

Supporting Information for

ANALYZING THE EFFECTS OF DROUGHT AT DIFFERENT TIME SCALES ON CAUSE-SPECIFIC MORTALITY IN SOUTH AFRICA

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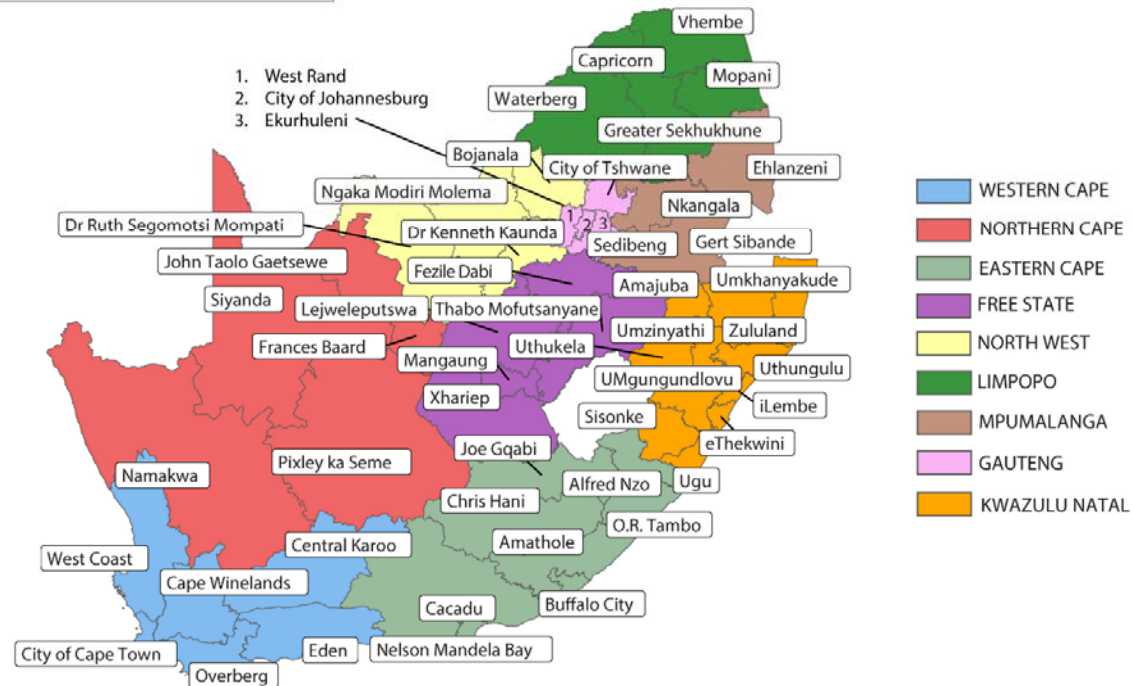


Figure S1. Study region showing the 52 district municipalities of South Africa, grouped into 9 provinces (colours) within the broader Southern African region. South Africa is a country located at the southern tip of Africa. It has a population of 60.14 million people and covers a geographical extent of 1219602 km² [1,2]. South Africa is known for its cultural and linguistic diversity [2], but also its heterogeneous climate due to the

irregular topography and its contrasting oceanic conditions of the warm Agulhas Current on the east coast and the upwelling cold Benguela Current on the west coast. Associated with these oceanic conditions and the mean positions of the subtropical anticyclones, there is a strong east-to-west decreasing gradient in precipitation and increasing aridity [3]. The region is often influenced by high-pressure systems, which result in sinking air and inhibit cloud formation and rainfall [4], leading to an average annual rainfall of 464 mm, which is substantially below the global average [1]. Additionally, the semi-arid climate of South Africa leads to high evaporation rates, resulting in water loss and increasing vulnerability to drought and water scarcity conditions [5].

[1] South African Government, 2023a. Geography and Climate. <https://www.gov.za/about-sa/geography-and-climate> (accessed: 9.8.23).

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[3] Reason CJC. 2017: The Climate of Southern Africa, In Oxford Encyclopedia of Climate Science. Oxford University Press. <https://doi.org/10.1093/acrefore/9780190228620.013.513>

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[5] Orimoloye IR, Belle JA, Orimoloye YM, Olusola AO, Ololade OO. 2022. Drought: A Common Environmental Disaster. Atmosphere 13, 111. <https://doi.org/10.3390/atmos13010111>

Method S1. Quasi-Poisson regression model to estimate the effects of drought on weekly mortality in each district municipality of South Africa between 2009 and 2016.

$$Y_{ti} \sim \text{quasi-Poisson}(\mu_{it})$$
$$\text{Log}(\mu_{it}) = \alpha + \beta_1 \text{SPEIn}_{it} + \text{cb}(\text{Tmean}_{it}, \text{lag} = 3) + M_t + S_t$$

Y_{ti} corresponds to the number of mortality outcomes (independently for each cause of death and population group) on week t in location i in South Africa; α is the intercept; SPEIn_{it} refers to the drought term (we used the continuous series of the drought index obtained at a specific accumulation period, and applied a threshold parametrization (threshold=-0.84) to model the exposure-response association during the same week of exposure, assuming a linear association for values below that threshold); cb is the crossbasis function of mean temperature (Tmean) during 0-3 lag weeks, including three internal knots at the 10th, 75th, 90th percentiles of each mean temperature series. M_t and S_t represent the adjustment of the seasonal and long-trends applying spline functions for time variables.

Table S1. Quasi-Akaike information of models with different specifications to control the seasonality and long-term trend. ns= natural spline function; df= degrees of freedom; date: date in the time series; week: indicator of the week within the year.

Drought Indicator	Population	ns(data\$date, df=2*8)+ns(data\$a\$week, df=2)	ns(data\$date, df=3*8)+ns(data\$a\$week, df=2)	ns(data\$date, df=4*8)+ns(data\$a\$week, df=2)	ns(data\$date, df=2*8)+ns(data\$a\$week, df=3)	ns(data\$date, df=3*8)+ns(data\$a\$week, df=3)	ns(data\$date, df=4*8)+ns(data\$a\$week, df=3)	ns(data\$date, df=2*8)+ns(data\$a\$week, df=4)	ns(data\$date, df=3*8)+ns(data\$a\$week, df=4)	ns(data\$date, df=4*8)+ns(data\$a\$week, df=4)	ns(data\$date, df=5*8)+ns(data\$a\$week, df=4)
SPEI1	Total	213236.3	213882.3	215109.3	213412.2	214041.4	215247	213451.9	214320	215662.5	216937.3
	Children	110834.5	110679.1	110819.2	110609.2	110692.7	110818.5	110647.5	110687.1	110900.4	111088.5
	Pre-adults	107389.6	107711.9	108111.8	107439.7	107762.7	108205.9	107504.5	107871	108258.9	108803.3
	Y-adults	147987.3	148176.2	148839.7	148002.3	148262.6	148968.4	148077.6	148420.7	149080.8	149871.2
	O-adults	146624.7	146893.9	147532.4	146697.4	146989.4	147600.7	146750.7	147088.6	147759.7	148448.3
	Elderly	149688.1	150266.6	150807	149764.7	150380.4	150872.1	149799.9	150404.9	151037.2	151586
	Males	175836.3	176332	177208.9	175951.9	176429.5	177293.8	176021	176640.9	177582.7	178569.2
	Females	167198.6	167692.6	168463	167292.4	167806.3	168574.6	167337.2	167927.2	168742.1	169544.9
	A00-B99	131260.4	131689.6	132171.6	131285.8	131729.7	132234.4	131342.2	131830.3	132304.6	132754.4
	E00-E90	101617.7	102055.9	102497.6	101665.3	102076.4	102533.1	101713.9	102172.5	102611.1	103035.6
	I00-I99	136962.7	137173.2	137637.1	137012.5	137259	137709.8	137042.9	137307.5	137803.4	138319.6
J00-J99	130858.5	130801.2	131073.2	130807.9	130831	131141.2	130795.7	130915	131248.1	131620.7	
SPEI6	Total	213334.8	214066.8	215267.2	213480.2	214197.8	215449.8	213473.8	214470.2	215828.9	217103.6
	Children	110868.5	110722.2	110832.8	110641.4	110727.7	110842.5	110678.5	110717.7	110906.5	110906.5
	Pre-adults	107397.7	107730.4	108145.6	107450.8	107783.8	108237	107515.1	107886.6	108294.6	108814.5
	Y-adults	148096.7	148268.7	148941.6	148072.6	148348.9	149077	148122.8	148504.3	149195.9	149986.4
	O-adults	146718.3	147027.6	147635.7	146769.3	147112.1	147715.3	146802.2	147202.8	147863.5	148556.7
	Elderly	149746.2	150346.3	150878.1	149817.3	150455.4	150944.2	149842.3	150483.6	151107.7	151643.4
	Males	175960.5	176507.9	177350.9	176057	176585.3	177459.4	176096.2	176796.3	177726.4	178707.4
	Females	167189.5	167717.4	168491.3	167264.5	167818.6	168626.8	167294.4	167937.8	168776.7	169569.8
	A00-B99	131298.7	131724.8	132207.3	131323.8	131760	132272.2	131374.4	131869.9	132343.4	132797.5
	E00-E90	101618.7	102079.2	102507.9	101672.5	102095.8	102551.5	101724	102204.2	102623.2	103046.9
	I00-I99	137003.6	137204.3	137662	137046.7	137292.4	137744.8	137051.2	137346.2	137832.4	138355.8
J00-J99	130937.4	130890.7	131130.9	130839.9	130912.9	131209.9	130803.8	130963.2	131310.9	131657.4	

SPEI12	Total	213277.2	213982.5	215233.9	213414.2	214133.8	215396.5	213399.4	214371.5	215792.1	217079.6
	Children	110877.2	110691.3	110808.3	110640.5	110694.6	110811.7	110670.1	110682.9	110874.5	111097.4
	Pre-adults	107394.8	107711.8	108146.8	107440.8	107761.6	108239.5	107503.1	107869	108288.6	108852.1
	Y-adults	148083.7	148243.1	148923.8	148056.2	148326.5	149054.8	148108.7	148476.4	149173.6	149956.6
	O-adults	146721	147012.7	147640.6	146769.7	147098.9	147719.1	146797	147178.7	147866.5	148584.4
	Elderly	149740.3	150337.2	150890	149806.5	150452.5	150949.9	149836.8	150478.2	151128.8	151635
	Males	175908.4	176419.6	177304.3	175993.7	176502.2	177398.5	176017.5	176692.9	177682.4	178679.4
	Females	167205.6	167721	168494.4	167282.1	167837.9	168624.2	167315.8	167939.6	168781	169576.9
	A00-B99	131278.9	131732.6	132223.7	131313.8	131777.8	132289.3	131368.7	131870.3	132355.8	132814.2
	E00-E90	101621	102082	102511.6	101672.3	102098.3	102550.5	101718.2	102201.7	102623.7	103053.2
	I00-I99	136985.9	137204.9	137690	137020	137287.3	137766.3	137033.1	137336.3	137852.2	138367.8
	J00-J99	130936.8	130849.2	131109.2	130831	130878	131190.8	130784.7	130914.3	131289.7	131690.3
SPEI15	Total	213176.9	213949.2	215136	213320.3	214111.1	215332.5	213346.2	214355.1	215717.1	217022.7
	Children	110913.5	110714	110822.5	110686.6	110724.9	110822	110732.4	110713.4	110900.8	111102.8
	Pre-adults	107353.1	107698.5	108109.4	107404.5	107757.1	108203.2	107470.7	107854.6	108259.2	108805.7
	Y-adults	148050.2	148237.5	148910.3	148029.8	148330.1	149053	148083.8	148477.1	149168.7	149950.7
	O-adults	146703.9	146995.6	147608.4	146750.3	147090	147698.5	146783.6	147167.3	147846.6	148562.4
	Elderly	149696.6	150302.9	150830.3	149762.4	150416.7	150902.8	149809.4	150438.9	151061.6	151612.1
	Males	175870.3	176438.8	177258	175962	176532.6	177380.3	176016.4	176729.5	177652.3	178661.6
	Females	167128.5	167663.9	168434.1	167202.8	167780.3	168573.4	167250	167887	168720.7	169538.3
	A00-B99	131338.8	131754.7	132225	131368.5	131793.1	132299.1	131428.9	131903.6	132369.8	132838.3
	E00-E90	101628	102078.7	102508.7	101681	102093.1	102548.1	101731.2	102198.6	102619	103060.4
	I00-I99	136956.7	137168.4	137645.1	136993.8	137265.1	137732.3	137011.8	137304.9	137809.5	138356
	J00-J99	130878.6	130840.8	131117.1	130768.7	130870.9	131191.2	130733.2	130916.6	131297.7	131683.8

Drought Indicator	Population	ns(data\$date, df=3*8)	ns(data\$date, df=4*8)	ns(data\$date, df=5*8)	ns(data\$date, df=3*8)+Seas	ns(data\$date, df=4*8)+Seas	ns(data\$date, df=5*8)+Seas
SPEI1	Total	215620.2	216343.5	217558.4	214968.6	215050.9	216318.8
	Children	110576.4	110708.6	110887.6	110605.4	110694.1	110916.4
	Pre-adults	108301.2	108655.7	109151.3	108253.6	108553.7	109075.6
	Y-adults	149031.5	149637.3	150357.4	148834.8	149259.5	150020.8
	O-adults	147327.4	147821.9	148493.2	147254.8	147545.6	148269.5
	Elderly	150450.1	150881.6	151391.7	150488.2	150745.6	151234.3
	Males	177849.6	178337.4	179276	177500.3	177639.6	178625.5
	Females	168024.9	168668.2	169453.9	167875.6	168242.7	169031.8
	A00-B99	131664.3	132097.1	132569.5	131610.8	131907.4	132380.4
	E00-E90	102042.7	102431.9	102856.2	102130.1	102503.2	102915.7
	I00-I99	137367.7	137742.6	138215.6	137436.1	137659.2	138122.1
J00-J99	131078.6	131252.1	131593.3	131202.1	131322	131669.8	
SPEI6	Total	215998.5	216516.7	217710	215272.4	215183.8	216435.3
	Children	110629.4	110730.2	110932.8	110668.3	110724.7	110962.7
	Pre-adults	108348.2	108680.6	109158.7	108286	108569.9	109081.6
	Y-adults	149189.7	149714	150432.9	148973.6	149319.3	150081.1
	O-adults	147527.8	147931	148602.7	147435	147645.9	148360.7
	Elderly	150503.1	150899.3	151395	150518.6	150764.8	151247.7
	Males	178175.7	178476.4	179401.9	177776.6	177752.3	178731.1
	Females	168108.4	168716.7	169481	167932.3	168273.7	169040.9
	A00-B99	131712.6	132144.2	132619.3	131658.4	131954.6	132427
	E00-E90	102071.2	102453.4	102876.5	102155.8	102526.9	102942.1
	I00-I99	137446.8	137787.8	138259	137495.6	137686.8	138157.8
J00-J99	131216.2	131319	131646.6	131320.6	131379.7	131721.3	
SPEI12	Total	215877.1	216484.2	217689.4	215164.8	215088.1	216356.2
	Children	110592.1	110694.1	110900.5	110623.3	110682	110925.2
	Pre-adults	108351.4	108708.3	109207.8	108290.6	108605	109132.4
	Y-adults	149171.9	149723.6	150423.1	148957.3		150054.4

	O-adults	147503.9	147937	148616.4	147408	149299	148375.2
	Elderly	150464.3	150889.7	151368.5	150418.1	147642.3	151198.7
	Males	178085.8	178456	179386.1	177699.2	150734.2	178703.7
	Females	168075.3	168696.9	169474.9	167897.2	177699.3	168982.6
	A00-B99	131721.7	132156	132624.9	131667.6	131968.3	132436.9
	E00-E90	102065	102447.3	102878.6	102147.3	102501.2	102920
	I00-I99	137439.3	137797.8	138253.6	137495.8	137688.5	138138.1
	J00-J99	131149.6	131276.9	131647.5	131246.5	131318.4	131696.6
SPEI15	Total	215930.7	216429.2	217633.4	215211.5	215115.2	216403.7
	Children	110616.3	110711.9	110909.8	110652	110705.1	110948.4
	Pre-adults	108346	108674.3	109173.2	108277.5	108557.4	109096.6
	Y-adults	149183.3	149716.6	150414.8	148961.8	149327.5	150076.4
	O-adults	147503.7	147922	148600.1	147408	147642.3	148375.2
	Elderly	150461.1	150845.5	151366.9	150478.7	150708.9	151223.2
	Males	178157	178442.3	179364.7	177749.9	177717.4	178711.6
	Females	168050.9	168643.3	169430.6	167888	168220.3	169016.7
	A00-B99	131746.3	132158.6	132643.1	131688.1	131973.2	132462.5
	E00-E90	102062.1	102446.8	102884.1	102141	102509.5	102946.2
	I00-I99	137420.1	137761.6	138247	137471.9	137668.5	138157.3
	J00-J99	131163.8	131297.7	131655.4	131262.4	131360.7	131726.5

Table S2. Classification of the 52 district municipalities of South Africa according to the district-level urbanicity and socioeconomic deprivation. The district municipalities classified as “Urban” correspond to the eight metropolitan municipalities in the country (<https://www.gov.za/about-government/government-system/local-government>), while the those classified as “Rural” corresponded to the rural nodes indicated in the 2011 Census (<http://www.statssa.gov.za/publications/Report-03-10-09/Report-03-10-092011.pdf>). The rest of district municipalities were classified as “Other”. A district-level multidimensional poverty index (MPI) in South Africa was used as a continuous variable using information in 2011 Census. That index accounts for twelve indicators capturing deprivation for four dimensions [1].

