Appendix

1. Data retrieval and post-processing

We utilise the Twitter academic full track application programming interface (AFT-API) to search and retrieve geotweets in Australia. Compared to the normal Twitter API which returns 1% of the total tweets for the data privacy purpose, AFT-API enables us to fully retrieve tweets with the pre-defined queries and improve the data coverage and representativeness.[18] We defined the searching terms as *"pandemic, epidemic, virus, covid*, coronavirus, corona, and vaccin*"*; the search timespan was defined as from January 1, 2020 to May 31, 2021 with the country defined as *"AU"* (Australia). Consequently, 244,406 geotweets were retrieved from the total +860 million tweets in Australia. These geotweets contain two types of location information at the individual level and place level: 1) an accurate pair of X, Y coordinates of a place where a geotweet was posted if a user activated the location function in Twitter, and 2) the name of a place (e.g., a suburb) which has been further assigned the X, Y coordinates as the centroid of the place.

2. Methods

2.1 Sentimental analysis

We implemented the <u>V</u>alence <u>A</u>ware <u>D</u>ictionary for s<u>E</u>ntiment <u>R</u>easoning (VADER) model, a lexicon and rule-based sentiment analysis tool that has been specifically attuned to sentiments expressed in microblog-like contexts, such as social media posts.[22] The VADER text sentiment analysis combines lexical features and five simple heuristics and utilizes a human-centric approach via the combination of qualitative analysis and empirical validation using human raters, i.e., the wisdom of the crowd.[22] VADER returns four scores, i.e., positive, negative, neutral, and compound. Scores for positive, negative, neural are ratios for proportions of text that fall in these three categories, respectively. The compound, on the other hand, is a weighted composite score that sums the valence scores of each word in the lexicon with a normalized value range between -1 (most extreme negative) and +1 (most extreme positive). In this study, we used the compound score as the mental health signals. The VADER library is open-sourced at https://github.com/cjhutto/vaderSentiment. Before the sentimental analysis, we applied lemmatization, a technique that identifies the inflected forms of a word and returns its base form (e.g., "better" is lemmatized as "good"). Regular expression was implemented to match and remove URLs and characters following "@" in their texts. In addition, we applied basic transformations, such as "'ve" to "have", "n't" to "not", "'re" to "are, etc., aiming to further enhance the comprehension of the algorithm. Considering that the VADER algorithm recognizes the influence of capitalization, emoticons, and certain punctuations on sentiments, we kept them in this step.

2.2 Emotion analysis

We then implemented <u>N</u>ational <u>R</u>esearch <u>C</u>ouncil Canada Emotional <u>Lex</u>icon (NRCLex),[23] a Massachusetts Institute of Technology-approved *PyPI* model (open-sourced at https://pypi.org/project/NRCLex/) that predicts the sentiments and emotion of a given text by documenting a list of English words and their associations with four pairs of primary bipolar emotions (i.e., eight basic emotions): joy (feeling happy) versus sadness (feeling sad); anger (feeling angry) versus fear (feeling of being afraid); trust (stronger admiration and weaker acceptance) versus disgust (feeling something is wrong or nasty); and surprise (being unprepared for something) versus anticipation (looking forward positively to something).[7] The affection dictionary of NRCLex contains approximately 27,000 words and is based on the National Research Council Canada lexicon and the <u>N</u>atural <u>L</u>anguage <u>T</u>ool<u>K</u>it (NLTK) library's WordNet synonym sets.[23] The annotations in NRCLex are manually completed via crowdsourcing. As NRCLex is based on a word matching mechanism, no preprocessing step is involved besides the removal of links and characters following "@" using regular expressions. We further group the eight types of emotions to two types of mental health signals: fear, sadness, anger, and disgust to represent pessimistic mental health signals, and joy, anticipation, trust, and surprise to represent optimistic mental health signals.

