Chi Squared Distribution
Upper percentage points
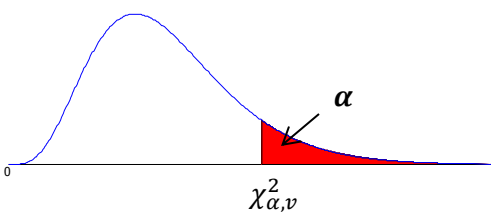
α **Probability of a greater value**

v	0.995	0.99	0.975	0.95	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.05	0.025	0.01	0.005
1	0.00	0.00	0.00	0.00	0.02	0.06	0.15	0.27	0.45	0.71	1.07	1.64	2.71	3.84	5.02	6.63	7.88
2	0.01	0.02	0.05	0.10	0.21	0.45	0.71	1.02	1.39	1.83	2.41	3.22	4.61	5.99	7.38	9.21	10.60
3	0.07	0.11	0.22	0.35	0.58	1.01	1.42	1.87	2.37	2.95	3.66	4.64	6.25	7.81	9.35	11.34	12.84
4	0.21	0.30	0.48	0.71	1.06	1.65	2.19	2.75	3.36	4.04	4.88	5.99	7.78	9.49	11.14	13.28	14.86
5	0.41	0.55	0.83	1.15	1.61	2.34	3.00	3.66	4.35	5.13	6.06	7.29	9.24	11.07	12.83	15.09	16.75
6	0.68	0.87	1.24	1.64	2.20	3.07	3.83	4.57	5.35	6.21	7.23	8.56	10.64	12.59	14.45	16.81	18.55
7	0.99	1.24	1.69	2.17	2.83	3.82	4.67	5.49	6.35	7.28	8.38	9.80	12.02	14.07	16.01	18.48	20.28
8	1.34	1.65	2.18	2.73	3.49	4.59	5.53	6.42	7.34	8.35	9.52	11.03	13.36	15.51	17.53	20.09	21.95
9	1.73	2.09	2.70	3.33	4.17	5.38	6.39	7.36	8.34	9.41	10.66	12.24	14.68	16.92	19.02	21.67	23.59
10	2.16	2.56	3.25	3.94	4.87	6.18	7.27	8.30	9.34	10.47	11.78	13.44	15.99	18.31	20.48	23.21	25.19
11	2.60	3.05	3.82	4.57	5.58	6.99	8.15	9.24	10.34	11.53	12.90	14.63	17.28	19.68	21.92	24.72	26.76
12	3.07	3.57	4.40	5.23	6.30	7.81	9.03	10.18	11.34	12.58	14.01	15.81	18.55	21.03	23.34	26.22	28.30
13	3.57	4.11	5.01	5.89	7.04	8.63	9.93	11.13	12.34	13.64	15.12	16.98	19.81	22.36	24.74	27.69	29.82
14	4.07	4.66	5.63	6.57	7.79	9.47	10.82	12.08	13.34	14.69	16.22	18.15	21.06	23.68	26.12	29.14	31.32
15	4.60	5.23	6.26	7.26	8.55	10.31	11.72	13.03	14.34	15.73	17.32	19.31	22.31	25.00	27.49	30.58	32.80
16	5.14	5.81	6.91	7.96	9.31	11.15	12.62	13.98	15.34	16.78	18.42	20.47	23.54	26.30	28.85	32.00	34.27
17	5.70	6.41	7.56	8.67	10.09	12.00	13.53	14.94	16.34	17.82	19.51	21.61	24.77	27.59	30.19	33.41	35.72
18	6.26	7.01	8.23	9.39	10.86	12.86	14.44	15.89	17.34	18.87	20.60	22.76	25.99	28.87	31.53	34.81	37.16
19	6.84	7.63	8.91	10.12	11.65	13.72	15.35	16.85	18.34	19.91	21.69	23.90	27.20	30.14	32.85	36.19	38.58
20	7.43	8.26	9.59	10.85	12.44	14.58	16.27	17.81	19.34	20.95	22.77	25.04	28.41	31.41	34.17	37.57	40.00
21	8.03	8.90	10.28	11.59	13.24	15.44	17.18	18.77	20.34	21.99	23.86	26.17	29.62	32.67	35.48	38.93	41.40
22	8.64	9.54	10.98	12.34	14.04	16.31	18.10	19.73	21.34	23.03	24.94	27.30	30.81	33.92	36.78	40.29	42.80
23	9.26	10.20	11.69	13.09	14.85	17.19	19.02	20.69	22.34	24.07	26.02	28.43	32.01	35.17	38.08	41.64	44.18
24	9.89	10.86	12.40	13.85	15.66	18.06	19.94	21.65	23.34	25.11	27.10	29.55	33.20	36.42	39.36	42.98	45.56
25	10.52	11.52	13.12	14.61	16.47	18.94	20.87	22.62	24.34	26.14	28.17	30.68	34.38	37.65	40.65	44.31	46.93

Chi Square Distribution – continued.