District municipalities	Urbanicity level	Multidimensional poverty Index (MPDI)	District municipalities	Urbanicity level	Multidimensional poverty Index (MPDI)	District municipalities	Urbanicity level	Multidimensional poverty Index (MPDI)
Alfred Nzo	No-Urban	0.0913	eThekwini	Urban	0.0171	Sedibeng	Other	0.0136
Amajuba	Other	0.0264	Fezile Dabi	Other	0.0190	Sisonke	No-Urban	0.0668
Amathole	No-Urban	0.0534	Frances Baard	Other	0.0264	Siyanda	Other	0.0201
Bojanala	Other	0.0277	Gert Sibande	Other	0.0283	Thabo Mofutsanyane	No-Urban	0.0268
Buffalo City	Urban	0.0534	Greater Sekhukhune	No-Urban	0.0447	Ugu	No-Urban	0.0570
Cacadu	Other	0.0160	iLembe	Other	0.0459	UMgungundlovu	No-Urban	0.0294
Cape Winelands	Other	0.0064	Joe Gqabi	No-Urban	0.0626	Umkhanyakude	No-Urban	0.0579
Capricorn	Other	0.292	John Taolo Gaetsewe	No-Urban	0.0483	Umzinyathi	No-Urban	0.0726
Central Karoo	No-Urban	0.0122	Lejweleputswa	Other	0.0215	Uthukela	No-Urban	0.0472
Chris Hani	No-Urban	0.0627	Mangaung	Urban	0.0173	Uthungulu	Other	0.0471

City of Cape Town	Urban	0.0096	Mopani	No-Urban	0.0390	Vhembe	Other	0.0384
City of Johannesburg	Urban	0.0096	Namakwa	Other	0.0113	Waterberg	Other	0.0271
City of Tshwane	Urban	0.0133	Nelson Mandela Bay	Urban	0.0153	West Coast	Other	0.0057
Dr Kenneth Kaunda	Other	0.0193	Ngaka Modiri Molema	Other	0.0529	West Rand	Other	0.0235
Dr Ruth Segomotsi Mompati	Other	0.0495	Nkangala	Other	0.0197	Xhariep	Other	0.0233
Eden	Other	0.0135	O.R.Tambo	No-Urban	0.0857	Zululand	No-Urban	0.0451
Ehlanzeni	No-Urban	0.0290	Overberg	Other	0.0090			
Ekurhuleni	Urban	0.0169	Pixley ka Seme	Other	0.0247			

[1] Fransman, T., Yu, D. 2018. Multidimensional poverty in South Africa in 2001-2016. Stellenbosch Economic Working Papers: WP07/2018. www.ekon.sun.ac.za/wpapers/2018/wp072018. Access: 11.03.2024 on 10 September

Table S3. Descriptive statistics corresponding to weekly counts of all-cause mortality and specific causes of the total population (A00-B99= certain parasitic and infectious diseases; E00-E90= nutritional, endocrine and metabolic diseases; I00-I99= circulatory diseases; J00-J99= respiratory diseases) for each district municipality of South Africa and overall, between 2009 and 2016. Total number of all-cause deaths separated by sex (males, females) and age (<5, 5-24, 25-44, 45-64, ≥65 years) groups were also reported. During the study period, a total of 3,757,736 deaths were assessed across all district municipalities of South Africa, with 52% males and 47.7% females. According to age groups, the lowest percentage of deaths was observed in pre-adults (5-24 years), constituting 6.4% of the total deaths in South Africa, in contrast to the oldest population (65 years and above), accounting for 31%. Furthermore, 17.5% of all analyzed deaths were due to certain parasitic and infectious diseases; 5.5% to endocrine, nutritional, and metabolic causes; 20.9% to circulatory conditions, and 16.1% to respiratory diseases. The highest values of deaths were recorded in the City of Johannesburg (n=231888 deaths), eThekweni (n=208860) and the city of Cape Town (n=206999), while the lowest number of deaths were observed in Overberg (n=18059), Namakwa (n=9355), and Central Karoo (n=6271).

District municipalities	all	0-4 years	5-24 years	25-44 years	45-64 years	>= 65 years	males	females	A00B99	E00E90	I00I99	J00J99
Alfred Nzo	47818	3166	4024	14113	11607	14828	23771	23922	6318	1392	3817	4950
Amajuba	40167	3072	2829	12688	11124	10350	20238	19831	7608	2958	9325	8515
Amathole	113409	4654	8369	27713	29509	42988	58262	54905	20748	5506	21179	19790
Bojanala	99790	8871	5406	26956	28021	30310	53305	46131	16057	6551	21029	16886
Buffalo City	68130	2915	4243	17515	19992	23384	34927	33059	13004	3094	16206	11099
Cacadu	42852	2378	2132	9936	13657	14677	22354	20392	7459	1803	10988	6071
Cape Winelands	50250	2621	2347	9757	16546	18890	27460	22675	7048	1631	13164	7326
Capricorn	98802	8741	5432	24559	24900	35111	49117	49527	16949	7671	17436	19571
Central Karoo	6271	358	270	1225	2147	2265	3262	3000	896	177	1847	1022
Chris Hani	73819	3828	5037	18761	20091	26016	38127	35559	12788	3836	15115	13067
City of Cape Town	206999	10972	12521	42782	59388	80851	113329	93048	26854	7065	55247	26714
City of Johannesburg	231888	19196	12189	66099	63908	69589	122750	107598	33397	8514	43759	32018
City of Tshwane	156086	11107	7499	38018	44034	55237	81572	74025	22433	10571	43583	26547

Dr Kenneth Kaunda	58191	5313	3080	15541	17864	16318	31481	26553	12307	3012	11162	9505
Dr Ruth Segomotsi Mompati	47585	5935	2548	12463	12837	13773	24832	22645	9718	2875	8944	8985
Eden	39591	1660	1636	7110	12623	16520	21602	17945	5195	1340	11736	6153
Ehlanzeni	120044	8686	9384	39150	30610	31789	61220	58415	30693	7836	22336	18877
Ekurhuleni	203198	18900	11570	58844	57670	55677	108115	94121	27868	9572	40692	32476
eThekweni	208860	11714	15896	60363	56778	63599	108901	99612	36500	10603	54219	26095
Fezile Dabi	47304	3906	2313	12114	14325	14606	24825	22427	7973	3761	11764	9703
Frances Baard	25952	1968	1353	6699	8167	7735	13608	12262	4565	1429	5236	4324
Gert Sibande	87982	8986	6614	27476	24070	20655	45452	42331	18191	5944	15087	16244
Greater Sekhukhune	78465	5953	4870	20822	19659	27107	38346	39950	15087	5043	17382	19615
iLembe	43433	3228	4018	13290	10886	11874	22230	21080	11212	2778	8705	5430
Joe Gqabi	38654	2366	2516	10092	10514	13117	19463	19106	6485	1631	6279	5270
John Taolo Gaetsewe	23835	3196	1487	6481	6638	6006	12519	11281	4179	984	3243	4236
Lejweleputswa	71294	6959	4131	20364	22011	17729	37680	33440	11710	4611	13553	15547
Mangaung	65510	4601	3698	18411	19426	19286	34082	31211	10003	3508	10672	10918
Mopani	81225	9593	5022	21350	20162	24990	40004	41041	15457	6485	10715	13151
Namakwa	9355	409	357	1600	2955	4025	5136	4215	734	331	2639	1363
Nelson Mandela Bay	71893	3652	3780	17388	22878	24112	37494	34242	12792	3921	18941	9313
Ngaka Modiri Molema	75141	7979	4242	20552	20778	21486	39471	35433	12415	4014	15738	14234
Nkangala	84672	6122	5262	24585	25107	23430	44168	40261	13898	5644	19156	17176
O.R.Tambo	98749	5531	10515	30965	23136	28517	49350	49073	19134	3778	11387	10643
Overberg	18059	872	859	3231	5333	7727	10232	7803	2032	614	5092	2508
Pixley ka Seme	28010	2100	1498	6901	9130	8345	14464	13463	4694	1433	6539	5206
Sedibeng	84263	6616	4651	22218	26103	24522	45144	38882	14084	5011	20157	16576

Sisonke	45969	3387	4161	14416	11719	12192	23051	22798	9581	2882	8060	6935
Siyanda	22974	1848	1224	5987	7254	6635	12309	10624	3886	1083	4611	4573
Thabo Mofutsanyane	84847	8172	4939	24896	24172	22546	42956	41751	15299	6337	18167	19101
Ugu	78163	5121	6657	22888	18814	24576	39957	38086	17041	4883	16246	12280
UMgungundlovu	77883	3584	5421	23499	21066	24213	39769	37928	14242	5252	19067	11338
Umkhanyakude	38560	3575	3456	12360	8391	10655	19287	19026	10079	2123	5812	3773
Umzinyathi	44574	4136	3683	12611	10880	13127	22002	22441	9103	2769	8887	6692
Uthukela	59353	4933	4654	18520	15338	15828	30199	29046	14065	3764	13410	9265
Uthungulu	59743	4650	5211	18834	14743	16063	30580	28998	13138	3404	10604	7594
Vhembe	67458	6732	3988	15242	16956	24416	33214	34121	10840	5747	9305	7741
Waterberg	43377	4316	2458	11391	10994	14178	22475	20837	6967	3078	8572	7647
West Coast	28388	1360	1332	5497	9340	10818	15868	12485	4054	959	7965	4079
West Rand	73212	6230	3984	20559	21688	20502	39858	32921	10930	3154	14991	12123
Xhariep	22514	1618	1142	6045	6821	6866	11783	10686	3395	1200	4278	4672
Zululand	63175	6405	5738	20544	14649	15668	31531	31451	16065	3522	9593	9057
TOTAL	3757736	284191	241646	1 021421	1037409	1165724	1953132	1793663	657170	207084	783637	603994

Table S4. Descriptive statistics corresponding to drought conditions measured by weekly SPEI calculated at short-, medium-, long-, and very long- term (SPEI1,6,12,15, respectively) and weekly mean temperature for each district municipality and province of South Africa and overall, between 2009 and 2016. D= number of weeks with drought; I: moderate drought conditions; II: severe drought conditions; III: Extreme drought conditions. The average total number of weeks with drought conditions ranged from 103 using the SPEI1 to 126 using the SPEI12 across the 8 years in South Africa. This trend was highly consistent across most provinces, with some variations at the district municipality level. Regardless of the time scale of the SPEI used, moderate drought was the most common event, followed by severe drought, and extreme drought. Drought conditions seemed to be more frequent in provinces of Northwest (e.g., Dr. Kenneth Kaunda, Ngaka Modiri Molema), Free State (e.g., Thabo Mofutsanyane, Fezile Dabi), and Gauteng (e.g., Sedibeng, West Rand, City of Johannesburg), while in provinces of Limpopo (e.g., Capricorn, Vhembe, Greater Sekhukhune) and Western Cape (e.g., West Coast, Overberg) the number of events was lower. Extreme conditions of short- and medium-term droughts were particularly frequent in the district municipalities of Frances Baard (Northern Cape), Amajuba, uMzinyathi, and uThukela (Kwazulu-Natal). The frequency of extreme conditions of long- and very long-term droughts was particularly high in Cacadu and Nelson Mandela Bay (Eastern Cape) as well as in most of those located in the provinces of Free State, Northwest, and Gauteng. The average mean temperature in South Africa during the studied period was 17.8°C, with variations from 13.8°C in Joe Gqabi (Eastern Cape) and 22°C in Umkhanyakude (Kwazulu-Natal).

Province	District Municipality	SPEI1 (weeks)				SPEI6 (weeks)				SPEI12 (weeks)				SPEI5 (weeks)				Tmean (°C); (min, max)
		D	I	II	III	D	I	II	III	D	I	II	III	D	I	II	III	
Western Cape	West Coast	78	35	19	24	80	49	19	12	86	43	30	13	74	29	29	16	17.6 (9.1, 28.4)
	Cape Winelands	87	44	25	18	96	58	24	14	101	53	47	1	101	61	24	16	16.1 (6.9, 26.3)
	Overberg	90	39	30	21	96	67	27	2	77	49	25	3	63	39	21	3	16.3 (9, 24.9)
	Eden	90	38	27	25	120	53	48	19	115	40	36	39	106	29	30	47	16.1 (8, 25)
	Central Karoo	93	50	24	19	118	70	31	17	142	65	58	19	128	61	37	30	16.6 (5.6, 26)
	City of Cape Town	88	44	26	18	120	81	27	12	125	77	43	5	132	71	57	4	16.6 (9.7, 26.6)
	Total (average)	87.7	41.7	25.2	20.8	105	63	29.3	12.7	107.7	54.5	39.8	13.3	100.7	48.3	33	19.3	16.5 (8.1, 26.2)
Northern Cape	Namakwa	81	44	21	16	65	48	11	6	89	71	18	0	91	75	14	2	17.7 (7.2, 28.1)
	Pixley ka Seme	86	40	21	25	101	46	29	26	109	50	47	12	110	40	52	18	17.9 (5.1, 29.6)
	Siyanda	90	43	21	26	108	50	35	23	124	85	34	5	119	65	42	12	20.6 (7.2, 32.1)

	Frances Baard	113	52	33	28	156	77	46	33	168	70	59	39	160	62	50	48	19 (6.1, 31.2)
	John Taolo Gaetsewe	103	51	29	23	117	53	33	31	123	26	70	27	125	36	50	39	19.9 (7.1, 32.1)
	Total (average)	94.6	46	25	23.6	109.4	54.8	30.8	23.8	122.6	60.4	45.6	16.6	121	55.6	41.6	23.8	19 (6.5, 30.6)
Eastern Cape	Cacadu	93	48	22	23	134	70	38	26	141	27	69	45	113	21	30	62	16.8 (7.6, 25.89)
	Amathole	91	54	17	20	103	45	46	12	138	87	46	5	115	66	42	7	16.7 (8.8, 24.2)
	Chris Hani	99	51	26	22	110	60	28	22	119	58	37	24	139	91	35	13	15 (4.5, 23.5)
	Joe Gqabi	101	47	30	24	109	53	33	23	118	60	20	38	113	63	3	47	13.8 (2.1, 23.2)
	O.R.Tambo	104	56	29	19	106	55	36	15	124	71	51	2	129	81	42	6	16.8 (9.4, 23.8)
	Alfred Nzo	104	48	37	19	111	43	42	26	147	87	36	24	145	73	67	5	14.9 (4.4, 22.3)
	Nelson Mandela Bay	85	40	23	22	108	57	19	32	135	43	30	62	135	44	33	58	18 (11.5, 25)
	Buffalo City	90	55	19	16	105	52	41	12	129	62	55	12	102	31	59	12	18.1 (11.3, 24.9)
	Total (average)	95.9	49.9	25.4	20.6	110.8	54.4	35.4	21	131.4	61.9	43	26.5	123.9	58.8	38.9	26.25	16.3 (7.5, 24.1)
Free State	Xhariep	108	57	29	22	125	69	32	24	128	64	25	39	137	69	17	51	16.9 (4.2, 28.9)
	Lejweleputswa	114	59	38	17	147	88	39	20	179	97	45	37	165	75	38	52	18 (5.6, 30)
	Thabo Mofutsanyane	130	73	33	24	155	72	54	29	179	105	28	46	208	146	9	53	14.9 (3.8, 24.7)
	Fezile Dabi	136	80	34	22	173	81	61	31	171	68	54	49	196	109	31	56	17 (5.6, 27.5)
	Mangaung	108	55	34	19	131	78	27	26	173	107	29	37	172	98	21	53	17.1 (4.3, 29.4)
		Total (average)	119.2	64.8	33.6	20.8	146.2	77.6	42.6	26	166	88.2	36.2	41.6	175.6	99.4	23.2	53
North West	Bojanala	125	77	30	18	139	78	34	27	149	77	31	41	144	74	18	52	19.6 (8, 29.7)
	Ngaka Modiri Molema	125	74	36	15	189	131	38	20	179	51	89	39	172	48	75	49	18.7 (6.7, 29.7)
	Dr Ruth Segomotsi Mompati	106	53	33	20	149	89	39	21	156	72	49	35	140	48	43	49	19.5 (7.2, 31.4)
	Dr Kenneth Kaunda	131	76	38	17	178	100	57	21	180	70	67	43	182	86	38	58	17.9 (6.1, 29)
		Total (average)	121.8	70	34.3	17.5	163.8	99.5	42	22.3	166	67.5	59	39.5	159.5	64	43.5	52
	Mopani	108	56	34	18	90	40	25	25	78	27	11	40	82	32	13	37	21.7 (13.5, 29.2)
	Vhembe	89	48	26	15	72	40	18	14	51	6	34	11	52	14	35	3	21.7 (13, 30)