2.3 Word cloud mapping

We presented the frequencies of keywords mentioned in Twitter via WordCloud, a graphical representation of word frequency that gives greater prominence to words that appear more frequently mentioned in source texts.[24] In this study, we divided the geotweets into four phases with two different mental health signals (i.e., optimistic and pessimistic) and visualize the word cloud by phase and by mental signal. Besides the preprocessing steps before the sentimental analysis, we further decapitalized words, removed punctuations and numbers, and removed words documented in the build-in stopword list in Table A1. In addition, we removed the words of "covid", "covid-19",

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"virus", "coronavirus", "coronaviru", "corona", "pandemic", "epidemic", "people", given their ubiquitous occurrence in all phases but providing limited contextual information.

Table A1. Wordcloud built-in stopwords

'between', 'cannot', 'against', 'in', "don't", 'not', 'here', 'nor', "shan't", 'than', 'your', 'about', 'com', 'herself', 'again', 'does', 'further', 'otherwise', 'their', 'these', "wouldn't", 'where', "hadn't", 'myself', 'would', "why's", 'only', "they'd", "hasn't", 'so', 'she', "she's", 'all', 'own', 'like', 'for', 'to', "i'll", 'was', 'whom', "how's", 'her', 'because', 'therefore', 'him', 'as', 'ourselves', 'me', 'can', 'himself', 'or', 'r', "haven't", 'themselves', 'am', 'the', 'them', 'ever', 'doing', 'by', 'http', 'most', 'who', "they've", "you'd", 'are', 'over', 'if', 'k', 'other', "we've", "they're", 'this', 'get', 'same', 'before', 'had', 'yourselves', "he'll", 'should', 'when', "mustn't", 'shall', "isn't", 'above', 'ours', 'there', 'some', 'do', 'has', 'however', "we're", 'which', "i'd", "here's", 'it', 'out', 'is', 'no', 'www', 'while', "we'll", "doesn't", "when's", 'at', 'itself', "let's", 'hence', 'my', "where's", "we'd", 'did', 'few', "it's", 'i', 'ought', 'else', "can't", 'then', 'you', "you've", "couldn't", 'hers', 'a', 'theirs', 'and', 'how', "you're", 'they', 'being', 'very', "that's", 'any', 'such', 'too', 'why', "aren't", 'once', 'we', 'both', 'until', "she'll", 'under', 'could', "what's", 'yours', 'an', 'but', 'after', "wasn't", 'into', "didn't", 'during', 'below', 'yourself', "he's", "you'll", 'our', 'that', 'with', 'from', "there's", 'he', 'through', 'off', 'what', 'its', "weren't", "i'm", 'have', "i've", 'each', "they'll", 'up', 'were', "won't", 'also', 'his', 'more', "who's", "shouldn't", 'of', 'just', 'on', 'those', 'be', "he'd", 'been', 'since', 'down', "she'd", 'having', 'positive' and 'negative'

2.4 Kernel density mapping

We examined the spatial variation of mental health using kernel density estimates (KDE) based on the geocoded point locations of geotweets. A kernel density is a density of features within a given bandwidth based on a kernel function[26]. In this study, we adopted the kernel density function tool in ArcGIS 10.8. A crucial point for KDE is the selection of the bandwidth. We started with the tool's default bandwidth calculated based on the Silverman's Rule of Thumb[31] and this method has the advantage in coping with spatial data outliers (i.e., points that are far away from the rest of the points), and is commonly used in spatial econometrics to identify optimal search radius at different spatial scales. We also tested the robustness of the KDE to bandwidth by adjusting the bandwidth through trial-and-error to identify the most suitable bandwidth for use to produce density estimate of sentiment scores in eight capital cities. Each KDE map was symbolised by a blue-red gradient colour scheme using Jenks natural breaks classification method to enhance the discrepancies between relatively high and low values: blue coloured areas with lower sentiment scores (termed as coldspots) indicating the concentrations of pessimistic mentality, yellow to orange coloured areas indicating neutral mentality, and the red coloured areas with higher sentiment scores (termed as hotspots) indicating the concentrations of optimistic mentality.