v	0.995	0.99	0.975	0.95	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.05	0.025	0.01	0.005
26	11.16	12.20	13.84	15.38	17.29	19.82	21.79	23.58	25.34	27.18	29.25	31.79	35.56	38.89	41.92	45.64	48.29
27	11.81	12.88	14.57	16.15	18.11	20.70	22.72	24.54	26.34	28.21	30.32	32.91	36.74	40.11	43.19	46.96	49.64
28	12.46	13.56	15.31	16.93	18.94	21.59	23.65	25.51	27.34	29.25	31.39	34.03	37.92	41.34	44.46	48.28	50.99
29	13.12	14.26	16.05	17.71	19.77	22.48	24.58	26.48	28.34	30.28	32.46	35.14	39.09	42.56	45.72	49.59	52.34
30	13.79	14.95	16.79	18.49	20.60	23.36	25.51	27.44	29.34	31.32	33.53	36.25	40.26	43.77	46.98	50.89	53.67
31	14.46	15.66	17.54	19.28	21.43	24.26	26.44	28.41	30.34	32.35	34.60	37.36	41.42	44.99	48.23	52.19	55.00
32	15.13	16.36	18.29	20.07	22.27	25.15	27.37	29.38	31.34	33.38	35.66	38.47	42.58	46.19	49.48	53.49	56.33
33	15.82	17.07	19.05	20.87	23.11	26.04	28.31	30.34	32.34	34.41	36.73	39.57	43.75	47.40	50.73	54.78	57.65
34	16.50	17.79	19.81	21.66	23.95	26.94	29.24	31.31	33.34	35.44	37.80	40.68	44.90	48.60	51.97	56.06	58.96
35	17.19	18.51	20.57	22.47	24.80	27.84	30.18	32.28	34.34	36.47	38.86	41.78	46.06	49.80	53.20	57.34	60.27
36	17.89	19.23	21.34	23.27	25.64	28.73	31.12	33.25	35.34	37.50	39.92	42.88	47.21	51.00	54.44	58.62	61.58
37	18.59	19.96	22.11	24.07	26.49	29.64	32.05	34.22	36.34	38.53	40.98	43.98	48.36	52.19	55.67	59.89	62.88
38	19.29	20.69	22.88	24.88	27.34	30.54	32.99	35.19	37.34	39.56	42.05	45.08	49.51	53.38	56.90	61.16	64.18
39	20.00	21.43	23.65	25.70	28.20	31.44	33.93	36.16	38.34	40.59	43.11	46.17	50.66	54.57	58.12	62.43	65.48
40	20.71	22.16	24.43	26.51	29.05	32.34	34.87	37.13	39.34	41.62	44.16	47.27	51.81	55.76	59.34	63.69	66.77
41	21.42	22.91	25.21	27.33	29.91	33.25	35.81	38.11	40.34	42.65	45.22	48.36	52.95	56.94	60.56	64.95	68.05
42	22.14	23.65	26.00	28.14	30.77	34.16	36.75	39.08	41.34	43.68	46.28	49.46	54.09	58.12	61.78	66.21	69.34
43	22.86	24.40	26.79	28.96	31.63	35.07	37.70	40.05	42.34	44.71	47.34	50.55	55.23	59.30	62.99	67.46	70.62
44	23.58	25.15	27.57	29.79	32.49	35.97	38.64	41.02	43.34	45.73	48.40	51.64	56.37	60.48	64.20	68.71	71.89
45	24.31	25.90	28.37	30.61	33.35	36.88	39.58	42.00	44.34	46.76	49.45	52.73	57.51	61.66	65.41	69.96	73.17
46	25.04	26.66	29.16	31.44	34.22	37.80	40.53	42.97	45.34	47.79	50.51	53.82	58.64	62.83	66.62	71.20	74.44
47	25.77	27.42	29.96	32.27	35.08	38.71	41.47	43.94	46.34	48.81	51.56	54.91	59.77	64.00	67.82	72.44	75.70
48	26.51	28.18	30.75	33.10	35.95	39.62	42.42	44.92	47.34	49.84	52.62	55.99	60.91	65.17	69.02	73.68	76.97
49	27.25	28.94	31.55	33.93	36.82	40.53	43.37	45.89	48.33	50.87	53.67	57.08	62.04	66.34	70.22	74.92	78.23
50	27.99	29.71	32.36	34.76	37.69	41.45	44.31	46.86	49.33	51.89	54.72	58.16	63.17	67.50	71.42	76.15	79.49
60	35.53	37.48	40.48	43.19	46.46	50.64	53.81	56.62	59.33	62.13	65.23	68.97	74.40	79.08	83.30	88.38	91.95
70	43.28	45.44	48.76	51.74	55.33	59.90	63.35	66.40	69.33	72.36	75.69	79.71	85.53	90.53	95.02	100.43	104.21
80	51.17	53.54	57.15	60.39	64.28	69.21	72.92	76.19	79.33	82.57	86.12	90.41	96.58	101.88	106.63	112.33	116.32
90	59.20	61.75	65.65	69.13	73.29	78.56	82.51	85.99	89.33	92.76	96.52	101.05	107.57	113.15	118.14	124.12	128.30
100	67.33	70.06	74.22	77.93	82.36	87.95	92.13	95.81	99.33	102.95	106.91	111.67	118.50	124.34	129.56	135.81	140.17