Limpopo	Capricorn	78	44	20	14	74	42	17	15	51	7	41	3	44	13	31	0	19.9 (10.1, 28.4)
	Waterberg	94	53	23	18	92	49	21	22	79	30	21	28	84	35	7	42	20.4 (9.2, 29.7)
	Greater Sekhukhune	84	45	26	13	67	31	17	19	53	9	30	14	61	15	42	4	18.9 (8.6, 26.3)
	Total (average)	90.6	49.2	25.8	15.6	79	40.4	19.6	19	62.4	15.8	27.4	19.2	64.6	21.8	25.6	17.2	20.5 (10.9, 28.7)
Mpumalanga	Gert Sibande	124	67	32	25	139	72	35	32	124	58	21	45	116	47	19	50	15.4 (5.4, 22.8)
	Nkangala	107	61	24	22	119	79	19	21	116	65	24	27	93	34	17	42	16.4 (5.9, 24.5)
	Ehlanzeni	115	58	38	19	109	47	32	30	120	49	27	44	113	40	25	48	20.1 (12, 26.5)
	Total (average)	115.3	62	31.3	22	122.3	66	28.7	27.7	120	57.3	24	38.7	107.3	40.3	20.3	46.7	17.3 (7.8, 24.6)
Gauteng	Sedibeng	129	66	41	22	168	88	55	25	154	52	53	49	166	83	26	57	16.6 (5.4, 25.7)
	West Rand	135	76	40	19	177	113	38	26	155	60	46	49	178	99	25	54	17 (5.8, 26.7)
	Ekurhuleni	123	71	31	21	143	96	25	22	128	66	21	41	101	33	13	55	16.4 (5.6, 25.2)
	City of Johannesburg	128	74	36	18	154	105	25	24	130	58	29	43	117	50	14	53	16.5 (5.6, 25.4)
	City of Tshwane	113	69	27	17	102	68	14	20	119	68	26	25	87	28	24	35	18.2 (7.4, 27)
	Total (average)	125.6	71.2	35	19.4	148.8	94	31.4	23.4	137.2	60.8	35	41.4	129.8	58.6	20.4	50.8	16.9 (6, 26)
Kwazulu Natal	Ugu	86	45	20	21	92	53	30	9	88	45	43	0	83	59	24	0	18.3 (11.8, 24.5)
	UMgungundlovu	90	40	29	21	110	63	22	25	129	77	39	13	137	78	56	3	15.5 (6.8, 22.2)
	Uthukela	102	45	28	29	128	59	36	33	140	80	19	41	135	72	13	50	15.8 (5.8, 23.1)
	Umzinyathi	106	53	23	30	145	64	48	33	167	87	35	45	138	47	40	51	17.3 (8.4, 24.3)
	Amajuba	123	57	32	34	142	52	42	48	172	81	38	53	180	86	37	57	15.9 (6.1, 22.8)
	Zululand	92	51	22	19	84	39	21	24	96	51	13	32	83	34	30	19	18.3 (10.2, 24.6)
	Umkhanyakude	91	50	28	13	81	41	14	26	80	37	16	27	84	36	27	21	22 (15.8, 27)
	Uthungulu	88	49	24	15	112	65	36	11	117	75	42	0	117	76	40	1	19.8 (12.8, 25.9)
	iLembe	98	56	26	16	114	64	38	12	129	88	41	0	118	85	33	0	19.5 (12.6, 25.8)
	Sisonke	92	47	31	14	109	57	30	22	117	73	31	13	128	91	37	0	14.2 (4.6, 21.1)
	eThekwini	97	59	18	20	103	62	29	12	135	100	33	2	126	97	29	0	19.3 (12.7, 25.1)
	Total (average)	96.8	50.18	25.5	21.1	110.9	56.3	31.5	23.2	124.5	72.2	31.8	20.5	120.8	69.2	33.3	18.4	17.8 (9.8, 24.2)
Country	District municipality	SPEI1 (weeks)				SPEI6 (weeks)				SPEI12 (weeks)				SPEI5 (weeks)				Tmean (°C); (min, max)
		D	I	II	III	D	I	II	III	D	I	II	III	D	I	II	III	
South Africa	Overall (52)	103	54 (52.4%)	28 (27.2%)	20 (19.4%)	119	65 (54.6%)	32 (26.9%)	22 (18.5%)	126	61 (48.4%)	38 (30.2%)	27 (21.4%)	122	59 (48.4%)	32 (26.2%)	31 (25.4%)	17.8 (7.6, 26.9)

Table S5. Overall drought-related mortality association (relative risks (RR), and 95% confidence intervals) by types of droughts based on its accumulation period (short-, medium-, long-, very long- term droughts) in South Africa between 2009 and 2016. Results are indicated for the total population and for each group of sex and age, and cause of mortality. SPEI_{1,6,12,15}= Standardized Precipitation Evapotranspiration Index measured at 1,6,12, and 15 months of accumulation, respectively. A00-B00= mortality due to certain infectious and parasitic diseases; E00-E90= mortality due to endocrine, metabolic, and nutritional causes; I00-I99= mortality due to circulatory conditions; J00-J99= mortality due to respiratory conditions.

Groups of study	SPEI1	SPEI6	SPEI12	SPEI15
All ages (all-cause mortality)	RR: 1.027 [1.018, 1.036]	RR: 1.035 [1.021, 1.050]	RR: 1.033 [1.008, 1.058]	RR: 1.098 [1.068, 1.129]
Children (0-4 years)	RR: 1.032 [1.01, 1.055]	RR: 1.038 [1.000, 1.078]	RR: 1.027 [0.951, 1.108]	RR: 1.124 [1.048, 1.207]
Pre-adults (5-24 years)	RR: 1.032 [1.009, 1.055]	RR: 1.027 [0.99, 1.065]	RR: 1.016 [0.96, 1.075]	RR: 1.106 [1.021, 1.199]
Younger adults (25-44 years)	RR: 1.047 [1.034, 1.06]	RR: 1.037 [1.016, 1.058]	RR: 1.032 [1.002, 1.064]	RR: 1.106 [1.062, 1.151]
Middle-aged adults (45-64 years)	RR: 1.034 [1.022, 1.047]	RR: 1.046 [1.028, 1.066]	RR: 1.038 [1.010, 1.068]	RR: 1.089 [1.051, 1.128]
The elderly (65-105)	RR: 1.02 [1.008, 1.032]	RR: 1.041 [1.023, 1.059]	RR: 1.054 [1.027, 1.083]	RR: 1.103 [1.069, 1.139]
Males	RR: 1.034 [1.023, 1.045]	RR: 1.034 [1.018, 1.051]	RR: 1.032 [1.003, 1.062]	RR: 1.095 [1.061, 1.131]
Females	RR: 1.021 [1.01, 1.031]	RR: 1.037 [1.021, 1.053]	RR: 1.034 [1.010, 1.059]	RR: 1.1 [1.065, 1.135]
A00-B99	RR: 1.013 [0.998, 1.029]	RR: 1.016 [0.993, 1.040]	RR: 0.993 [0.955, 1.033]	RR: 1.037 [0.995, 1.08]
E00-E90	RR: 1.01 [0.987, 1.032]	RR: 1.058 [1.023, 1.094]	RR: 1.010 [0.960, 1.061]	RR: 1.09 [1.023, 1.161]
I00-I99	RR: 1.032 [1.019, 1.046]	RR: 1.035 [1.015, 1.056]	RR: 1.051 [1.018, 1.086]	RR: 1.097 [1.052, 1.144]
J00-J99	RR: 1.037 [1.021, 1.053]	RR: 1.059 [1.035, 1.083]	RR: 1.07 [1.026, 1.115]	RR: 1.189 [1.140, 1.241]

Table S6. Coefficients, relative risks (RRs), 95% confidence intervals, and p-values obtained in the metanalytical model for A) different levels of urbanicity (“Other” and “Urban) using as reference the “Rural” level, and B) a multidimensional poverty index (MPI) in South Africa. * p<0.05; # tendency to be significant (p<0.07).

A) Urbanicity level	ALL	<5	5-24	25-44	45-64	≥65	males	females	A00B99	E00E90	I00I99	J00J99
SPEI1												
«Rural» Coefficients	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference
RRs [95%CI]	1.026 [0.751, 1.402]	0.996 [0.996, 0.996]	1.034 [0.724, 1.477]	1.055 [0.671, 1.657]	1.034 [0.724, 1.476]	1.021 [0.769, 1.357]	1.03 [0.735, 1.444]	1.023 [0.762, 1.373]	1.009 [0.842, 1.208]	1.015 [0.797, 1.294]	1.023 [0.761, 1.376]	1.039 [0.707, 1.527]
«Other» Coefficients	-0.0003 [-0.022, 0.022] p=0.981	0.056 [0.003, 0.110]* p=0.040	-0.004 [-0.057, 0.050] p=0.891	-0.015 [-0.046, 0.016] p=0.348	-0.005 [-0.036, 0.026] p=0.737	-0.003 [-0.031, 0.025] p=0.848	0.003 [-0.022, 0.029] p=0.799	-0.005 [-0.030, 0.020] p=0.675	0.003 [-0.036, 0.041] p=0.881	-0.010 [-0.064, 0.045] p=0.725	0.004 [-0.029, 0.038] p=0.975	0.004 [-0.035, 0.043] p=0.832
RRs [95%CI]	1.025 [0.752, 1.399]	1.054 [0.672, 1.653]	1.03 [0.736, 1.441]	1.039 [0.708, 1.524]	1.028 [0.742, 1.425]	1.018 [0.781, 1.327]	1.034 [0.724, 1.476]	1.017 [0.787, 1.316]	1.011 [0.82, 1.247]	1.005 [0.87, 1.162]	1.028 [0.743, 1.421]	1.044 [0.696m 1.566]
«Urban» Coefficients	0.008 [-0.017, 0.033] p=0.537	0.048 [-0.007, 0.103] p=0.089	-0.001 [-0.054, 0.052] p=0.969	-0.004 [-0.037, 0.029] p=0.820	0.014 [-0.019, 0.047] p=0.417	0.0001 [-0.030, 0.030] P=0.997	0.012 [-0.016, 0.041] p=0.403	0.002 [-0.026, 0.029] p=0.906	0.015 [-0.026, 0.056] p=0.468	-0.006 [-0.062, 0.049] p=0.819	0.027 [-0.007, 0.060] p=0.122	-0.018 [-0.058, 0.023] p=0.391
RRs [95%CI]	1.034 [0.723, 1.479]	1.045 [0.692, 1.58]	1.033 [0.727, 1.467]	1.051 [0.68, 1.624]	1.048 [0.686, 1.602]	1.021 [0.768, 1.357]	1.043 [0.698, 1.557]	1.025 [0.755, 1.39]	1.024 [0.757, 1.385]	1.009 [0.839, 1.213]	1.051 [0.68, 1.624]	1.021 [0.769, 1.356]
SPEI6												
«Rural» Coefficients	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference
RRs [95%CI]	1.04 [0.707, 1.529]	1.067 [0.648, 1.757]	1.049 [0.683, 1.612]	1.038 [0.711, 1.516]	1.053 [0.674, 1.645]	1.05 [0.682, 1.617]	1.045 [0.692, 1.58]	1.037 [0.714, 1.505]	0.999 [0.999, 0.999]	1.047 [0.689, 1.591]	1.031 [0.733, 1.449]	1.058 [0.665, 1.683]
«Other» Coefficients	-0.005 [-0.039, 0.029] p=0.761	-0.032 [-0.129, 0.064] p=0.515	-0.049 [-0.140, 0.041] p=0.284	0.008 [-0.041, 0.057] p=0.752	-0.012 [-0.058, 0.033] p=0.605	-0.010 [-0.052, 0.033] p=0.664	-0.014 [-0.054, 0.026] p=0.483	0.001 [-0.038, 0.040] p=0.968	0.025 [-0.033, 0.082] p=0.398	-0.010 [-0.093, 0.074] p=0.820	0.010 [-0.041, 0.061] p=0.693	0.010 [-0.049, 0.069] p=0.734
RRs [95%CI]	1.034 [0.722, 1.48]	1.033 [0.725, 1.473]	0.999 [0.999, 0.999]	1.046 [0.689, 1.588]	1.041 [0.704, 1.538]	1.04 [0.706, 1.532]	1.031 [0.734, 1.448]	1.038 [0.712, 1.512]	1.024 [0.757, 1.386]	1.037 [0.715, 1.503]	1.041 [0.702, 1.545]	1.069 [0.645, 1.771]
«Urban» Coefficients	-0.008 [-0.049, 0.032]	-0.054 [-0.156, 0.047]	0.001 [-0.094, 0.096]	-0.022 [-0.076, 0.031]	-0.003 [-0.052, 0.047]	-0.021 [-0.068, 0.026]	-0.019 [-0.065, 0.027]	-0.001 [-0.045, 0.043]	0.025	0.066 [-0.021, 0.154]	-0.001 [-0.055, 0.053]	-0.016 [-0.079, 0.047]

RRs [95%CI]	p=0.688 1.031 [0.732, 1.451]	p=0.294 1.011 [0.827, 1.235]	p=0.978 1.051 [0.68, 1.623]	p=0.414 1.015 [0.799, 1.29]	p=0.909 1.05 [0.681, 1.619]	p=0.388 1.028 [0.742, 1.425]	p=0.414 1.026 [0.751, 1.401]	p=0.952 1.035 [0.718, 1.492]	[-0.037, 0.087]p=0.425 1.025 [0.755, 1.391]	p=0.139 1.118 [0.581, 2.153]	p=0.974 1.03 [0.736, 1.44]	p=0.617 1.041 [0.703, 1.541]
SPEI12												
«Rural» Coefficients	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference
RRs [95%CI]	1.049 [0.682, 1.614]	0.978 [0.978, 0.978]	1.056 [0.669, 1.666]	1.029 [0.738, 1.436]	1.075 [0.634, 1.824]	1.072 [0.64, 1.795]	1.055 [0.671, 1.659]	1.046 [0.691, 1.584]	1.03 [0.734, 1.446]	1.054 [0.671, 1.656]	1.047 [0.687, 1.596]	1.006 [0.861, 1.176]
«Other» Coefficients	-0.031 [-0.090, 0.028] p=0.299	0.077 [-0.116, 0.269] p=0.434	-0.068 [-0.209, 0.074] p=0.348	-0.001 [-0.079, 0.078] p=0.986	-0.061 [-0.132, 0.010] p=0.091	-0.024 [-0.093, 0.045] p=0.499	-0.044 [-0.115, 0.027] p=0.228	-0.019 [-0.078, 0.041] p=0.535	-0.072 [-0.170, 0.025] p=0.145	-0.066 [-0.194, 0.062] p=0.312	0.005 [-0.082, 0.091] p=0.913	0.079 [-0.027, 0.185] p=0.146
RRs [95%CI]	1.017 [0.788, 1.313]	1.056 [0.668, 1.669]	0.987 [0.987, 0.987]	1.029 [0.74, 1.429]	1.011 [0.821, 1.246]	1.047 0.689, 1.59]	1.01 [0.834, 1.222]	1.026 [0.748, 1.408]	0.958 [0.958, 0.958]	0.987 [0.987, 0.987]	1.052 [0.676, 1.638]	1.089 [0.615, 1.928]
«Urban» Coefficients	-0.001 [-0.069, 0.068] p=0.981	0.053 [-0.155, 0.262] p=0.616	-0.029 [-0.173, 0.115] p=0.692	0.013 [-0.069, 0.095] p=0.754	-0.020 [-0.095, 0.055] p=0.607	-0.019 [-0.093, 0.055] p=0.609	0.001 [-0.080, 0.082] p=0.978	-0.007 [-0.072, 0.057] p=0.823	-0.009 [-0.113, 0.094] p=0.861	-0.051 [-0.182, 0.080] p=0.449	0.005 [-0.086, 0.097] p=0.908	0.0982 [-0.015, 0.211] p=0.088
RRs [95%CI]	1.049 [0.684, 1.606]	1.032 [0.73, 1.457]	1.025 [0.752, 1.398]	1.043 [0.698, 1.559]	1.054 [0.672, 1.655]	1.051 [0.678, 1.629]	1.056 [0.668, 1.669]	1.038 [0.71, 1.517]	1.021 [0.771, 1.352]	1.002 [0.911, 1.103]	1.053 [0.675, 1.643]	1.11 [0.589, 2.092]
SPEI15												
«Rural» Coefficients	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference	Category of reference
RRs [95%CI]	1.12 [0.579, 2.167]	1.152 [0.551, 2.41]	1.311 [0.473, 3.638]	1.142 [0.559, 2.332]	1.093 [0.609, 1.961]	1.124 [0.575, 2.195]	1.125 [0.574, 2.205]	1.122 [0.577, 2.182]	1.052 [0.676, 1.637]	1.175 [0.535, 2.578]	1.093 [0.609, 1.959]	1.156 [0.548, 2.438]
«Other» Coefficients [96%CI]	-0.026 [-0.095, 0.042] p=0.452	-0.020 [-0.202, 0.161] p=0.826	-0.250 [-0.419, -0.081]* p=0.004	-0.054 [-0.154, 0.047] p=0.294	0.004 [-0.087, 0.094] p=0.939	-0.026 [-0.106, 0.054] p=0.529	-0.036 [-0.115, 0.043] p=0.372	-0.028 [-0.107, 0.051] p=0.485	-0.035 [-0.139, 0.068] p=0.502	-0.135 [-0.299, 0.029] p=0.106	0.013 [-0.096, 0.122] p=0.814	0.061 [-0.052, 0.173] p=0.291
RRs [95%CI]	1.091 [0.612, 1.945]	1.129 [0.57, 2.235]	1.021 [0.769, 1.357]	1.082 [0.624, 1.878]	1.097 [0.604, 1.99]	1.095 [0.606, 1.978]	1.085 [0.619, 1.902]	1.091 [0.612, 1.946]	1.016 [0.796, 1.296]	1.026 [0.75, 1.403]	1.107 [0.592, 2.069]	1.228 [0.505, 2.986]
«Urban» Coefficients [96%CI]	-0.036 [-0.116, 0.044] p=0.379	-0.055 [-0.233, 0.122] p=0.542	-0.267 [-0.433, -0.101]* p=0.002	-0.034 [-0.139, 0.072] p=0.531	-0.022 [-0.119, 0.075] p=0.653	-0.025 [-0.110, 0.059] p=0.556	-0.046 [-0.133, 0.042] p=0.305	-0.032 [-0.118, 0.055] p=0.475	0.003 [-0.099, 0.105] p=0.953	-0.063 [-0.221, 0.095] p=0.436	-0.008 [-0.125, 0.108] p=0.887	0.003 [-0.109, 0.114] p=0.961
RRs [95%CI]	1.081 [0.626, 1.865]	1.09 [0.613, 1.94]	1.004 [0.887, 1.136]	1.104 [0.596, 2.046]	1.069 [0.644, 1.773]	1.095 [0.606, 1.979]	1.075 [0.635, 1.818]	1.087 [0.617, 1.915]	1.055 [0.669, 1.664]	1.103 [0.597, 2.037]	1.084 [0.622, 1.889]	1.159 [0.546, 2.462]