2.5 Open-source workflow

We built a sharable workflow embedding all the models we used in this study. Our analytical procedure is reproducible through this workflow assembling three components (VADER model, NRCLex model and WordCloud model) can be run by users with limited programming background via an open-source platform, KNIME (https://www.knime.com/). This workflow can be accessed in 10.6084/m9.figshare.14985153.

3. Results

Table A2. Statistical summary of geotweets across space and time

	Sydney	Melbourne	Brisbane	Perth	Adelaide	Hobart	Darwin	Canberra	All capital cities	% Phase [D]
Phase 1	2,800	2,674	875	633	451	59	51	328	7,871	4.09
Phase 2	23,107	23,928	7,297	5,859	4,312	997	403	2,800	68,703	35.71
Phase 3	26,123	45,013	7,671	7,003	6,044	779	716	3,045	96,394	50.10
Phase 4	5,866	7,540	2,097	2,020	1,066	98	66	671	19,424	10.10
Total geotweets	57,896	79,155	17,940	15,515	11,873	1,933	1,236	6,844	192,392	—
Total population [A]	5,367,206	5,159,211	2,560,720	2,125,114	1,376,601	238,834	147,231	431,380	17,406,297	—
% Geotweets in a city [B]	30.09	41.14	9.32	8.06	6.17	1.00	0.64	3.56	—	—
G/P ratio (per 1000) [C]	10.79	15.34	7.01	7.30	8.62	8.09	8.39	15.87	11.05	—

A. Data source: Australian Bureau of Statistics, 2020 [25]
B. This percentage is calculated as the number of geotweets in a city over the total number of geotweets.
C. This G/P ratio is calculated as the number of geotweets in a city over the total number of population living in that city per 1,000 people.
D. This percentage is calculated as the number of geotweets in a certain phase the total number of geotweets.

Table A3. Sentiment component scores at the national level over four phases

Period	Mean	95% CI	Change over phases (%)*
Full timeline	0.047	(0.042, 0.053)	—
Phase 1	-0.043	(-0.052, -0.034)	—
Phase 2	0.058	(0.055, 0.062)	174.14 (154.84, 194.55)
Phase 3	0.064	(0.061, 0.066)	9.38 (6.06, 9.84)
Phase 4	0.043	(0.037, 0.049)	-48.84 (-64.86, -34.69)

Note: *the change of sentiment scores is calculated as the difference of sentiment score in the previous and later phase over the one in the later phase.

Table A4. Proportions of emotion (%) by type at the national level over four phases

Emotion type	Full timeline		Phase 1		Phase 2		Phase 3		Phase 4	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
Fear	19.485	(19.325, 19.652)	21.520	(20.819, 22.270)	18.578	(18.409, 18.721)	19.218	(19.073, 19.367)	19.843	(19.463, 20.205)
Anger	9.569	(9.452, 9.682)	10.614	(9.969, 11.273)	9.172	(9.038, 9.316)	9.479	(9.377, 9.577)	9.443	(9.264, 9.634)
Sadness	13.806	(13.701, 13.919)	13.894	(13.324, 14.489)	13.560	(13.403, 13.700)	13.902	(13.794, 14.013)	13.664	(13.428, 13.883)
Disgust	7.135	(7.011, 7.256)	9.268	(8.734, 9.855)	6.540	(6.438, 6.642)	6.920	(6.830, 7.002)	6.704	(6.511, 6.889)
Surprise	7.482	(7.392, 7.572)	7.087	(6.654, 7.514)	7.515	(7.409, 7.625)	7.614	(7.506, 7.743)	7.277	(7.135, 7.408)
Anticipation	15.564	(15.430, 15.691)	14.730	(14.034, 15.394)	16.251	(16.110, 16.385)	15.433	(15.311, 15.562)	15.985	(15.695, 16.282)
Trust	17.444	(17.251, 17.609)	15.196	(14.285, 16.097)	18.226	(18.004, 18.470)	17.648	(17.511, 17.793)	17.767	(17.464, 18.097)
Joy	9.516	(9.387, 9.629)	7.691	(7.139, 8.258)	10.157	(10.022, 10.298)	9.787	(9.672, 9.908)	9.316	(9.105, 9.535)

