.6% of ICU survivors[11]	14 days (28 days) to remaining lifetime expectancy[12, 13]	0.224 (0.151-0.312)* (a)[14, 15]
Permanent disability health states	Same as additional file 2 Table 4		

Table 2. Actual COVID-19 cases

Actual COVID-19 reported cases between January 2020 to 17 January 2021					
Age Group	Cumulative Cases				
	Cases			Number of Death	Cases without death
	Male	Female	People	People	People
0 to 9	792	711	1,503	0	1,503
10 to 19	1,254	1,197	2,451	0	2,451
20 to 29	3,067	3,366	6,455	1	6,454
30 to 39	2,587	2,493	5,095	2	5,093
40 to 49	1,890	1,788	3,706	2	3,704
50 to 59	1,647	1,741	3,396	15	3,381
60 to 69	1,199	1,220	2,421	38	2,383
70 to 79	856	756	1,612	157	1,455
80 to 89	495	780	1,275	379	896
90 and over	229	552	782	315	467
All	14,016	14,604	28,696	909	27,787

Source: COVID-19 Australia: Epidemiology Report 33 Fortnightly reporting period ending 17 January 202 and Department of Health COVID-19 case number and statistics 1[2, 16]

Model Test Results

Briefly, from January 2020 to January 2021, there were 28,696 cases and 909 deaths due to COVID-19 in Australia [2]. During this period, total base case burden of 8,855 (95%CI: 8,471-9,267) was estimated. Including the permanent functional impairment, a potential 12,467(95%CI: 12,039-12,903) was modelled arising from the 2020 COVID-19 outbreak (see Table 3).

Varying acute illness by up to 5% and 10% increase from baseline, did not meaningfully affect the results, with a total DALY of 12,469 (95%CI: 12,027-12,914) and 12,470 (95%CI: 12,034-12,939) respectively (Tables 4 and 5). Varying estimates of post-acute burden using NSW data, led YLDs to decrease from 565 to 361 compared to the baseline, but with a relatively small impact on total DALYs (12,269 (95%CI: 11,867-12,687)). Table 7 shows the result of the model when assumed recovery duration in the symptomatic phase increased from 14 to 28 days, the symptomatic YLD increased from 69 (95%CI:52-88) to 137 (95%CI:105-176), with only a small impact on total DALYs (12,514 (95%CI: 12,080-12,968)) compared to baseline DALY loss.

Table 3. DALYS Baseline Results (Using ONS Long COVID data points)

Variable	Mean	LCI 95%	HCI 95%
YLL	7,263.49	*	*
Symptomatic	68.53	52.38	87.68
Post-acute	564.92	375.16	791.60
PICS	958.35	635.52	1,322.12
Permanent functional impairment with D	3,611.31	3,444.61	3,794.39
Permanent functional impairment WOD	3,400.56	3,233.60	3,582.53
TOTAL YLD Baseline	1,591.80	1,207.41	2,003.45
TOTAL YLD with Diabetes	5,203.12	4,775.39	5,639.72
TOTAL YLD without Diabetes	4,992.36	4,569.16	5,431.28
TOTAL DALYS Baseline	8,855.29	8,470.90	9,266.93
Total DALYs with Diabetes	12,466.60	12,038.88	12,903.21
Total DALYs without Diabetes	12,255.85	11,832.64	12,694.77

*Note: YLL=Years of life lost, YLD= years lived with disability, UI= Uncertainty intervals, LCI= lower confidence interval, HCI= higher confidence interval, *= not applicable, PICS= post-intensive care syndrome, DALYs= Disability-adjusted life years*

Table 4. Sensitivity analysis: Results when symptomatic cases were increased to 5%

Variable	Mean	LCI 95%	HCI 95%
YLL	7,263.49	*	*
Symptomatic	72.40	56.14	93.33
Post-acute	563.36	362.85	796.72
PICS	957.28	638.12	1,326.23
Permanent functional impairment with D	3,612.53	3,441.50	3,793.19
Permanent functional impairment WOD	3,401.69	3,230.35	3,579.31
TOTAL YLD Baseline	1,593.03	1,198.36	2,006.69
TOTAL YLD with Diabetes	5,205.57	4,763.92	5,650.71
TOTAL YLD without Diabetes	4,994.72	4,557.60	5,442.79
TOTAL DALYs Baseline	8,856.52	8,461.85	9,270.17
Total DALYs with Diabetes	12,469.05	12,027.40	12,914.19
Total DALYs without Diabetes	12,258.20	11,821.09	12,706.28