B) Multidimensional poverty Index (MPDI) (Continuous variable)	ALL	<5	5-24	25-44	45-64	≥65	males	females	A00B99	E00E90	I00I99	J00J99
SPEI1												
Coefficients [95% CI]	-0.154 [-0.595, 0.288] p=0.495	-0.497 [-1.571, 0.578] p=0.365	-0.276 [-1.247, 0.695] p=0.577	-0.075 [-0.681, 0.530] p=0.807	-0.184 [-0.786, 0.417] p=0.548	0.045 [-0.500, 0.590] p=0.872	-0.201 [-0.707, 0.306] p=0.438	-0.082 [-0.576, 0.412] p=0.746	-0.041 [-0.808, 0.727] p=0.918	0.056 [-1.076, 1.188] p=0.923	-0.243 [-0.909, 0.424] p=0.476	0.211 [-0.584, 1.006] p=0.603
RRs [95%CI] Minimum value of the MPDI	1.031 [0.731, 1.456]	1.046 [0.69, 1.587]	1.04 [0.706, 1.531]	1.049 [0.683, 1.611]	1.039 [0.707, 1.527]	1.019 [0.78, 1.331]	1.04 [0.706, 1.532]	1.023 [0.761, 1.374]	1.014 [0.803, 1.282]	1.008 [0.845, 1.202]	1.038 [0.711, 1.517]	1.031 [0.731, 1.454]
RRs [95%CI] Maximum value of the MPDI	1.018 [0.784, 1.322]	1.003 [0.906, 1.11]	1.015 [0.797, 1.294]	1.042 [0.699, 1.553]	1.023 [0.761, 1.375]	1.023 [0.763, 1.371]	1.022 [0.765, 1.367]	1.016 [0.795, 1.299]	1.011 [0.825, 1.239]	1.013 [0.811, 1.265]	1.017 [0.79, 1.309]	1.05 [0.681, 1.619]
SPEI6												
Coefficients [95% CI]	-0.115 [-0.825, 0.594] p=0.750	0.020 [-2.095, 2.134] p=0.986	0.326 [-1.414, 2.065] p=0.714	0.097 [-0.898, 1.093] p=0.848	-0.156 [-1.077, 0.766] p=0.741	0.278 [-0.589, 1.146] p=0.530	0.018 [-0.797, 0.833] p=0.966	-0.149 [-0.944, 0.646] p=0.714	-0.652 [-1.815, 0.511] p=0.272	-1.517 [-3.327, 0.293] p=0.100	0.014 [-1.047, 1.075] p=0.980	-0.272 [-1.524, 0.979] p=0.670
RRs [95%CI] Minimum value of the MPDI	1.038 [0.71, 1.519]	1.038 [0.712, 1.513]	1.018 [0.783, 1.325]	1.034 [0.722, 1.481]	1.051 [0.68, 1.623]	1.033 [0.725, 1.473]	1.034 [0.723, 1.479]	1.041 [0.703, 1.541]	1.034 [0.723, 1.478]	1.1 [0.601, 2.012]	1.035 [0.719, 1.489]	1.066 [0.65, 1.749]
RRs [95%CI] Maximum value of the MPDI	1.028 [0.741, 1.426]	1.039 [0.707, 1.529]	1.047 [0.688, 1.593]	1.043 [0.698, 1.558]	1.037 [0.715, 1.503]	1.058 [0.664, 1.686]	1.036 [0.718, 1.494]	1.028 [0.743, 1.422]	0.978 [0.978, 0.978]	0.966 [0.966, 0.966]	1.036 [0.716, 1.5]	1.041 [0.702, 1.545]
SPEI12												
Coefficients [95% CI]	0.703 [-0.514, 1.921] p=0.703	-1.682 [-5.524, 2.160] p=0.391	1.060 [-1.651, 3.771] p=0.444	-0.01 [-1.567, 1.548] p=0.990	1.230 [-0.196, 2.655] p=0.091	1.620 [0.283, 2.956] p=0.018*	0.767 [-0.699, 2.233] p=0.305	0.731 [-0.487, 1.950] p=0.240	0.072 [-1.966, 2.110] p=0.945	0.398 [-2.393, 3.189] p=0.780	0.973 [-0.767, 2.713] p=0.273	-1.804 [-4.050, 0.442] p=0.619
RRs [95%CI] Minimum value of the MPDI	1.015 [0.802, 1.284]	1.073 [0.638, 1.806]	0.989 [0.989, 0.989]	1.033 [0.727, 1.467]	1.009 [0.837, 1.217]	1.014 [0.803, 1.282]	1.012 [0.815, 1.258]	1.016 [0.73, 1.303]	0.991 [0.991, 0.991]	1 [1-1]	1.029 [0.74, 1.431]	1.117 [0.582, 2.146]
RRs [95%CI] Maximum value of the MPDI	1.077 [0.631, 1.841]	0.929 [0.929, 0.929]	1.083 [0.622, 1.887]	1.032 [0.729, 1.459]	1.121 [0.578, 2.175]	1.165 [0.541, 2.507]	1.081 [0.625, 1.869]	1.082 [0.624, 1.875]	0.997 [0.997, 0.997]	1.035 [0.721, 1.486]	1.118 [0.581, 2.152]	0.957 [0.957, 0.957]

SPEI15

Coefficients [95% CI]	1.187 [-0.055, 2.428] p=0.061#	0.257 [-2.954, 3.467] p=0.875	1.856 [-1.560, 5.272] p=0.287	1.489 [-0.234, 3.212] p=0.090	0.988 [-0.629, 2.606] p=0.231	1.301 [-0.103, 2.705] p=0.069#	0.875 [-0.561, 2.312] p=0.232	1.694 [0.355, 3.034] p=0.013*	1.000 [-0.832, 2.833] p=0.285	1.287 [-1.770, 4.344] p=0.409	1.418 [-0.580, 3.415] p=0.164	0.381 [-1.684, 2.446] p=0.718
RRs [95%CI] Minimum value of the MPDI	1.066 [0.65, 1.746]	1.117 [0.582, 2.144]	1.053 [0.675, 1.641]	1.064 [0.652, 1.736]	1.063 [0.654, 1.729]	1.069 [0.644, 1.777]	1.072 [0.64, 1.794]	1.053 [0.674, 1.644]	1.011 [0.821, 1.246]	1.056 [0.668, 1.669]	1.061 [0.658, 1.713]	1.179 [0.532, 2.61]
RRs [95%CI] Maximum value of the MPDI	1.179 [0.532, 2.615]	1.142 [0.559, 2.332]	1.234 [0.502, 3.031]	1.209 [0.515, 2.84]	1.157 [0.547, 2.448]	1.195 [0.522, 2.736]	1.155 [0.549, 2.43]	1.217 [0.51, 2.904]	1.102 [0.598, 2.029]	1.179 [0.532, 2.612]	1.198 [0.521, 2.759]	1.218 [0.51, 2.907]

Table S7. Relative risks of mortality and 95% confidence intervals associated with short-term droughts (SPEI measured at one month of accumulation, SPEI1) by district municipality in South Africa between 2009 and 2016. Short-term droughts were mostly linked to a higher number of positive associations and robust estimates in the populations of the city of Tshwane (Gauteng), Nkangala, and Gert Sibande (Mpumalanga), where short-term droughts were relatively frequent and/or severe (Table S4).

SPEI1	all	<5 years	5-24 years	25-44 years	45-64 years	65-105 years	males	females	A00B99	E00E90	I00I99	J00J99
Alfred Nzo	1.023 [0.96 - 1.09]	1.074 [0.938 - 1.229]	1.023 [0.943 - 1.11]	1.066 [0.977 - 1.164]	0.981 [0.899 - 1.071]	1.049 [0.973 - 1.131]	1.001 [0.93 - 1.076]	0.964 [0.852 - 1.092]	1.067 [0.852 - 1.337]	1.154 [0.999 - 1.333]	1.023 [0.96 - 1.09]	1.074 [0.938 - 1.229]
Amajuba	0.994 [0.936 - 1.057]	0.976 [0.837 - 1.137]	0.981 [0.897 - 1.074]	1.067 [0.978 - 1.164]	0.93 [0.851 - 1.017]	1.014 [0.941 - 1.093]	0.975 [0.911 - 1.045]	1.038 [0.933 - 1.155]	1.001 [0.86 - 1.165]	0.943 [0.856 - 1.038]	0.994 [0.936 - 1.057]	0.976 [0.837 - 1.137]
Amathole	1.041 [0.984 - 1.1]	1.044 [0.927 - 1.177]	1.061 [0.983 - 1.145]	1.069 [0.998 - 1.145]	1.027 [0.967 - 1.091]	1.044 [0.98 - 1.112]	1.037 [0.977 - 1.101]	1.037 [0.959 - 1.121]	1.038 [0.926 - 1.164]	1.008 [0.937 - 1.086]	1.041 [0.984 - 1.1]	1.044 [0.927 - 1.177]
Bojanala	1.031 [0.966 - 1.1]	0.983 [0.844 - 1.145]	1.045 [0.955 - 1.144]	0.974 [0.901 - 1.053]	1.049 [0.972 - 1.132]	1.027 [0.954 - 1.106]	1.032 [0.964 - 1.106]	1.031 [0.943 - 1.126]	1.104 [0.967 - 1.261]	1.024 [0.945 - 1.11]	1.031 [0.966 - 1.1]	0.983 [0.844 - 1.145]
Buffalo City	1.014 [0.947 - 1.087]	0.985 [0.838 - 1.158]	1.018 [0.929 - 1.114]	1.028 [0.943 - 1.121]	1.019 [0.937 - 1.108]	0.983 [0.908 - 1.064]	1.048 [0.971 - 1.132]	1.034 [0.946 - 1.13]	1.009 [0.844 - 1.207]	1.029 [0.935 - 1.132]	1.014 [0.947 - 1.087]	0.985 [0.838 - 1.158]
Cacadu	1.043 [0.979 - 1.11]	0.986 [0.831 - 1.171]	1.024 [0.929 - 1.127]	1.058 [0.968 - 1.156]	1.052 [0.965 - 1.146]	1.075 [0.997 - 1.16]	1.012 [0.94 - 1.09]	1.022 [0.918 - 1.137]	1.123 [0.944 - 1.337]	1.02 [0.931 - 1.118]	1.043 [0.979 - 1.11]	0.986 [0.831 - 1.171]
Cape Winelands	1.051 [0.986 - 1.12]	1.015 [0.833 - 1.237]	1.091 [0.982 - 1.212]	1.064 [0.982 - 1.152]	1.025 [0.946 - 1.112]	1.067 [0.992 - 1.149]	1.033 [0.956 - 1.116]	0.971 [0.866 - 1.089]	1.135 [0.916 - 1.407]	1.032 [0.942 - 1.131]	1.051 [0.986 - 1.12]	1.015 [0.833 - 1.237]
Capricorn	1.016 [0.943 - 1.095]	0.987 [0.829 - 1.176]	1.026 [0.926 - 1.137]	0.997 [0.907 - 1.097]	1.02 [0.935 - 1.112]	1.022 [0.934 - 1.117]	1.012 [0.935 - 1.096]	1.003 [0.903 - 1.115]	0.938 [0.808 - 1.089]	1.09 [0.976 - 1.217]	1.016 [0.943 - 1.095]	0.987 [0.829 - 1.176]
Central Karoo	1.08 [0.94 - 1.24]	1.387 [0.79 - 2.436]	1.055 [0.806 - 1.38]	1.014 [0.815 - 1.261]	1.158 [0.945 - 1.418]	1.162 [0.972 - 1.389]	0.997 [0.829 - 1.198]	0.981 [0.709 - 1.357]	1.095 [0.563 - 2.131]	1.146 [0.904 - 1.453]	1.08 [0.94 - 1.24]	1.387 [0.79 - 2.436]
Chris Hani	1.012 [0.951 - 1.077]	0.983 [0.851 - 1.134]	1.042 [0.957 - 1.135]	1.018 [0.936 - 1.108]	1.014 [0.942 - 1.093]	1.006 [0.937 - 1.08]	1.017 [0.95 - 1.09]	1.038 [0.945 - 1.141]	1.014 [0.881 - 1.167]	0.975 [0.894 - 1.064]	1.012 [0.951 - 1.077]	0.983 [0.851 - 1.134]
City of Cape Town	1.014 [0.966 - 1.064]	1.031 [0.935 - 1.136]	1.013 [0.95 - 1.08]	1.022 [0.969 - 1.077]	1.022 [0.972 - 1.075]	1.027 [0.975 - 1.082]	0.997 [0.948 - 1.048]	0.994 [0.93 - 1.063]	1.018 [0.919 - 1.128]	1.04 [0.984 - 1.099]	1.014 [0.966 - 1.064]	1.031 [0.935 - 1.136]
City of Johannesburg	1.056 [0.997 - 1.118]	0.997 [0.893 - 1.114]	1.095 [1.022 - 1.173]	1.058 [0.993 - 1.127]	1.028 [0.965 - 1.096]	1.06 [0.997 - 1.127]	1.053 [0.991 - 1.119]	1.034 [0.961 - 1.112]	1.013 [0.895 - 1.147]	1.067 [0.997 - 1.142]	1.056 [0.997 - 1.118]	0.997 [0.893 - 1.114]
City of Tshwane	1.079 [1.018 - 1.144]	1.118 [0.972 - 1.286]	1.071 [0.992 - 1.155]	1.105 [1.031 - 1.183]	1.051 [0.985 - 1.121]	1.102 [1.035 - 1.173]	1.054 [0.99 - 1.123]	1.148 [1.054 - 1.251]	1.062 [0.946 - 1.193]	1.077 [1.004 - 1.154]	1.079 [1.018 - 1.144]	1.118 [0.972 - 1.286]
Dr Kenneth Kaunda	1.056 [0.987 - 1.129]	1.008 [0.83 - 1.224]	1.053 [0.952 - 1.164]	1.046 [0.956 - 1.145]	1.072 [0.981 - 1.172]	1.046 [0.968 - 1.131]	1.071 [0.99 - 1.16]	1.082 [0.977 - 1.198]	1.009 [0.832 - 1.222]	1.061 [0.954 - 1.181]	1.056 [0.987 - 1.129]	1.008 [0.83 - 1.224]