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Table A5. Frequencies of keywords discussed by the public over four phases (to be continued)

Optimistic mentality											
Phase 1			**Phase 2**			**Phase 3**			**Phase 4**		
Keywords	**Count**	**Ratio***	**Keywords**	**Count**	**Ratio***	**Keywords**	**Count**	**Ratio***	**Keywords**	**Count**	**Ratio***
well	145	1.88	lockdown	1534	1.84	lockdown	3573	2.77	vaccine	1023	3.86
great	143	1.86	go	1462	1.76	well	2504	1.94	well	592	2.23
go	137	1.78	time	1461	1.75	go	2281	1.77	lockdown	592	2.23
quarantine	126	1.64	well	1436	1.72	vaccine	1899	1.47	go	494	1.86
good	111	1.44	thank	1341	1.61	thank	1842	1.43	vaccinate	403	1.52
hope	106	1.38	great	1206	1.45	one	1742	1.35	one	384	1.45
know	101	1.31	need	1153	1.38	great	1698	1.32	need	383	1.45
love	99	1.29	work	1120	1.34	need	1670	1.30	good	367	1.38
vaccine	98	1.27	u	1091	1.31	time	1666	1.29	australia	364	1.37
china	97	1.26	good	1059	1.27	hope	1583	1.23	thank	345	1.30
australia	96	1.25	love	1038	1.25	work	1527	1.19	great	333	1.26
need	91	1.18	make	1035	1.24	day	1489	1.16	time	332	1.25
work	91	1.18	one	1028	1.23	say	1457	1.13	day	318	1.20
time	86	1.12	australia	1019	1.22	australia	1456	1.13	vaccine	318	1.20
make	85	1.10	day	976	1.17	make	1436	1.11	make	289	1.09
help	85	1.10	help	931	1.12	good	1420	1.10	see	287	1.08
say	84	1.09	new	922	1.11	think	1404	1.09	work	285	1.08
thank	81	1.05	support	881	1.06	love	1318	1.02	say	285	1.08
day	78	1.01	quarantine	871	1.05	help	1289	1.00	love	276	1.04
think	77	1.00	hope	833	1.00	new	1288	1.00	take	265	1.00

Note: * the ratio is calculated as the count of a given word over the count of the lowest ranked word (the word on the bottom)

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Table A5. Frequencies of keywords discussed by the public over four phases

Pessimistic mentality											
Phase 1			**Phase 2**			**Phase 3**			**Phase 4**		
Keywords	**Count**	**Ratio***	**Keywords**	**Count**	**Ratio***	**Keywords**	**Count**	**Ratio***	**Keywords**	**Count**	**Ratio***
china	226	2.31	go	1331	2.32	lockdown	1946	2.22	vaccine	912	4.24
go	206	2.10	u	1170	2.04	go	1739	1.98	lockdown	410	1.91
australia	158	1.61	lockdown	929	1.62	u	1445	1.65	go	397	1.85
say	146	1.49	say	913	1.59	say	1391	1.59	australia	371	1.73
one	144	1.47	die	908	1.58	vaccine	1342	1.53	one	337	1.57
bad	142	1.45	one	901	1.57	one	1330	1.52	say	323	1.50
need	126	1.29	need	837	1.46	die	1267	1.44	vaccinate	305	1.42
die	124	1.27	death	780	1.36	need	1167	1.33	u	268	1.25
panic	118	1.20	time	776	1.35	bad	1161	1.32	vaccination	261	1.21
death	117	1.19	crisi	770	1.34	australia	1051	1.20	government	252	1.17
spread	116	1.18	australia	769	1.34	know	1038	1.18	need	249	1.16
toilet paper	116	1.18	bad	767	1.34	think	1035	1.18	india	244	1.13
fear	115	1.17	think	733	1.28	make	1010	1.15	death	243	1.13
stop	106	1.08	know	687	1.20	take	940	1.07	risk	241	1.12
quarantine	104	1.06	make	658	1.15	death	939	1.07	die	236	1.10
make	104	1.06	kill	655	1.14	time	927	1.06	country	229	1.07
time	101	1.03	take	615	1.07	trump	915	1.04	bad	227	1.06
infect	100	1.02	trump	601	1.05	victoria	908	1.04	know	225	1.05
case	100	1.02	fuck	581	1.01	many	896	1.02	case	217	1.01
know	98	1.00	china	574	1.00	see	877	1.00	still	215	1.00