Note: YLL=Years of life lost, YLD= years lived with disability, UI= Uncertainty intervals, LCI= lower confidence interval, HCI= higher confidence interval, * = not applicable, PICS= post-intensive care syndrome, DALYs= Disability-adjusted life years

Table 5. Results when symptomatic cases were increased to 10%

Variable	Mean	LCI 95%	HCI 95%
YLL	7,263.49		
Symptomatic	75.31	58.21	96.05
Post-acute	564.35	368.01	789.48
PICS	955.36	623.78	1,324.47
Permanent functional impairment with D	3,611.92	3,434.42	3,784.60
Permanent functional impairment WOD	3,401.20	3,228.68	3,575.30
TOTAL YLD Baseline	1,595.03	1,204.86	2,025.52
TOTAL YLD with Diabetes	5,206.95	4,770.86	5,675.23
TOTAL YLD without Diabetes	4,996.23	4,562.09	5,457.33
TOTAL DALYS Baseline	8,858.51	8,468.35	9,289.00
Total DALYs with Diabetes	12,470.43	12,034.35	12,938.71
Total DALYs without Diabetes	12,259.71	11,825.58	12,720.82

*Note: YLL=Years of life lost, YLD= years lived with disability, UI= Uncertainty intervals, LCI= lower confidence interval, HCI= higher confidence interval, * = not applicable, PICS= post-intensive care syndrome, DALYs= Disability-adjusted life years*

Table 6. Results when NSW was used in the post-acute consequence health state

Variable	Mean	LCI 95%	HCI 95%
YLL	7,263.49		
Symptomatic	68.34	52.07	86.69
Post-acute	360.67	236.06	506.96
PICS	961.42	642.22	1,317.82
Permanent functional impairment with D	3,614.89	3,440.59	3,794.41
Permanent functional impairment WOD	3,403.66	3,231.03	3,583.29
TOTAL YLD Baseline	1,390.42	1,024.35	1,775.30
TOTAL YLD with Diabetes	5,005.31	4,603.13	5,423.67
TOTAL YLD without Diabetes	4,794.09	4,392.12	5,211.63
TOTAL DALYs Baseline	8,653.91	8,287.84	9,038.78
Total DALYs with Diabetes	12,268.80	11,866.61	12,687.15
Total DALYs without Diabetes	12,057.57	11,655.61	12,475.11

*Note: YLL=Years of life lost, YLD= years lived with disability, UI= Uncertainty intervals, LCI= lower confidence interval, HCI= higher confidence interval, * = not applicable, PICS= post-intensive care syndrome, DALYs= Disability-adjusted life years*

Table 7. Results when 28-day symptomatic recovery duration was used

Variable	Mean	LCI 95%	HCI 95%
YLL	7,263.49	*	*
Symptomatic	136.92	104.95	175.91
Post-acute	549.21	362.09	750.60
PICS	952.00	628.80	1,300.68
Permanent functional impairment with D	3,612.65	3,444.80	3,790.31
Permanent functional impairment WOD	3,401.62	3,235.69	3,575.68
TOTAL YLD Baseline	1,638.13	1,253.81	2,051.73
TOTAL YLD with Diabetes	5,250.78	4,816.26	5,704.92
TOTAL YLD without Diabetes	5,039.74	4,609.23	5,500.78
TOTAL DALYs Baseline	8,901.61	8,517.29	9,315.22
Total DALYs with Diabetes	12,514.26	12,079.74	12,968.40
Total DALYs without Diabetes	12,303.23	11,872.71	12,764.26

*Note: YLL=Years of life lost, YLD= years lived with disability, UI= Uncertainty intervals, LCI= lower confidence interval, HCI= higher confidence interval, * = not applicable, PICS= post-intensive care syndrome, DALYs= Disability-adjusted life years*

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