Dr Ruth Segomotsi Mompati	1.028 [0.96 - 1.1]	1.089 [0.895 - 1.325]	1.044 [0.949 - 1.149]	0.992 [0.903 - 1.09]	1.031 [0.945 - 1.124]	1.052 [0.974 - 1.136]	1 [0.924 - 1.082]	1 [0.896 - 1.117]	1.039 [0.868 - 1.244]	0.978 [0.879 - 1.089]	1.028 [0.96 - 1.1]	1.089 [0.895 - 1.325]
Eden	0.982 [0.923 - 1.046]	1.062 [0.869 - 1.298]	0.977 [0.879 - 1.085]	0.957 [0.88 - 1.041]	0.987 [0.911 - 1.069]	0.986 [0.915 - 1.063]	0.979 [0.911 - 1.054]	0.909 [0.803 - 1.029]	0.839 [0.645 - 1.09]	0.945 [0.86 - 1.039]	0.982 [0.923 - 1.046]	1.062 [0.869 - 1.298]
Ehlanzeni	1.008 [0.952 - 1.068]	1.043 [0.922 - 1.179]	1.061 [0.985 - 1.142]	0.967 [0.901 - 1.038]	0.979 [0.916 - 1.047]	1.009 [0.944 - 1.078]	1.008 [0.949 - 1.071]	0.999 [0.924 - 1.081]	1.024 [0.92 - 1.138]	1.012 [0.934 - 1.096]	1.008 [0.952 - 1.068]	1.043 [0.922 - 1.179]
Ekurhuleni	1.046 [0.988 - 1.108]	1.062 [0.95 - 1.186]	1.084 [1.013 - 1.16]	1.06 [0.991 - 1.132]	1.025 [0.96 - 1.095]	1.052 [0.989 - 1.12]	1.038 [0.978 - 1.103]	1.039 [0.96 - 1.124]	1.011 [0.907 - 1.128]	1.047 [0.975 - 1.124]	1.046 [0.988 - 1.108]	1.062 [0.95 - 1.186]
eThekwini	1.014 [0.967 - 1.063]	1.004 [0.929 - 1.086]	1.023 [0.965 - 1.084]	1.036 [0.983 - 1.092]	1.006 [0.952 - 1.063]	1.022 [0.969 - 1.078]	1.004 [0.956 - 1.054]	1.01 [0.951 - 1.072]	1.006 [0.921 - 1.099]	1.004 [0.949 - 1.062]	1.014 [0.967 - 1.063]	1.004 [0.929 - 1.086]
Fezile Dabi	1.051 [0.983 - 1.123]	1.121 [0.906 - 1.387]	1.03 [0.931 - 1.14]	1.091 [0.998 - 1.193]	1.009 [0.926 - 1.099]	1.059 [0.976 - 1.148]	1.042 [0.965 - 1.126]	1.134 [1.004 - 1.28]	0.892 [0.751 - 1.058]	1.092 [0.992 - 1.201]	1.051 [0.983 - 1.123]	1.121 [0.906 - 1.387]
Frances Baard	0.937 [0.863 - 1.018]	0.933 [0.729 - 1.195]	0.959 [0.845 - 1.089]	0.923 [0.827 - 1.031]	0.978 [0.869 - 1.101]	0.918 [0.833 - 1.011]	0.959 [0.864 - 1.065]	0.93 [0.811 - 1.068]	0.926 [0.732 - 1.172]	1.031 [0.903 - 1.177]	0.937 [0.863 - 1.018]	0.933 [0.729 - 1.195]
Gert Sibande	1.063 [1.003 - 1.128]	1.034 [0.905 - 1.18]	1.064 [0.984 - 1.151]	1.105 [1.026 - 1.19]	1.044 [0.972 - 1.121]	1.087 [1.017 - 1.161]	1.04 [0.973 - 1.111]	0.992 [0.91 - 1.082]	1.08 [0.958 - 1.218]	1.045 [0.959 - 1.138]	1.063 [1.003 - 1.128]	1.034 [0.905 - 1.18]
Greater Sekhukhune	1.023 [0.953 - 1.097]	1.046 [0.886 - 1.234]	1.019 [0.924 - 1.125]	1.018 [0.923 - 1.123]	1.042 [0.961 - 1.13]	1.004 [0.923 - 1.091]	1.044 [0.966 - 1.128]	1.014 [0.916 - 1.122]	1.033 [0.887 - 1.203]	1.048 [0.949 - 1.156]	1.023 [0.953 - 1.097]	1.046 [0.886 - 1.234]
iLembe	1.047 [0.988 - 1.11]	1.069 [0.931 - 1.227]	1.047 [0.967 - 1.134]	1.082 [0.999 - 1.171]	1.021 [0.942 - 1.105]	1.027 [0.958 - 1.1]	1.07 [0.999 - 1.146]	1.079 [0.994 - 1.171]	0.972 [0.839 - 1.126]	1.042 [0.955 - 1.137]	1.047 [0.988 - 1.11]	1.069 [0.931 - 1.227]
Joe Gqabi	1.035 [0.965 - 1.11]	1.135 [0.94 - 1.37]	1.014 [0.913 - 1.125]	1.064 [0.962 - 1.176]	1.034 [0.943 - 1.134]	1.045 [0.963 - 1.133]	1.025 [0.944 - 1.114]	1.044 [0.931 - 1.171]	1.064 [0.85 - 1.331]	1.005 [0.887 - 1.138]	1.035 [0.965 - 1.11]	1.135 [0.94 - 1.37]
John Taolo Gaetsewe	1.055 [0.957 - 1.163]	1.132 [0.879 - 1.459]	1.071 [0.925 - 1.239]	1.082 [0.952 - 1.23]	1.033 [0.895 - 1.192]	1.037 [0.93 - 1.157]	1.076 [0.951 - 1.216]	1.099 [0.922 - 1.31]	0.923 [0.675 - 1.263]	1.009 [0.849 - 1.199]	1.055 [0.957 - 1.163]	1.132 [0.879 - 1.459]
Lejweleputswa	1.038 [0.967 - 1.115]	1.012 [0.85 - 1.205]	1.065 [0.963 - 1.179]	1.075 [0.988 - 1.17]	0.966 [0.881 - 1.058]	1.072 [0.989 - 1.163]	0.999 [0.92 - 1.085]	0.87 [0.771 - 0.981]	1.083 [0.924 - 1.271]	1.036 [0.929 - 1.155]	1.038 [0.967 - 1.115]	1.012 [0.85 - 1.205]
Mangaung	1.045 [0.972 - 1.124]	1.101 [0.923 - 1.313]	1.085 [0.986 - 1.195]	1.064 [0.968 - 1.169]	1.011 [0.922 - 1.109]	1.074 [0.991 - 1.164]	1.013 [0.932 - 1.101]	1.012 [0.907 - 1.129]	0.9 [0.76 - 1.066]	1.107 [0.993 - 1.233]	1.045 [0.972 - 1.124]	1.101 [0.923 - 1.313]
Mopani	1.04 [0.976 - 1.108]	0.977 [0.842 - 1.134]	1.111 [1.016 - 1.215]	1.06 [0.97 - 1.158]	1.023 [0.949 - 1.102]	1.02 [0.946 - 1.1]	1.058 [0.988 - 1.132]	1.042 [0.946 - 1.147]	1.009 [0.889 - 1.145]	1.018 [0.922 - 1.123]	1.04 [0.976 - 1.108]	0.977 [0.842 - 1.134]
Namakwa	1.095 [0.97 - 1.234]	0.661 [0.353 - 1.239]	1.298 [1.022 - 1.649]	1.073 [0.897 - 1.283]	1.12 [0.944 - 1.329]	1.086 [0.929 - 1.27]	1.105 [0.941 - 1.296]	1.108 [0.795 - 1.546]	1.542 [0.993 - 2.395]	1.145 [0.939 - 1.396]	1.095 [0.97 - 1.234]	0.661 [0.353 - 1.239]
Nelson Mandela Bay	0.981 [0.908 - 1.06]	0.988 [0.857 - 1.138]	0.949 [0.863 - 1.042]	1.011 [0.926 - 1.105]	0.98 [0.903 - 1.064]	0.992 [0.914 - 1.076]	0.972 [0.896 - 1.054]	0.926 [0.842 - 1.018]	0.941 [0.806 - 1.099]	1.067 [0.98 - 1.162]	0.981 [0.908 - 1.06]	0.988 [0.857 - 1.138]
Ngaka Modiri Molema	1.048 [0.983 - 1.118]	0.988 [0.835 - 1.169]	1.094 [0.997 - 1.2]	1.02 [0.941 - 1.106]	1.026 [0.946 - 1.112]	1.052 [0.976 - 1.134]	1.043 [0.972 - 1.12]	1.06 [0.959 - 1.172]	0.945 [0.809 - 1.104]	1.016 [0.927 - 1.115]	1.048 [0.983 - 1.118]	0.988 [0.835 - 1.169]
Nkangala	1.063 [1 - 1.131]	1.123 [0.953 - 1.323]	1.055 [0.973 - 1.143]	1.039 [0.96 - 1.125]	1.103 [1.023 - 1.188]	1.086 [1.01 - 1.167]	1.038 [0.97 - 1.112]	1.142 [1.039 - 1.256]	1.042 [0.911 - 1.193]	1.061 [0.97 - 1.16]	1.063 [1 - 1.131]	1.123 [0.953 - 1.323]

O.R.Tambo	1.004 [0.948 - 1.063]	1.006 [0.906 - 1.117]	1.001 [0.93 - 1.078]	1.021 [0.951 - 1.097]	1.021 [0.955 - 1.092]	1.023 [0.96 - 1.091]	0.987 [0.928 - 1.049]	0.948 [0.876 - 1.027]	0.974 [0.84 - 1.128]	1.06 [0.964 - 1.166]	1.004 [0.948 - 1.063]	1.006 [0.906 - 1.117]
Overberg	1.067 [0.987 - 1.154]	1.067 [0.806 - 1.412]	1.122 [0.963 - 1.307]	1.066 [0.95 - 1.195]	1.054 [0.949 - 1.17]	1.067 [0.967 - 1.177]	1.071 [0.967 - 1.186]	1.191 [0.995 - 1.425]	0.689 [0.484 - 0.98]	1.149 [1.02 - 1.293]	1.067 [0.987 - 1.154]	1.067 [0.806 - 1.412]
Pixley ka Seme	1.013 [0.931 - 1.103]	1.137 [0.885 - 1.461]	1.074 [0.951 - 1.214]	1.007 [0.896 - 1.133]	0.994 [0.884 - 1.118]	1.002 [0.911 - 1.102]	1.024 [0.922 - 1.137]	0.997 [0.862 - 1.153]	1.119 [0.874 - 1.432]	1.11 [0.981 - 1.255]	1.013 [0.931 - 1.103]	1.137 [0.885 - 1.461]
Sedibeng	1.029 [0.967 - 1.095]	1.035 [0.893 - 1.199]	1.077 [0.986 - 1.177]	1.042 [0.965 - 1.124]	1 [0.925 - 1.082]	1.019 [0.95 - 1.093]	1.047 [0.976 - 1.124]	0.989 [0.897 - 1.09]	0.893 [0.764 - 1.045]	1.005 [0.922 - 1.095]	1.029 [0.967 - 1.095]	1.035 [0.893 - 1.199]
Sisonke	1.03 [0.967 - 1.097]	1.019 [0.886 - 1.172]	1.034 [0.944 - 1.132]	1.01 [0.924 - 1.104]	1.075 [0.988 - 1.169]	1.012 [0.941 - 1.089]	1.049 [0.973 - 1.13]	0.97 [0.878 - 1.071]	0.966 [0.824 - 1.131]	1.053 [0.949 - 1.168]	1.03 [0.967 - 1.097]	1.019 [0.886 - 1.172]
Siyanda	1.027 [0.94 - 1.122]	0.998 [0.744 - 1.34]	1.117 [0.978 - 1.276]	0.985 [0.868 - 1.119]	1.06 [0.933 - 1.204]	0.994 [0.895 - 1.104]	1.071 [0.96 - 1.194]	0.907 [0.765 - 1.075]	1.194 [0.878 - 1.625]	1.065 [0.921 - 1.231]	1.027 [0.94 - 1.122]	0.998 [0.744 - 1.34]
Thabo Mofutsanyane	1.043 [0.982 - 1.108]	0.966 [0.84 - 1.111]	1.112 [1.026 - 1.205]	1.07 [0.992 - 1.153]	1.021 [0.942 - 1.106]	1.051 [0.979 - 1.127]	1.035 [0.97 - 1.105]	0.996 [0.91 - 1.091]	1.032 [0.904 - 1.177]	1.026 [0.942 - 1.119]	1.043 [0.982 - 1.108]	0.966 [0.84 - 1.111]
Ugu	1.035 [0.983 - 1.09]	1.077 [0.968 - 1.199]	1.062 [0.991 - 1.138]	1.064 [0.991 - 1.142]	1.01 [0.947 - 1.077]	1.053 [0.992 - 1.118]	1.017 [0.961 - 1.076]	1.043 [0.972 - 1.12]	0.943 [0.834 - 1.066]	1.006 [0.935 - 1.084]	1.035 [0.983 - 1.09]	1.077 [0.968 - 1.199]
UMgungundlovu	1.034 [0.983 - 1.088]	1.157 [1.033 - 1.296]	1.016 [0.949 - 1.089]	1.082 [1.018 - 1.151]	1.017 [0.954 - 1.084]	1.034 [0.973 - 1.099]	1.037 [0.982 - 1.095]	1.001 [0.924 - 1.086]	0.993 [0.884 - 1.115]	1.026 [0.961 - 1.096]	1.034 [0.983 - 1.088]	1.157 [1.033 - 1.296]
Umkhanyakude	0.988 [0.918 - 1.062]	1.011 [0.841 - 1.215]	1.067 [0.963 - 1.182]	0.947 [0.846 - 1.06]	0.961 [0.868 - 1.064]	1.022 [0.938 - 1.113]	0.952 [0.874 - 1.037]	0.971 [0.876 - 1.076]	1.005 [0.815 - 1.239]	1.02 [0.899 - 1.156]	0.988 [0.918 - 1.062]	1.011 [0.841 - 1.215]
Umzinyathi	1.036 [0.976 - 1.101]	0.95 [0.814 - 1.108]	1.057 [0.966 - 1.158]	1.047 [0.956 - 1.146]	1.082 [1.001 - 1.17]	1.045 [0.973 - 1.123]	1.027 [0.958 - 1.1]	1.096 [0.99 - 1.212]	1.065 [0.913 - 1.242]	1.065 [0.971 - 1.169]	1.036 [0.976 - 1.101]	0.95 [0.814 - 1.108]
Uthukela	0.997 [0.946 - 1.052]	1 [0.88 - 1.136]	1.034 [0.959 - 1.115]	0.971 [0.9 - 1.047]	0.983 [0.918 - 1.053]	0.994 [0.934 - 1.059]	1.001 [0.941 - 1.065]	0.996 [0.925 - 1.073]	1.047 [0.922 - 1.189]	0.95 [0.876 - 1.031]	0.997 [0.946 - 1.052]	1 [0.88 - 1.136]
Uthungulu	0.994 [0.932 - 1.06]	1.006 [0.863 - 1.172]	0.985 [0.897 - 1.081]	0.976 [0.897 - 1.063]	1.042 [0.963 - 1.128]	1.003 [0.929 - 1.082]	0.988 [0.919 - 1.062]	1.008 [0.912 - 1.113]	1.035 [0.881 - 1.217]	1.004 [0.907 - 1.111]	0.994 [0.932 - 1.06]	1.006 [0.863 - 1.172]
Vhembe	0.988 [0.918 - 1.064]	0.965 [0.804 - 1.158]	1.033 [0.92 - 1.16]	1.011 [0.915 - 1.117]	0.949 [0.87 - 1.036]	1.015 [0.929 - 1.108]	0.965 [0.889 - 1.048]	0.952 [0.837 - 1.083]	0.936 [0.8 - 1.095]	1.076 [0.953 - 1.216]	0.988 [0.918 - 1.064]	0.965 [0.804 - 1.158]
Waterberg	1.048 [0.967 - 1.136]	0.95 [0.752 - 1.2]	1.086 [0.96 - 1.228]	1.102 [0.982 - 1.236]	0.985 [0.888 - 1.091]	1.07 [0.973 - 1.177]	1.025 [0.934 - 1.125]	1.012 [0.885 - 1.157]	1.081 [0.883 - 1.323]	1.028 [0.912 - 1.158]	1.048 [0.967 - 1.136]	0.95 [0.752 - 1.2]
West Coast	1 [0.931 - 1.075]	1.492 [1.204 - 1.849]	0.909 [0.795 - 1.04]	0.992 [0.894 - 1.101]	1.012 [0.928 - 1.105]	0.998 [0.916 - 1.086]	1.005 [0.92 - 1.097]	0.871 [0.751 - 1.01]	0.857 [0.65 - 1.129]	1.029 [0.925 - 1.143]	1 [0.931 - 1.075]	1.492 [1.204 - 1.849]
West Rand	1.044 [0.976 - 1.117]	1.008 [0.855 - 1.187]	1.041 [0.948 - 1.144]	1.059 [0.969 - 1.157]	1.057 [0.967 - 1.155]	1.079 [1.003 - 1.16]	1.002 [0.926 - 1.084]	1.005 [0.896 - 1.128]	1.026 [0.852 - 1.235]	1.018 [0.922 - 1.123]	1.044 [0.976 - 1.117]	1.008 [0.855 - 1.187]
Xhariep	0.933 [0.856 - 1.017]	1.043 [0.802 - 1.355]	1.087 [0.967 - 1.223]	0.861 [0.762 - 0.974]	0.891 [0.785 - 1.01]	0.932 [0.841 - 1.032]	0.935 [0.842 - 1.038]	0.959 [0.821 - 1.119]	0.901 [0.692 - 1.172]	0.902 [0.784 - 1.039]	0.933 [0.856 - 1.017]	1.043 [0.802 - 1.355]
Zululand	0.966 [0.908 - 1.027]	0.844 [0.728 - 0.979]	0.971 [0.893 - 1.057]	0.974 [0.894 - 1.06]	1.016 [0.936 - 1.102]	0.97 [0.9 - 1.046]	0.962 [0.898 - 1.031]	0.942 [0.857 - 1.035]	0.954 [0.819 - 1.11]	0.961 [0.869 - 1.063]	0.966 [0.908 - 1.027]	0.844 [0.728 - 0.979]

Table S8. Relative risks of mortality and 95% confidence intervals associated with medium-term droughts (SPEI measured at six months of accumulation, SPEI6) by district municipality in South Africa between 2009 and 2016. A higher number of positive associations and robust estimates were observed across the population of Dr. Kenneth Kaunda (Northwest), being one of the district municipalities where the highest frequency of medium-term drought conditions was recorded (Table S4).