Note: * the ratio is calculated as the count of a given word over the count of the lowest ranked word (the word on the bottom)

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Table A6. Sentiment component scores over four phases in eight capital cities

	Sydney		Melbourne		Brisbane		Perth		Adelaide		Darwin		Hobart		Canberra	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
Phase 1	-0.011	(-0.059, 0.049)	-0.078	(-0.126, -0.032)	-0.047	(-0.110, 0.014)	-0.038	(-0.104, 0.030)	-0.109	(-0.193, -0.029)	0.011	(-0.118, 0.142)	0.030	(-0.109, 0.176)	-0.014	(-0.105, 0.085)
Phase 2	0.079	(0.071, 0.086)	0.065	(0.055, 0.077)	0.078	(0.061, 0.093)	0.032	(0.014, 0.048)	0.118	(0.102, 0.135)	0.055	(-0.026, 0.133)	0.046	(0.002, 0.089)	0.057	(0.033, 0.081)
Phase 3	0.068	(0.062, 0.075)	0.074	(0.067, 0.081)	0.071	(0.059, 0.085)	0.047	(0.032, 0.062)	0.067	(0.047, 0.085)	0.026	(-0.022, 0.078)	0.051	(0.007, 0.092)	0.086	(0.064, 0.107)
Phase 4	0.038	(0.021, 0.054)	0.056	(0.040, 0.071)	0.067	(0.042, 0.090)	-0.005	(-0.032, 0.022)	0.063	(0.024, 0.100)	0.021	(-0.102, 0.152)	0.080	(-0.032, 0.193)	0.048	(0.042, 0.054)

Table A7. Changes of sentiment scores (%) over four phases in eight capital cities

Period	Sydney	Melbourne	Brisbane	Perth	Adelaide	Darwin	Hobart	Canberra
Phase 1 to 2	113.9	220.0	160.3	218.8	192.4	80.0	34.8	124.6
Phase 2 to 3	-16.2	12.2	-9.9	31.9	-76.1	-111.5	9.8	33.7
Phase 3 to 4	-78.9	-32.1	-6.0	104.1	-6.3	-23.8	36.3	-79.2

Table A8. Proportions of emotion (%) by type in eight capital cities in Phase 1 (early phase)

Emotion type	Sydney		Melbourne		Brisbane		Perth		Adelaide		Darwin		Hobart		Canberra	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
Fear	20.679	(20.307, 21.402)	21.044	(20.842, 21.309)	20.564	(20.295, 20.845)	21.535	(20.925, 22.591)	19.261	(18.761, 19.725)	21.250	(20.059, 24.138)	21.147	(19.898, 24.157)	21.983	(21.050, 23.203)
Anger	10.052	(9.908, 10.201)	9.579	(9.549, 9.657)	10.090	(10.023, 10.135)	10.041	(9.949, 10.035)	10.617	(10.379, 10.785)	7.500	(6.897, 8.193)	9.677	(8.929, 10.674)	9.020	(8.897, 9.313)
Anticipation	14.574	(14.506, 14.593)	15.261	(15.096, 15.291)	14.237	(14.241, 14.540)	15.188	(15.081, 15.296)	15.107	(14.628, 15.653)	17.500	(15.814, 20.000)	17.204	(16.292, 18.622)	15.173	(14.627, 15.447)
Trust	16.649	(16.498, 16.712)	16.025	(15.961, 16.138)	15.413	(15.316, 15.490)	15.598	(15.297, 15.788)	15.611	(15.465, 16.284)	16.667	(15.172, 16.952)	12.545	(12.245, 12.760)	18.996	(18.626, 19.422)
Surprise	7.635	(7.417, 7.746)	7.498	(7.398, 7.619)	7.375	(7.344, 7.508)	7.168	(7.090, 7.250)	7.595	(7.396, 7.781)	7.083	(6.207, 7.346)	6.810	(6.180, 6.888)	6.631	(6.372, 6.685)
Sadness	13.498	(13.349, 13.694)	13.889	(13.798, 14.006)	13.702	(13.464, 13.733)	13.925	(13.568, 14.190)	13.051	(12.883, 13.187)	13.333	(13.103, 14.119)	15.771	(15.306, 16.292)	14.875	(14.678, 15.359)
Disgust	9.150	(8.754, 9.363)	8.979	(8.644, 9.202)	9.897	(9.617, 10.171)	9.157	(8.710, 9.727)	10.155	(8.945, 11.107)	9.583	(8.276, 10.171)	10.394	(8.989, 10.969)	7.049	(6.372, 7.542)
Joy	7.764	(7.528, 8.022)	7.724	(7.649, 7.841)	8.722	(8.296, 8.982)	7.389	(6.632, 7.871)	8.603	(8.430, 8.689)	7.083	(6.207, 7.346)	6.452	(5.056, 7.143)	6.272	(6.127, 6.278)