SPEI6	all	<5 years	5-24 years	25-44 years	45-64 years	65-105 years	males	females	A00B99	E00E90	I00I99	J00J99
Alfred Nzo	1.005 [0.886 - 1.139]	0.876 [0.663 - 1.157]	0.992 [0.832 - 1.183]	1.078 [0.913 - 1.272]	0.969 [0.835 - 1.125]	1.046 [0.907 - 1.206]	1.146 [0.898 - 1.463]	0.962 [0.612 - 1.512]	1.256 [0.94 - 1.677]	1.005 [0.886 - 1.139]	0.876 [0.663 - 1.157]	0.992 [0.832 - 1.183]
Amajuba	0.961 [0.88 - 1.05]	0.936 [0.751 - 1.166]	1.025 [0.902 - 1.165]	0.907 [0.796 - 1.034]	0.935 [0.839 - 1.042]	0.993 [0.899 - 1.098]	0.969 [0.831 - 1.13]	1.086 [0.869 - 1.356]	0.928 [0.808 - 1.067]	0.961 [0.88 - 1.05]	0.936 [0.751 - 1.166]	1.025 [0.902 - 1.165]
Amathole	1.079 [0.996 - 1.169]	1.312 [1.107 - 1.554]	1.098 [0.995 - 1.213]	1.044 [0.958 - 1.138]	1.106 [1.01 - 1.21]	1.055 [0.968 - 1.149]	1.029 [0.919 - 1.151]	0.944 [0.798 - 1.116]	1.045 [0.941 - 1.16]	1.079 [0.996 - 1.169]	1.312 [1.107 - 1.554]	1.098 [0.995 - 1.213]
Bojanala	1.103 [0.996 - 1.222]	1.024 [0.801 - 1.31]	1.092 [0.967 - 1.234]	1.075 [0.953 - 1.212]	1.126 [1.002 - 1.265]	1.081 [0.969 - 1.205]	1.108 [0.964 - 1.273]	1.147 [0.929 - 1.416]	0.986 [0.869 - 1.12]	1.103 [0.996 - 1.222]	1.024 [0.801 - 1.31]	1.092 [0.967 - 1.234]
Buffalo City	1.064 [0.965 - 1.174]	1.19 [0.952 - 1.488]	1.007 [0.888 - 1.141]	1.079 [0.956 - 1.218]	1.091 [0.976 - 1.218]	1.036 [0.928 - 1.158]	1.031 [0.91 - 1.169]	1.122 [0.868 - 1.451]	1.096 [0.956 - 1.257]	1.064 [0.965 - 1.174]	1.19 [0.952 - 1.488]	1.007 [0.888 - 1.141]
Cacadu	1.116 [1.035 - 1.205]	1.085 [0.881 - 1.336]	1.104 [0.991 - 1.23]	1.074 [0.967 - 1.193]	1.149 [1.047 - 1.26]	1.08 [0.988 - 1.182]	1.088 [0.956 - 1.239]	0.967 [0.777 - 1.204]	1.097 [0.981 - 1.226]	1.116 [1.035 - 1.205]	1.085 [0.881 - 1.336]	1.104 [0.991 - 1.23]
Cape Winelands	1.073 [0.991 - 1.163]	0.819 [0.636 - 1.055]	1.114 [1.009 - 1.23]	1.038 [0.939 - 1.147]	1.076 [0.98 - 1.18]	1.069 [0.971 - 1.177]	0.996 [0.864 - 1.148]	0.758 [0.569 - 1.011]	1.04 [0.928 - 1.165]	1.073 [0.991 - 1.163]	0.819 [0.636 - 1.055]	1.114 [1.009 - 1.23]
Capricorn	1.015 [0.911 - 1.131]	0.871 [0.679 - 1.118]	1.029 [0.897 - 1.18]	1.003 [0.885 - 1.136]	1.01 [0.888 - 1.149]	1.027 [0.915 - 1.152]	1.015 [0.87 - 1.183]	1.154 [0.937 - 1.42]	1.051 [0.896 - 1.232]	1.015 [0.911 - 1.131]	0.871 [0.679 - 1.118]	1.029 [0.897 - 1.18]
Central Karoo	1.026 [0.892 - 1.181]	0.943 [0.501 - 1.775]	0.98 [0.785 - 1.223]	1.091 [0.886 - 1.344]	1.035 [0.862 - 1.243]	1.012 [0.841 - 1.218]	0.852 [0.61 - 1.191]	1.305 [0.654 - 2.602]	1.067 [0.833 - 1.366]	1.026 [0.892 - 1.181]	0.943 [0.501 - 1.775]	0.98 [0.785 - 1.223]
Chris Hani	1.038 [0.957 - 1.125]	1.085 [0.9 - 1.306]	1.033 [0.927 - 1.151]	1.021 [0.929 - 1.122]	1.028 [0.939 - 1.127]	1.052 [0.961 - 1.15]	1.059 [0.932 - 1.204]	0.896 [0.748 - 1.075]	1.059 [0.949 - 1.181]	1.038 [0.957 - 1.125]	1.085 [0.9 - 1.306]	1.033 [0.927 - 1.151]
City of Cape Town	0.992 [0.921 - 1.068]	0.957 [0.825 - 1.11]	1.011 [0.932 - 1.097]	1.002 [0.926 - 1.083]	1.001 [0.924 - 1.084]	0.979 [0.906 - 1.058]	0.952 [0.858 - 1.056]	1.151 [0.98 - 1.351]	1.018 [0.934 - 1.109]	0.992 [0.921 - 1.068]	0.957 [0.825 - 1.11]	1.011 [0.932 - 1.097]
City of Johannesburg	1.028 [0.943 - 1.12]	1.023 [0.868 - 1.206]	1.069 [0.973 - 1.176]	1.006 [0.915 - 1.106]	1.006 [0.917 - 1.103]	1.055 [0.962 - 1.156]	1.082 [0.969 - 1.208]	1.128 [0.937 - 1.358]	1.019 [0.921 - 1.128]	1.028 [0.943 - 1.12]	1.023 [0.868 - 1.206]	1.069 [0.973 - 1.176]
City of Tshwane	1.071 [0.97 - 1.183]	0.998 [0.787 - 1.265]	1.077 [0.959 - 1.211]	1.078 [0.968 - 1.2]	1.073 [0.964 - 1.193]	1.069 [0.962 - 1.187]	1.031 [0.889 - 1.196]	1.171 [0.967 - 1.419]	1.048 [0.933 - 1.177]	1.071 [0.97 - 1.183]	0.998 [0.787 - 1.265]	1.077 [0.959 - 1.211]
Dr Kenneth Kaunda	1.146 [1.04 - 1.262]	1.284 [0.97 - 1.7]	1.095 [0.961 - 1.247]	1.137 [1 - 1.292]	1.091 [0.975 - 1.221]	1.214 [1.083 - 1.362]	1.167 [1.005 - 1.355]	1.174 [0.89 - 1.549]	1.202 [1.03 - 1.403]	1.146 [1.04 - 1.262]	1.284 [0.97 - 1.7]	1.095 [0.961 - 1.247]

Dr Ruth Segomotsi Mompoti	0.932 [0.821 - 1.058]	1.25 [0.866 - 1.803]	0.907 [0.761 - 1.082]	0.96 [0.815 - 1.131]	0.96 [0.83 - 1.11]	0.895 [0.773 - 1.036]	0.688 [0.563 - 0.842]	0.988 [0.714 - 1.366]	0.954 [0.782 - 1.164]	0.932 [0.821 - 1.058]	1.25 [0.866 - 1.803]	0.907 [0.761 - 1.082]
Eden	0.983 [0.892 - 1.083]	0.93 [0.679 - 1.276]	0.934 [0.819 - 1.065]	0.99 [0.875 - 1.12]	1.058 [0.942 - 1.189]	0.898 [0.802 - 1.006]	0.995 [0.822 - 1.205]	0.873 [0.585 - 1.302]	0.961 [0.83 - 1.112]	0.983 [0.892 - 1.083]	0.93 [0.679 - 1.276]	0.934 [0.819 - 1.065]
Ehlanzeni	1.003 [0.93 - 1.08]	1.067 [0.908 - 1.254]	0.999 [0.911 - 1.095]	0.977 [0.896 - 1.066]	1.034 [0.949 - 1.127]	0.973 [0.898 - 1.054]	1.03 [0.928 - 1.144]	1.031 [0.9 - 1.182]	0.985 [0.887 - 1.094]	1.003 [0.93 - 1.08]	1.067 [0.908 - 1.254]	0.999 [0.911 - 1.095]
Ekurhuleni	1.045 [0.961 - 1.137]	0.938 [0.797 - 1.103]	1.086 [0.985 - 1.197]	1.035 [0.94 - 1.139]	1.039 [0.948 - 1.139]	1.051 [0.962 - 1.148]	1.125 [1.003 - 1.261]	1.08 [0.923 - 1.264]	1.082 [0.975 - 1.2]	1.045 [0.961 - 1.137]	0.938 [0.797 - 1.103]	1.086 [0.985 - 1.197]
eThekweni	1.033 [0.947 - 1.127]	1.127 [0.975 - 1.302]	1.064 [0.965 - 1.173]	1.016 [0.919 - 1.123]	1.038 [0.941 - 1.145]	1.029 [0.941 - 1.124]	1.019 [0.912 - 1.138]	1.087 [0.926 - 1.276]	1.008 [0.911 - 1.115]	1.033 [0.947 - 1.127]	1.127 [0.975 - 1.302]	1.064 [0.965 - 1.173]
Fezile Dabi	1.087 [0.994 - 1.189]	1.002 [0.75 - 1.337]	1.065 [0.944 - 1.202]	1.12 [1.001 - 1.254]	1.087 [0.976 - 1.211]	1.086 [0.979 - 1.206]	0.959 [0.811 - 1.133]	1.212 [0.968 - 1.516]	1.095 [0.963 - 1.244]	1.087 [0.994 - 1.189]	1.002 [0.75 - 1.337]	1.065 [0.944 - 1.202]
Frances Baard	1.104 [0.952 - 1.281]	0.966 [0.622 - 1.499]	1.087 [0.891 - 1.325]	1.257 [1.016 - 1.554]	1.13 [0.949 - 1.345]	1.077 [0.894 - 1.298]	1.253 [0.979 - 1.603]	1.542 [1.015 - 2.341]	1.085 [0.853 - 1.381]	1.104 [0.952 - 1.281]	0.966 [0.622 - 1.499]	1.087 [0.891 - 1.325]
Gert Sibande	1.015 [0.927 - 1.111]	0.896 [0.73 - 1.101]	0.997 [0.889 - 1.118]	1.103 [0.992 - 1.226]	0.999 [0.903 - 1.106]	1.032 [0.933 - 1.143]	1.032 [0.904 - 1.177]	1.161 [0.968 - 1.393]	1.04 [0.913 - 1.184]	1.015 [0.927 - 1.111]	0.896 [0.73 - 1.101]	0.997 [0.889 - 1.118]
Greater Sekhukhune	1.06 [0.939 - 1.198]	0.932 [0.694 - 1.251]	1.137 [0.963 - 1.341]	1.14 [0.992 - 1.312]	1.067 [0.924 - 1.232]	1.056 [0.923 - 1.208]	1.117 [0.941 - 1.325]	1.127 [0.873 - 1.457]	1.044 [0.877 - 1.243]	1.06 [0.939 - 1.198]	0.932 [0.694 - 1.251]	1.137 [0.963 - 1.341]
iLembe	0.954 [0.854 - 1.065]	1.07 [0.827 - 1.384]	1.013 [0.87 - 1.179]	0.999 [0.86 - 1.162]	0.899 [0.79 - 1.022]	1.015 [0.89 - 1.156]	1.008 [0.862 - 1.178]	0.96 [0.732 - 1.26]	1.107 [0.94 - 1.304]	0.954 [0.854 - 1.065]	1.07 [0.827 - 1.384]	1.013 [0.87 - 1.179]
Joe Gqabi	1.037 [0.93 - 1.156]	1.069 [0.79 - 1.446]	1.068 [0.914 - 1.249]	1.02 [0.887 - 1.173]	1.056 [0.931 - 1.198]	1.024 [0.9 - 1.166]	0.998 [0.827 - 1.203]	1.136 [0.806 - 1.601]	0.944 [0.78 - 1.143]	1.037 [0.93 - 1.156]	1.069 [0.79 - 1.446]	1.068 [0.914 - 1.249]
John Taolo Gaetsewe	1.113 [0.943 - 1.315]	1.731 [1.11 - 2.7]	1.225 [0.981 - 1.53]	1.049 [0.821 - 1.341]	1.041 [0.864 - 1.253]	1.202 [0.974 - 1.483]	1.105 [0.821 - 1.487]	0.878 [0.511 - 1.508]	0.912 [0.679 - 1.223]	1.113 [0.943 - 1.315]	1.731 [1.11 - 2.7]	1.225 [0.981 - 1.53]
Lejweleputswa	1.072 [0.961 - 1.195]	1.132 [0.861 - 1.487]	1.03 [0.905 - 1.173]	1.051 [0.92 - 1.201]	1.037 [0.916 - 1.174]	1.114 [0.984 - 1.262]	0.98 [0.812 - 1.181]	0.897 [0.704 - 1.142]	1.048 [0.891 - 1.233]	1.072 [0.961 - 1.195]	1.132 [0.861 - 1.487]	1.03 [0.905 - 1.173]
Mangaung	0.979 [0.874 - 1.098]	1.165 [0.879 - 1.544]	0.977 [0.842 - 1.134]	1.018 [0.888 - 1.167]	0.954 [0.84 - 1.084]	1.004 [0.881 - 1.144]	1.003 [0.839 - 1.201]	1.108 [0.858 - 1.431]	0.926 [0.786 - 1.09]	0.979 [0.874 - 1.098]	1.165 [0.879 - 1.544]	0.977 [0.842 - 1.134]
Mopani	1.047 [0.967 - 1.133]	1.148 [0.961 - 1.371]	0.977 [0.874 - 1.092]	1.054 [0.961 - 1.156]	1.033 [0.94 - 1.134]	1.062 [0.975 - 1.157]	1.038 [0.918 - 1.174]	1.04 [0.893 - 1.211]	1.026 [0.907 - 1.16]	1.047 [0.967 - 1.133]	1.148 [0.961 - 1.371]	0.977 [0.874 - 1.092]
Namakwa	1.184 [0.976 - 1.437]	0.871 [0.338 - 2.241]	1.08 [0.805 - 1.449]	1.233 [0.943 - 1.613]	1.189 [0.925 - 1.527]	1.176 [0.909 - 1.521]	1.171 [0.685 - 2]	1.167 [0.522 - 2.61]	1.431 [1.038 - 1.974]	1.184 [0.976 - 1.437]	0.871 [0.338 - 2.241]	1.08 [0.805 - 1.449]
Nelson Mandela Bay	0.973 [0.848 - 1.117]	1.206 [0.941 - 1.545]	1.058 [0.902 - 1.24]	0.916 [0.788 - 1.064]	0.985 [0.852 - 1.139]	0.96 [0.83 - 1.111]	0.909 [0.771 - 1.073]	0.921 [0.695 - 1.22]	0.981 [0.836 - 1.151]	0.973 [0.848 - 1.117]	1.206 [0.941 - 1.545]	1.058 [0.902 - 1.24]
Ngaka Modiri Molema	1.039 [0.946 - 1.141]	0.94 [0.738 - 1.197]	1.04 [0.926 - 1.168]	1.067 [0.949 - 1.2]	1.005 [0.901 - 1.121]	1.084 [0.979 - 1.201]	0.996 [0.861 - 1.152]	1.025 [0.824 - 1.275]	0.969 [0.849 - 1.106]	1.039 [0.946 - 1.141]	0.94 [0.738 - 1.197]	1.04 [0.926 - 1.168]
Nkangala	1.091 [0.984 - 1.211]	1.269 [0.961 - 1.676]	1.056 [0.926 - 1.205]	1.107 [0.977 - 1.255]	1.088 [0.962 - 1.23]	1.092 [0.975 - 1.223]	1.151 [0.977 - 1.356]	1.002 [0.801 - 1.254]	1.053 [0.906 - 1.223]	1.091 [0.984 - 1.211]	1.269 [0.961 - 1.676]	1.056 [0.926 - 1.205]
O.R.Tambo	0.989 [0.904 - 1.082]	0.974 [0.826 - 1.148]	1.021 [0.913 - 1.143]	0.977 [0.881 - 1.084]	0.998 [0.903 - 1.104]	0.978 [0.889 - 1.077]	0.962 [0.848 - 1.09]	1.03 [0.817 - 1.3]	0.972 [0.836 - 1.129]	0.989 [0.904 - 1.082]	0.974 [0.826 - 1.148]	1.021 [0.913 - 1.143]