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Table A9. Proportions of emotion (%) by type in eight capital cities in Phase 2 (the first wave of the pandemic)

Emotion type	Sydney		Melbourne		Brisbane		Perth		Adelaide		Darwin		Hobart		Canberra	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
Fear	18.496	(18.478, 18.506)	18.478	(18.456, 18.602)	18.260	(18.255, 18.268)	19.650	(19.520, 19.730)	17.952	(17.793, 18.135)	18.920	(18.515, 19.299)	21.883	(21.760, 21.958)	19.613	(19.565, 19.747)
Anger	8.795	(8.752, 8.813)	9.107	(9.043, 9.178)	8.970	(8.889, 9.009)	9.718	(9.660, 9.726)	8.405	(8.323, 8.491)	8.169	(7.863, 8.199)	9.660	(9.313, 10.139)	8.953	(8.927, 9.024)
Anticipation	16.591	(16.561, 16.599)	16.059	(15.962, 16.120)	16.608	(16.555, 16.650)	15.939	(15.934, 15.962)	17.462	(17.287, 17.582)	17.418	(17.323, 17.490)	15.402	(15.190, 15.474)	15.473	(15.414, 15.521)
Trust	18.756	(18.746, 18.830)	18.279	(18.181, 18.350)	18.789	(18.711, 18.867)	17.317	(17.306, 17.371)	18.631	(18.621, 18.679)	20.376	(20.361, 20.548)	16.120	(15.702, 16.632)	19.074	(19.008, 19.104)
Surprise	7.276	(7.229, 7.329)	7.516	(7.482, 7.535)	7.468	(7.439, 7.478)	7.464	(7.453, 7.493)	7.605	(7.556, 7.781)	6.573	(6.551, 6.582)	5.906	(5.805, 5.940)	7.280	(7.159, 7.321)
Sadness	13.151	(13.115, 13.166)	13.681	(13.613, 13.691)	13.261	(13.247, 13.313)	13.784	(13.656, 13.797)	13.457	(13.346, 13.589)	13.005	(13.007, 13.043)	16.140	(16.113, 16.148)	14.261	(14.157, 14.393)
Disgust	6.248	(6.202, 6.292)	6.779	(6.752, 6.788)	6.175	(6.091, 6.182)	7.065	(6.963, 7.246)	5.937	(5.772, 6.127)	5.399	(5.003, 5.851)	6.973	(6.764, 7.271)	6.337	(6.248, 6.450)
Joy	10.687	(10.676, 10.725)	10.101	(10.071, 10.135)	10.469	(10.452, 10.566)	9.062	(9.053, 9.076)	10.552	(10.524, 10.593)	10.141	(10.133, 10.303)	7.916	(7.886, 7.925)	9.059	(8.999, 9.062)

Table A10. Proportions of emotion (%) by type in eight capital cities in Phase 3 (the second wave of the pandemic)