Overberg	0.98 [0.851 - 1.128]	0.651 [0.384 - 1.102]	0.939 [0.767 - 1.151]	1.029 [0.855 - 1.24]	0.899 [0.752 - 1.073]	1.09 [0.909 - 1.307]	1.045 [0.749 - 1.458]	0.892 [0.51 - 1.561]	0.953 [0.768 - 1.184]	0.98 [0.851 - 1.128]	0.651 [0.384 - 1.102]	0.939 [0.767 - 1.151]
Pixley ka Seme	0.975 [0.893 - 1.065]	0.89 [0.682 - 1.162]	0.969 [0.858 - 1.095]	0.995 [0.881 - 1.123]	0.924 [0.836 - 1.02]	1.032 [0.926 - 1.15]	0.944 [0.81 - 1.1]	0.986 [0.759 - 1.28]	0.969 [0.85 - 1.105]	0.975 [0.893 - 1.065]	0.89 [0.682 - 1.162]	0.969 [0.858 - 1.095]
Sedibeng	1.072 [0.984 - 1.167]	1.009 [0.823 - 1.237]	1.069 [0.962 - 1.187]	1.127 [1.014 - 1.253]	1.059 [0.962 - 1.166]	1.088 [0.987 - 1.2]	1.18 [1.033 - 1.346]	1.059 [0.854 - 1.313]	1.201 [1.07 - 1.349]	1.072 [0.984 - 1.167]	1.009 [0.823 - 1.237]	1.069 [0.962 - 1.187]
Sisonke	1.1 [0.976 - 1.24]	1.134 [0.867 - 1.482]	0.999 [0.845 - 1.182]	1.275 [1.084 - 1.498]	1.16 [1.011 - 1.33]	1.049 [0.908 - 1.211]	1.005 [0.834 - 1.21]	1.154 [0.855 - 1.557]	1.169 [0.957 - 1.427]	1.1 [0.976 - 1.24]	1.134 [0.867 - 1.482]	0.999 [0.845 - 1.182]
Siyanda	1.029 [0.907 - 1.166]	0.856 [0.567 - 1.292]	1.028 [0.859 - 1.23]	1.104 [0.922 - 1.321]	1.008 [0.869 - 1.169]	1.048 [0.897 - 1.224]	0.961 [0.759 - 1.216]	1.184 [0.763 - 1.836]	1.015 [0.823 - 1.25]	1.029 [0.907 - 1.166]	0.856 [0.567 - 1.292]	1.028 [0.859 - 1.23]
Thabo Mofutsanyane	1.066 [0.975 - 1.165]	0.954 [0.774 - 1.176]	1.14 [1.021 - 1.272]	1.117 [0.996 - 1.253]	1.048 [0.944 - 1.163]	1.085 [0.986 - 1.195]	0.93 [0.813 - 1.064]	1.195 [0.986 - 1.449]	1.13 [0.998 - 1.279]	1.066 [0.975 - 1.165]	0.954 [0.774 - 1.176]	1.14 [1.021 - 1.272]
Ugu	1.049 [0.931 - 1.183]	1.066 [0.832 - 1.366]	1.143 [0.97 - 1.347]	1.082 [0.932 - 1.258]	1.099 [0.956 - 1.263]	0.998 [0.877 - 1.136]	0.993 [0.843 - 1.171]	0.832 [0.629 - 1.1]	1.199 [1.011 - 1.421]	1.049 [0.931 - 1.183]	1.066 [0.832 - 1.366]	1.143 [0.97 - 1.347]
UMgungundlovu	1.006 [0.908 - 1.114]	1.033 [0.817 - 1.306]	1.064 [0.937 - 1.207]	0.988 [0.866 - 1.126]	1.004 [0.889 - 1.135]	1.011 [0.906 - 1.129]	0.97 [0.827 - 1.137]	1.162 [0.922 - 1.464]	0.951 [0.833 - 1.087]	1.006 [0.908 - 1.114]	1.033 [0.817 - 1.306]	1.064 [0.937 - 1.207]
Umkhanyakude	0.905 [0.781 - 1.049]	0.976 [0.664 - 1.433]	0.991 [0.794 - 1.236]	0.807 [0.66 - 0.986]	0.93 [0.781 - 1.107]	0.888 [0.747 - 1.057]	0.89 [0.717 - 1.106]	0.911 [0.598 - 1.388]	0.795 [0.623 - 1.016]	0.905 [0.781 - 1.049]	0.976 [0.664 - 1.433]	0.991 [0.794 - 1.236]
Umzinyathi	1.065 [0.967 - 1.174]	1.088 [0.855 - 1.383]	1.135 [0.981 - 1.312]	1.042 [0.912 - 1.19]	1.121 [0.998 - 1.259]	1.017 [0.91 - 1.137]	1.012 [0.862 - 1.188]	1.022 [0.795 - 1.314]	1.105 [0.943 - 1.293]	1.065 [0.967 - 1.174]	1.088 [0.855 - 1.383]	1.135 [0.981 - 1.312]
Uthukela	0.985 [0.903 - 1.074]	0.912 [0.739 - 1.126]	0.916 [0.809 - 1.037]	0.977 [0.874 - 1.092]	1.006 [0.909 - 1.114]	0.96 [0.868 - 1.062]	0.926 [0.82 - 1.046]	1.047 [0.851 - 1.289]	0.947 [0.83 - 1.081]	0.985 [0.903 - 1.074]	0.912 [0.739 - 1.126]	0.916 [0.809 - 1.037]
Uthungulu	0.984 [0.89 - 1.088]	0.982 [0.771 - 1.251]	0.998 [0.874 - 1.139]	0.991 [0.873 - 1.124]	1.004 [0.89 - 1.131]	0.965 [0.861 - 1.08]	1.063 [0.912 - 1.239]	0.939 [0.724 - 1.218]	1.021 [0.87 - 1.199]	0.984 [0.89 - 1.088]	0.982 [0.771 - 1.251]	0.998 [0.874 - 1.139]
Vhembe	0.965 [0.855 - 1.089]	0.849 [0.63 - 1.144]	1.036 [0.881 - 1.218]	0.991 [0.859 - 1.144]	0.985 [0.853 - 1.138]	0.945 [0.826 - 1.082]	0.859 [0.695 - 1.062]	0.853 [0.662 - 1.099]	1.033 [0.845 - 1.264]	0.965 [0.855 - 1.089]	0.849 [0.63 - 1.144]	1.036 [0.881 - 1.218]
Waterberg	1.039 [0.913 - 1.181]	1.016 [0.704 - 1.468]	1.172 [0.975 - 1.407]	1.011 [0.858 - 1.191]	1.125 [0.966 - 1.31]	0.949 [0.818 - 1.102]	1.036 [0.836 - 1.284]	0.998 [0.727 - 1.371]	0.942 [0.776 - 1.143]	1.039 [0.913 - 1.181]	1.016 [0.704 - 1.468]	1.172 [0.975 - 1.407]
West Coast	0.991 [0.897 - 1.095]	1.274 [0.923 - 1.757]	0.974 [0.843 - 1.126]	0.934 [0.826 - 1.055]	0.981 [0.872 - 1.104]	1.001 [0.886 - 1.132]	1.036 [0.848 - 1.265]	1.255 [0.867 - 1.817]	0.977 [0.844 - 1.131]	0.991 [0.897 - 1.095]	1.274 [0.923 - 1.757]	0.974 [0.843 - 1.126]
West Rand	1.091 [0.989 - 1.202]	1.116 [0.881 - 1.414]	1.164 [1.024 - 1.324]	1.066 [0.938 - 1.212]	1.054 [0.947 - 1.173]	1.133 [1.011 - 1.269]	1.089 [0.921 - 1.287]	1.078 [0.825 - 1.408]	1.074 [0.932 - 1.239]	1.091 [0.989 - 1.202]	1.116 [0.881 - 1.414]	1.164 [1.024 - 1.324]
Xhariep	1.089 [0.939 - 1.264]	0.956 [0.597 - 1.533]	1.095 [0.891 - 1.345]	1.145 [0.928 - 1.413]	1.015 [0.851 - 1.21]	1.179 [0.984 - 1.413]	0.765 [0.584 - 1.002]	1.526 [0.982 - 2.372]	1.21 [0.959 - 1.528]	1.089 [0.939 - 1.264]	0.956 [0.597 - 1.533]	1.095 [0.891 - 1.345]
Zululand	0.968 [0.864 - 1.086]	0.795 [0.609 - 1.037]	1.083 [0.925 - 1.268]	1.068 [0.916 - 1.245]	1.02 [0.888 - 1.173]	0.925 [0.814 - 1.051]	0.921 [0.775 - 1.093]	0.914 [0.685 - 1.22]	0.95 [0.786 - 1.148]	0.968 [0.864 - 1.086]	0.795 [0.609 - 1.037]	1.083 [0.925 - 1.268]

Table S9. Relative risks of mortality and 95% confidence intervals associated with long-term droughts (SPEI measured at twelve months of accumulation, SPEI12) by district municipality in South Africa between 2009 and 2016. Higher imprecision was observed in the estimates for long-term droughts in many district municipalities for the total population compared to other types of droughts. Buffalo City (Eastern Cape) and Umkhanyakude (Kwazulu-Natal) were the most affected locations in terms of death, but the frequency and severity of long-term droughts in these regions were not high (Table S4).

SPEI12	all	<5 years	5-24 years	25-44 years	45-64 years	65-105 years	males	females	A00B99	E00E90	I00I99	J00J99
Alfred Nzo	1.123 [0.929 - 1.356]	1.245 [0.826 - 1.877]	1.156 [0.89 - 1.502]	1.175 [0.908 - 1.52]	1.088 [0.868 - 1.362]	1.163 [0.938 - 1.441]	1.283 [0.897 - 1.833]	1.201 [0.612 - 2.356]	1.141 [0.735 - 1.771]	1.123 [0.929 - 1.356]	1.245 [0.826 - 1.877]	1.156 [0.89 - 1.502]
Amajuba	0.976 [0.861 - 1.107]	1.221 [0.893 - 1.669]	1.028 [0.857 - 1.234]	0.974 [0.812 - 1.167]	0.97 [0.832 - 1.132]	0.994 [0.863 - 1.146]	0.874 [0.701 - 1.088]	1.091 [0.801 - 1.487]	1.12 [0.923 - 1.359]	0.976 [0.861 - 1.107]	1.221 [0.893 - 1.669]	1.028 [0.857 - 1.234]
Amathole	1.088 [0.959 - 1.234]	1.109 [0.846 - 1.454]	1.207 [1.033 - 1.411]	1.025 [0.893 - 1.176]	1.129 [0.979 - 1.302]	1.047 [0.916 - 1.198]	1.202 [1.015 - 1.424]	1.239 [0.949 - 1.618]	1.191 [1.009 - 1.405]	1.088 [0.959 - 1.234]	1.109 [0.846 - 1.454]	1.207 [1.033 - 1.411]
Bojanala	1.106 [0.964 - 1.269]	0.947 [0.684 - 1.311]	1.107 [0.94 - 1.303]	1.141 [0.97 - 1.342]	1.128 [0.965 - 1.319]	1.087 [0.939 - 1.258]	1.051 [0.872 - 1.267]	1.136 [0.857 - 1.507]	1.103 [0.93 - 1.308]	1.106 [0.964 - 1.269]	0.947 [0.684 - 1.311]	1.107 [0.94 - 1.303]
Buffalo City	1.272 [1.125 - 1.439]	1.305 [0.99 - 1.719]	1.228 [1.047 - 1.441]	1.399 [1.198 - 1.634]	1.337 [1.161 - 1.539]	1.21 [1.052 - 1.39]	1.043 [0.893 - 1.218]	1.45 [1.038 - 2.025]	1.464 [1.231 - 1.74]	1.272 [1.125 - 1.439]	1.305 [0.99 - 1.719]	1.228 [1.047 - 1.441]
Cacadu	1.052 [0.939 - 1.177]	1.079 [0.807 - 1.444]	1.05 [0.893 - 1.235]	0.946 [0.806 - 1.11]	1.053 [0.917 - 1.21]	1.051 [0.922 - 1.198]	1.057 [0.879 - 1.272]	0.991 [0.713 - 1.378]	1.094 [0.923 - 1.295]	1.052 [0.939 - 1.177]	1.079 [0.807 - 1.444]	1.05 [0.893 - 1.235]
Cape Winelands	1.032 [0.914 - 1.164]	0.742 [0.505 - 1.09]	1.017 [0.874 - 1.183]	1.072 [0.924 - 1.243]	1.039 [0.903 - 1.196]	1.028 [0.889 - 1.189]	1.105 [0.895 - 1.366]	0.706 [0.462 - 1.081]	1.089 [0.92 - 1.289]	1.032 [0.914 - 1.164]	0.742 [0.505 - 1.09]	1.017 [0.874 - 1.183]
Capricorn	1.156 [0.94 - 1.422]	0.693 [0.427 - 1.123]	1.151 [0.884 - 1.499]	1.201 [0.95 - 1.517]	1.121 [0.874 - 1.438]	1.201 [0.964 - 1.496]	1.173 [0.868 - 1.585]	1.428 [0.97 - 2.101]	1.164 [0.862 - 1.574]	1.156 [0.94 - 1.422]	0.693 [0.427 - 1.123]	1.151 [0.884 - 1.499]
Central Karoo	1.041 [0.872 - 1.241]	0.893 [0.422 - 1.89]	0.948 [0.716 - 1.256]	1.042 [0.802 - 1.355]	1.106 [0.878 - 1.392]	0.968 [0.768 - 1.22]	0.948 [0.632 - 1.421]	1.012 [0.399 - 2.57]	1.155 [0.848 - 1.573]	1.041 [0.872 - 1.241]	0.893 [0.422 - 1.89]	0.948 [0.716 - 1.256]
Chris Hani	0.896 [0.751 - 1.069]	0.841 [0.56 - 1.264]	0.846 [0.668 - 1.072]	1.054 [0.857 - 1.295]	0.821 [0.673 - 1.003]	0.992 [0.817 - 1.206]	0.805 [0.61 - 1.061]	0.728 [0.494 - 1.073]	0.886 [0.696 - 1.127]	0.896 [0.751 - 1.069]	0.841 [0.56 - 1.264]	0.846 [0.668 - 1.072]
City of Cape Town	0.99 [0.875 - 1.12]	0.939 [0.733 - 1.203]	1.012 [0.884 - 1.158]	0.994 [0.873 - 1.131]	0.985 [0.862 - 1.124]	1 [0.88 - 1.137]	0.931 [0.783 - 1.106]	0.973 [0.743 - 1.275]	0.998 [0.866 - 1.15]	0.99 [0.875 - 1.12]	0.939 [0.733 - 1.203]	1.012 [0.884 - 1.158]
City of Johannesburg	1.037 [0.929 - 1.156]	1.06 [0.861 - 1.305]	1.057 [0.937 - 1.192]	1.025 [0.908 - 1.157]	1.023 [0.91 - 1.15]	1.047 [0.932 - 1.176]	1.103 [0.959 - 1.268]	0.905 [0.715 - 1.145]	1.033 [0.907 - 1.175]	1.037 [0.929 - 1.156]	1.06 [0.861 - 1.305]	1.057 [0.937 - 1.192]
City of Tshwane	1.15 [1.006 - 1.316]	1.335 [0.968 - 1.841]	1.166 [0.995 - 1.367]	1.078 [0.93 - 1.249]	1.189 [1.029 - 1.375]	1.106 [0.958 - 1.277]	1.248 [1.022 - 1.525]	1.254 [0.963 - 1.633]	1.027 [0.876 - 1.204]	1.15 [1.006 - 1.316]	1.335 [0.968 - 1.841]	1.166 [0.995 - 1.367]
Dr Kenneth Kaunda	1.002 [0.869 - 1.156]	0.991 [0.656 - 1.498]	1.034 [0.855 - 1.251]	0.991 [0.821 - 1.197]	0.963 [0.816 - 1.135]	1.057 [0.893 - 1.253]	1.131 [0.909 - 1.407]	0.866 [0.583 - 1.287]	0.943 [0.752 - 1.182]	1.002 [0.869 - 1.156]	0.991 [0.656 - 1.498]	1.034 [0.855 - 1.251]