Emotion type	Sydney		Melbourne		Brisbane		Perth		Adelaide		Darwin		Hobart		Canberra	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
Fear	19.204	(19.164, 19.260)	19.268	(19.251, 19.315)	18.852	(18.774, 18.869)	20.291	(20.228, 20.399)	18.709	(18.384, 19.019)	20.644	(20.485, 20.691)	19.148	(18.935, 19.398)	19.439	(19.428, 19.479)
Anger	9.079	(9.055, 9.096)	9.455	(9.439, 9.488)	9.336	(9.286, 9.355)	9.494	(9.317, 9.573)	9.644	(9.430, 9.854)	10.405	(10.202, 10.552)	9.018	(8.783, 9.166)	9.118	(9.086, 9.132)
Anticipation	15.688	(15.608, 15.737)	15.319	(15.284, 15.324)	15.676	(15.667, 15.715)	15.180	(15.109, 15.288)	16.140	(16.124, 16.143)	15.380	(15.063, 15.757)	16.237	(16.092, 16.608)	15.415	(15.265, 15.573)
Trust	17.848	(17.774, 17.862)	17.708	(17.663, 17.711)	17.810	(17.752, 17.882)	17.030	(17.000, 17.061)	16.638	(16.491, 16.803)	18.373	(18.362, 18.498)	17.964	(17.773, 18.195)	17.156	(16.751, 17.600)
Surprise	7.590	(7.539, 7.625)	7.437	(7.425, 7.450)	7.639	(7.577, 7.690)	7.614	(7.579, 7.624)	8.421	(8.358, 8.460)	7.143	(7.128, 7.167)	7.077	(6.785, 7.487)	8.333	(8.027, 8.781)
Sadness	13.822	(13.816, 13.837)	14.012	(13.997, 14.056)	13.891	(13.839, 13.910)	13.909	(13.810, 14.004)	14.000	(13.961, 14.011)	13.439	(13.278, 13.570)	13.680	(13.604, 13.707)	14.494	(14.220, 14.698)
Disgust	6.595	(6.565, 6.620)	7.139	(7.108, 7.184)	6.656	(6.603, 6.678)	6.955	(6.924, 6.987)	6.860	(6.524, 7.287)	5.636	(5.459, 5.767)	6.840	(6.594, 6.968)	6.669	(6.526, 6.734)
Joy	10.174	(10.146, 10.196)	9.661	(9.647, 9.748)	10.141	(10.109, 10.203)	9.526	(9.459, 9.640)	9.588	(9.490, 9.660)	8.980	(8.987, 9.005)	10.036	(9.931, 10.975)	9.377	(9.257, 9.444)

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Table A11. Proportions of emotion (%) by type in eight capital cities in Phase 4 (later phase)

Emotion type	Sydney		Melbourne		Brisbane		Perth		Adelaide		Darwin		Hobart		Canberra	
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
Fear	19.866	(19.846, 19.927)	19.431	(19.111, 19.921)	18.472	(18.013, 18.793)	20.582	(20.378, 20.861)	19.959	(19.723, 20.422)	21.260	(20.736, 21.542)	19.091	18.292, 20.845	19.123	19.098, 19.144
Anger	9.268	(9.203, 9.323)	9.418	(9.313, 9.455)	8.893	(8.734, 8.993)	9.635	(9.420, 9.830)	9.783	(9.655, 9.830)	8.661	(7.700, 9.109)	9.773	9.761, 9.915	9.318	9.305, 9.328
Anticipation	15.785	(15.761, 15.839)	16.325	(15.746, 16.711)	16.499	(16.459, 16.678)	16.105	(16.008, 16.228)	16.561	(16.522, 16.631)	15.486	(15.310, 15.765)	14.318	13.680, 14.460	15.756	15.741, 15.767
Trust	18.219	(18.120, 18.250)	17.570	(17.506, 17.751)	18.483	(18.340, 18.758)	17.581	(17.394, 17.828)	16.580	(16.565, 16.699)	18.635	(18.023, 20.379)	18.864	18.565, 19.147	17.827	17.812, 17.842
Surprise	7.201	(7.188, 7.264)	7.230	(7.137, 7.323)	7.359	(7.104, 7.589)	7.264	(7.049, 7.475)	7.468	(7.411, 7.478)	6.824	(6.162, 7.171)	7.045	6.188, 7.351	7.530	7.519, 7.541
Sadness	13.812	(13.752, 13.844)	13.703	(13.350, 14.101)	13.710	(13.496, 13.868)	13.084	(13.073, 13.125)	13.219	(12.919, 13.318)	11.286	(10.382, 11.822)	16.591	15.894, 17.596	13.762	13.752, 13.772
Disgust	6.431	(6.297, 6.524)	6.940	(6.798, 7.067)	6.275	(6.235, 6.280)	6.654	(6.612, 6.721)	7.132	(6.866, 7.352)	6.037	(5.768, 6.202)	4.773	3.908, 5.471	6.904	6.804, 6.907
Joy	9.419	(9.410, 9.452)	9.382	(9.090, 9.619)	10.309	(9.989, 10.670)	9.096	(8.697, 9.412)	9.298	(9.132, 9.507)	11.811	(11.628, 12.304)	9.545	9.445, 9.569	9.780	9.602, 9.864

Table A12. Changes of emotion (%) by type in eight capital cities over four phases

	Fear	Anger	Sadness	Disgust	Joy	Anticipation	Trust	Surprise
Phase 1 to 2								
Sydney	-2.142	-1.209	-0.272	-2.882	2.912	1.907	2.100	-0.413
Melbourne	-2.564	-0.472	-0.209	-2.199	2.376	0.796	2.254	0.018
Brisbane	-2.304	-1.120	-0.442	-3.723	1.747	2.372	3.377	0.093
Perth	-1.887	-0.323	-0.140	-2.092	1.674	0.752	1.719	0.296
Adelaide	-1.309	-2.212	0.407	-4.218	1.950	2.356	3.016	0.010
Hobart	0.736	-0.018	0.370	-3.421	1.465	-1.802	3.575	-0.904
Darwin	-2.330	0.669	-0.329	-4.184	3.058	-0.082	3.709	-0.511
Canberra	-2.370	-0.118	-0.613	-0.712	2.786	0.300	0.078	0.649
Phase 2 to 3								
Sydney	0.785	0.280	0.663	0.323	-0.566	-0.886	-0.872	0.274
Melbourne	0.787	0.348	0.332	0.360	-0.439	-0.738	-0.571	-0.079
Brisbane	0.592	0.367	0.630	0.481	-0.328	-0.933	-0.979	0.171
Perth	0.647	-0.223	0.127	-0.110	0.462	-0.763	-0.288	0.148
Adelaide	0.756	1.238	0.543	0.923	-0.965	-1.323	-1.989	0.816
Hobart	-2.735	-0.642	-2.460	-0.133	2.119	0.835	1.845	1.170
Darwin	1.724	2.236	0.435	0.237	-1.161	-2.038	-2.002	0.570
Canberra	-0.174	0.215	0.233	0.332	0.319	-0.059	-1.919	1.053
Phase 3 to 4								
Sydney	0.648	0.196	0.029	-0.132	-0.765	0.042	0.306	-0.324
Melbourne	0.164	-0.037	-0.309	-0.199	-0.279	1.006	-0.138	-0.207
Brisbane	-0.379	-0.444	-0.182	-0.380	0.168	0.823	0.673	-0.280
Perth	0.288	0.140	-0.828	-0.302	-0.429	0.929	0.551	-0.348
Adelaide	1.250	0.140	-0.782	0.272	-0.290	0.421	-0.058	-0.953
Hobart	-0.057	0.755	2.910	-2.068	-0.490	-1.919	0.899	-0.031
Darwin	0.616	-1.743	-2.153	0.401	2.831	0.106	0.262	-0.319
Canberra	1.176	0.113	-2.340	0.131	0.130	-0.676	2.137	-0.671

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