Dr Ruth Segomotsi Mompoti	0.927 [0.778 - 1.105]	1.321 [0.806 - 2.166]	0.78 [0.611 - 0.996]	1.084 [0.864 - 1.359]	0.968 [0.792 - 1.184]	0.881 [0.72 - 1.078]	0.658 [0.496 - 0.874]	0.898 [0.593 - 1.358]	0.965 [0.732 - 1.271]	0.927 [0.778 - 1.105]	1.321 [0.806 - 2.166]	0.78 [0.611 - 0.996]
Eden	0.907 [0.796 - 1.034]	0.902 [0.597 - 1.361]	0.852 [0.714 - 1.016]	0.967 [0.817 - 1.144]	0.913 [0.781 - 1.069]	0.905 [0.777 - 1.055]	0.776 [0.597 - 1.008]	0.923 [0.537 - 1.586]	0.916 [0.751 - 1.116]	0.907 [0.796 - 1.034]	0.902 [0.597 - 1.361]	0.852 [0.714 - 1.016]
Ehlanzeni	1.064 [0.938 - 1.207]	1.264 [0.964 - 1.659]	1.075 [0.92 - 1.256]	1.072 [0.927 - 1.241]	1.093 [0.945 - 1.265]	1.032 [0.902 - 1.18]	1.074 [0.898 - 1.283]	1.099 [0.872 - 1.384]	1.083 [0.911 - 1.288]	1.064 [0.938 - 1.207]	1.264 [0.964 - 1.659]	1.075 [0.92 - 1.256]
Ekurhuleni	1.096 [0.983 - 1.222]	1.056 [0.858 - 1.299]	1.065 [0.939 - 1.208]	1.124 [0.993 - 1.272]	1.097 [0.974 - 1.235]	1.094 [0.976 - 1.226]	1.115 [0.961 - 1.292]	0.967 [0.791 - 1.183]	1.115 [0.975 - 1.275]	1.096 [0.983 - 1.222]	1.056 [0.858 - 1.299]	1.065 [0.939 - 1.208]
eThekwini	0.985 [0.854 - 1.136]	0.879 [0.686 - 1.126]	1.05 [0.894 - 1.233]	0.953 [0.815 - 1.115]	1.013 [0.863 - 1.19]	0.953 [0.823 - 1.104]	1.026 [0.851 - 1.237]	0.922 [0.701 - 1.212]	0.941 [0.801 - 1.105]	0.985 [0.854 - 1.136]	0.879 [0.686 - 1.126]	1.05 [0.894 - 1.233]
Fezile Dabi	0.969 [0.839 - 1.12]	0.715 [0.446 - 1.147]	0.981 [0.808 - 1.19]	1.017 [0.847 - 1.22]	0.991 [0.831 - 1.181]	0.949 [0.803 - 1.123]	0.981 [0.753 - 1.279]	1.028 [0.72 - 1.466]	0.896 [0.73 - 1.1]	0.969 [0.839 - 1.12]	0.715 [0.446 - 1.147]	0.981 [0.808 - 1.19]
Frances Baard	1.103 [0.864 - 1.41]	0.566 [0.276 - 1.158]	1.334 [0.961 - 1.852]	1.018 [0.719 - 1.442]	1.175 [0.881 - 1.568]	1.038 [0.764 - 1.411]	1.191 [0.799 - 1.776]	2.018 [1.001 - 4.069]	1.015 [0.68 - 1.517]	1.103 [0.864 - 1.41]	0.566 [0.276 - 1.158]	1.334 [0.961 - 1.852]
Gert Sibande	1.001 [0.878 - 1.14]	0.976 [0.729 - 1.306]	0.936 [0.793 - 1.103]	1.105 [0.947 - 1.29]	0.951 [0.822 - 1.101]	1.057 [0.914 - 1.223]	0.946 [0.784 - 1.142]	1.215 [0.937 - 1.577]	1.151 [0.953 - 1.391]	1.001 [0.878 - 1.14]	0.976 [0.729 - 1.306]	0.936 [0.793 - 1.103]
Greater Sekhukhune	1.063 [0.869 - 1.3]	1.002 [0.611 - 1.642]	1.155 [0.88 - 1.515]	1.103 [0.878 - 1.387]	1.144 [0.903 - 1.448]	0.989 [0.79 - 1.237]	1.178 [0.874 - 1.586]	1.043 [0.689 - 1.579]	0.887 [0.671 - 1.173]	1.063 [0.869 - 1.3]	1.002 [0.611 - 1.642]	1.155 [0.88 - 1.515]
iLembe	0.977 [0.825 - 1.159]	1.273 [0.843 - 1.924]	1.052 [0.833 - 1.329]	1.106 [0.886 - 1.382]	0.911 [0.746 - 1.111]	1.055 [0.862 - 1.292]	0.938 [0.73 - 1.206]	0.867 [0.583 - 1.288]	1.087 [0.847 - 1.395]	0.977 [0.825 - 1.159]	1.273 [0.843 - 1.924]	1.052 [0.833 - 1.329]
Joe Gqabi	1.059 [0.863 - 1.298]	0.763 [0.437 - 1.331]	1.284 [0.959 - 1.719]	1.017 [0.78 - 1.325]	1.033 [0.814 - 1.31]	1.081 [0.848 - 1.377]	0.894 [0.628 - 1.273]	1.122 [0.59 - 2.136]	1.082 [0.751 - 1.557]	1.059 [0.863 - 1.298]	0.763 [0.437 - 1.331]	1.284 [0.959 - 1.719]
John Taolo Gaetsewe	1.129 [0.857 - 1.489]	1.775 [0.854 - 3.69]	1.198 [0.827 - 1.737]	1.239 [0.815 - 1.882]	1.104 [0.808 - 1.507]	1.16 [0.821 - 1.641]	1.262 [0.79 - 2.014]	0.607 [0.245 - 1.502]	1.079 [0.647 - 1.797]	1.129 [0.857 - 1.489]	1.775 [0.854 - 3.69]	1.198 [0.827 - 1.737]
Lejweleputswa	1.046 [0.875 - 1.251]	0.944 [0.597 - 1.494]	1.005 [0.812 - 1.243]	1.014 [0.817 - 1.259]	1.051 [0.857 - 1.288]	1.035 [0.842 - 1.271]	0.886 [0.651 - 1.206]	1.045 [0.708 - 1.543]	1.117 [0.858 - 1.454]	1.046 [0.875 - 1.251]	0.944 [0.597 - 1.494]	1.005 [0.812 - 1.243]
Mangaung	0.916 [0.751 - 1.116]	1.334 [0.814 - 2.184]	0.942 [0.728 - 1.22]	0.928 [0.73 - 1.18]	0.876 [0.702 - 1.093]	0.963 [0.767 - 1.208]	0.793 [0.585 - 1.077]	0.761 [0.491 - 1.18]	0.954 [0.715 - 1.274]	0.916 [0.751 - 1.116]	1.334 [0.814 - 2.184]	0.942 [0.728 - 1.22]
Mopani	0.951 [0.839 - 1.078]	1.145 [0.856 - 1.532]	0.953 [0.799 - 1.137]	0.984 [0.853 - 1.135]	0.942 [0.813 - 1.092]	0.966 [0.843 - 1.107]	0.935 [0.77 - 1.134]	1.104 [0.872 - 1.397]	1.011 [0.839 - 1.219]	0.951 [0.839 - 1.078]	1.145 [0.856 - 1.532]	0.953 [0.799 - 1.137]
Namakwa	1.441 [1.109 - 1.873]	2.101 [0.636 - 6.941]	1.094 [0.733 - 1.631]	1.46 [1.01 - 2.11]	1.57 [1.114 - 2.213]	1.313 [0.927 - 1.861]	1.171 [0.555 - 2.472]	1.174 [0.377 - 3.659]	1.561 [0.991 - 2.46]	1.441 [1.109 - 1.873]	2.101 [0.636 - 6.941]	1.094 [0.733 - 1.631]
Nelson Mandela Bay	0.87 [0.765 - 0.988]	0.748 [0.593 - 0.943]	0.877 [0.756 - 1.018]	0.918 [0.798 - 1.056]	0.895 [0.781 - 1.025]	0.844 [0.738 - 0.965]	0.875 [0.752 - 1.019]	0.959 [0.734 - 1.252]	0.977 [0.841 - 1.136]	0.87 [0.765 - 0.988]	0.748 [0.593 - 0.943]	0.877 [0.756 - 1.018]
Ngaka Modiri Molema	1.086 [0.951 - 1.242]	0.878 [0.621 - 1.242]	1.122 [0.95 - 1.324]	1.087 [0.919 - 1.285]	1.072 [0.918 - 1.252]	1.101 [0.951 - 1.274]	0.957 [0.78 - 1.175]	0.917 [0.675 - 1.246]	1.154 [0.956 - 1.393]	1.086 [0.951 - 1.242]	0.878 [0.621 - 1.242]	1.122 [0.95 - 1.324]

Nkangala	1.11 [0.963 - 1.279]	1.551 [1.065 - 2.258]	1.086 [0.907 - 1.3]	1.143 [0.962 - 1.357]	1.14 [0.964 - 1.348]	1.077 [0.922 - 1.258]	1.119 [0.896 - 1.398]	0.959 [0.707 - 1.301]	1.164 [0.946 - 1.431]	1.11 [0.963 - 1.279]	1.551 [1.065 - 2.258]	1.086 [0.907 - 1.3]
O.R.Tambo	0.983 [0.84 - 1.15]	0.97 [0.728 - 1.292]	0.936 [0.769 - 1.139]	1.019 [0.848 - 1.224]	0.991 [0.83 - 1.183]	0.975 [0.825 - 1.153]	0.979 [0.788 - 1.218]	0.959 [0.637 - 1.444]	1.227 [0.945 - 1.593]	0.983 [0.84 - 1.15]	0.97 [0.728 - 1.292]	0.936 [0.769 - 1.139]
Overberg	1.105 [0.951 - 1.283]	0.91 [0.519 - 1.594]	1.012 [0.817 - 1.255]	1.148 [0.941 - 1.4]	1.078 [0.894 - 1.3]	1.141 [0.937 - 1.39]	0.853 [0.596 - 1.223]	0.942 [0.513 - 1.731]	1.099 [0.874 - 1.382]	1.105 [0.951 - 1.283]	0.91 [0.519 - 1.594]	1.012 [0.817 - 1.255]
Pixley ka Seme	1.115 [0.931 - 1.335]	1.2 [0.679 - 2.119]	1.099 [0.857 - 1.409]	1.162 [0.914 - 1.478]	1.11 [0.906 - 1.361]	1.129 [0.904 - 1.41]	1.057 [0.755 - 1.479]	1.217 [0.723 - 2.049]	1.009 [0.778 - 1.31]	1.115 [0.931 - 1.335]	1.2 [0.679 - 2.119]	1.099 [0.857 - 1.409]
Sedibeng	0.998 [0.885 - 1.126]	0.921 [0.692 - 1.226]	0.96 [0.828 - 1.113]	1.044 [0.899 - 1.213]	0.963 [0.841 - 1.104]	1.043 [0.908 - 1.198]	0.92 [0.763 - 1.109]	1.059 [0.785 - 1.429]	1.143 [0.969 - 1.347]	0.998 [0.885 - 1.126]	0.921 [0.692 - 1.226]	0.96 [0.828 - 1.113]
Sisonke	1.15 [0.949 - 1.395]	1.105 [0.722 - 1.691]	1.024 [0.783 - 1.339]	1.481 [1.148 - 1.912]	1.237 [0.992 - 1.541]	1.079 [0.856 - 1.36]	1.11 [0.817 - 1.508]	1.245 [0.772 - 2.009]	1.025 [0.751 - 1.4]	1.15 [0.949 - 1.395]	1.105 [0.722 - 1.691]	1.024 [0.783 - 1.339]
Siyanda	0.902 [0.698 - 1.165]	0.629 [0.265 - 1.492]	0.861 [0.598 - 1.239]	0.969 [0.674 - 1.393]	0.888 [0.655 - 1.204]	0.918 [0.67 - 1.259]	0.82 [0.5 - 1.342]	0.881 [0.362 - 2.143]	0.826 [0.548 - 1.247]	0.902 [0.698 - 1.165]	0.629 [0.265 - 1.492]	0.861 [0.598 - 1.239]
Thabo Mofutsanyane	1.042 [0.907 - 1.198]	1.16 [0.838 - 1.605]	1.085 [0.914 - 1.29]	1.102 [0.924 - 1.314]	0.986 [0.839 - 1.159]	1.102 [0.948 - 1.281]	0.887 [0.718 - 1.095]	1.028 [0.765 - 1.38]	1.161 [0.959 - 1.407]	1.042 [0.907 - 1.198]	1.16 [0.838 - 1.605]	1.085 [0.914 - 1.29]
Ugu	1.073 [0.875 - 1.317]	0.776 [0.505 - 1.191]	1.072 [0.81 - 1.418]	1.133 [0.881 - 1.456]	1.102 [0.869 - 1.398]	1.047 [0.84 - 1.306]	1.128 [0.852 - 1.495]	1.536 [0.961 - 2.457]	0.953 [0.715 - 1.269]	1.073 [0.875 - 1.317]	0.776 [0.505 - 1.191]	1.072 [0.81 - 1.418]
UMgungundlovu	0.971 [0.827 - 1.139]	1.007 [0.692 - 1.465]	1.008 [0.828 - 1.228]	0.995 [0.816 - 1.213]	0.961 [0.794 - 1.164]	0.978 [0.824 - 1.162]	0.912 [0.706 - 1.179]	1.104 [0.766 - 1.589]	0.983 [0.803 - 1.204]	0.971 [0.827 - 1.139]	1.007 [0.692 - 1.465]	1.008 [0.828 - 1.228]
Umkhanyakude	1.32 [1.042 - 1.672]	1.911 [1.051 - 3.476]	1.523 [1.062 - 2.183]	1.264 [0.918 - 1.739]	1.348 [1.017 - 1.787]	1.29 [0.978 - 1.702]	1.356 [0.958 - 1.921]	0.989 [0.494 - 1.977]	1.503 [1.016 - 2.226]	1.32 [1.042 - 1.672]	1.911 [1.051 - 3.476]	1.523 [1.062 - 2.183]
Umzinyathi	1.05 [0.92 - 1.199]	0.897 [0.642 - 1.254]	1.139 [0.933 - 1.389]	1.1 [0.925 - 1.307]	1.081 [0.922 - 1.267]	1.02 [0.877 - 1.187]	1.057 [0.845 - 1.322]	0.887 [0.628 - 1.252]	1.005 [0.818 - 1.235]	1.05 [0.92 - 1.199]	0.897 [0.642 - 1.254]	1.139 [0.933 - 1.389]
Uthukela	1.06 [0.932 - 1.205]	1.062 [0.782 - 1.442]	1.047 [0.871 - 1.259]	1.039 [0.881 - 1.225]	1.043 [0.897 - 1.213]	1.078 [0.929 - 1.25]	0.982 [0.819 - 1.177]	0.968 [0.708 - 1.323]	1 [0.821 - 1.218]	1.06 [0.932 - 1.205]	1.062 [0.782 - 1.442]	1.047 [0.871 - 1.259]
Uthungulu	0.907 [0.779 - 1.055]	1.08 [0.741 - 1.575]	0.95 [0.779 - 1.158]	1.018 [0.846 - 1.226]	0.877 [0.732 - 1.051]	0.948 [0.799 - 1.124]	0.891 [0.7 - 1.135]	0.642 [0.444 - 0.929]	0.945 [0.738 - 1.211]	0.907 [0.779 - 1.055]	1.08 [0.741 - 1.575]	0.95 [0.779 - 1.158]
Vhembe	0.91 [0.783 - 1.057]	0.87 [0.6 - 1.261]	0.973 [0.794 - 1.191]	0.969 [0.816 - 1.152]	0.91 [0.76 - 1.089]	0.905 [0.766 - 1.069]	0.833 [0.633 - 1.097]	0.765 [0.567 - 1.034]	0.845 [0.657 - 1.086]	0.91 [0.783 - 1.057]	0.87 [0.6 - 1.261]	0.973 [0.794 - 1.191]
Waterberg	0.977 [0.799 - 1.194]	0.964 [0.539 - 1.724]	1.048 [0.788 - 1.395]	0.963 [0.748 - 1.238]	1.109 [0.873 - 1.408]	0.857 [0.681 - 1.08]	0.775 [0.559 - 1.073]	0.766 [0.477 - 1.231]	0.861 [0.642 - 1.156]	0.977 [0.799 - 1.194]	0.964 [0.539 - 1.724]	1.048 [0.788 - 1.395]
West Coast	0.988 [0.821 - 1.188]	1.396 [0.743 - 2.621]	0.917 [0.702 - 1.198]	0.93 [0.744 - 1.162]	0.947 [0.761 - 1.178]	1.039 [0.828 - 1.304]	1.507 [1.043 - 2.177]	1.132 [0.571 - 2.243]	0.931 [0.709 - 1.221]	0.988 [0.821 - 1.188]	1.396 [0.743 - 2.621]	0.917 [0.702 - 1.198]
West Rand	1.033 [0.919 - 1.162]	0.946 [0.715 - 1.252]	1.106 [0.947 - 1.29]	0.988 [0.846 - 1.155]	0.974 [0.857 - 1.107]	1.113 [0.971 - 1.275]	0.847 [0.695 - 1.033]	1.006 [0.729 - 1.388]	1.021 [0.861 - 1.212]	1.033 [0.919 - 1.162]	0.946 [0.715 - 1.252]	1.106 [0.947 - 1.29]
Xhariep	1.116 [0.857 - 1.454]	1.105 [0.475 - 2.572]	1.049 [0.728 - 1.511]	1.218 [0.839 - 1.77]	1.047 [0.766 - 1.43]	1.213 [0.878 - 1.677]	0.703 [0.434 - 1.139]	0.873 [0.417 - 1.829]	1.404 [0.929 - 1.116]	1.116 [0.857 - 1.454]	1.105 [0.475 - 2.572]	1.049 [0.728 - 1.511]
Zululand	0.976 [0.804 - 1.186]	0.689 [0.439 - 1.082]	1.055 [0.806 - 1.38]	0.971 [0.748 - 1.261]	1.057 [0.835 - 1.337]	0.904 [0.726 - 1.125]	1.075 [0.802 - 1.442]	1.066 [0.655 - 1.735]	0.821 [0.595 - 1.131]	0.976 [0.804 - 1.186]	0.689 [0.439 - 1.082]	1.055 [0.806 - 1.38]

Table S10. Relative risks of mortality and 95% confidence intervals associated with very long-term droughts (SPEI measured at fifteen months of accumulation, SPEI15) by district municipality in South Africa between 2009 and 2016. SPEI15 was associated with a larger and more robust estimates of all-cause mortality risk in the total population compared to other type of droughts.

SPEI15	all	<5 years	5-24 years	25-44 years	45-64 years	65-105 years	males	females	A00B99	E00E90	I00I99	J00J99
Alfred Nzo	0.957 [0.805 - 1.139]	0.792 [0.537 - 1.169]	0.932 [0.732 - 1.187]	1.07 [0.85 - 1.346]	0.944 [0.768 - 1.16]	0.974 [0.8 - 1.186]	1.155 [0.823 - 1.621]	0.704 [0.373 - 1.326]	0.911 [0.612 - 1.356]	0.957 [0.805 - 1.139]	0.792 [0.537 - 1.169]	0.932 [0.732 - 1.187]
Amajuba	1.072 [0.886 - 1.297]	1.275 [0.791 - 2.056]	1.18 [0.896 - 1.554]	0.94 [0.714 - 1.237]	1.038 [0.822 - 1.31]	1.124 [0.906 - 1.394]	1.068 [0.768 - 1.486]	0.791 [0.492 - 1.271]	1.26 [0.936 - 1.695]	1.072 [0.886 - 1.297]	1.275 [0.791 - 2.056]	1.18 [0.896 - 1.554]
Amathole	1.236 [1.079 - 1.417]	1.553 [1.161 - 2.077]	1.282 [1.083 - 1.519]	1.148 [0.99 - 1.332]	1.269 [1.089 - 1.48]	1.204 [1.04 - 1.393]	1.17 [0.967 - 1.415]	1.143 [0.855 - 1.529]	1.177 [0.984 - 1.409]	1.236 [1.079 - 1.417]	1.553 [1.161 - 2.077]	1.282 [1.083 - 1.519]
Bojanala	1.077 [0.911 - 1.274]	1.015 [0.68 - 1.515]	1.037 [0.848 - 1.267]	1.168 [0.959 - 1.422]	1.075 [0.888 - 1.301]	1.078 [0.903 - 1.288]	0.926 [0.736 - 1.166]	1.28 [0.912 - 1.795]	0.999 [0.811 - 1.23]	1.077 [0.911 - 1.274]	1.015 [0.68 - 1.515]	1.037 [0.848 - 1.267]
Buffalo City	1.229 [1.028 - 1.47]	0.987 [0.656 - 1.486]	1.269 [1.013 - 1.59]	1.286 [1.029 - 1.607]	1.302 [1.064 - 1.593]	1.155 [0.943 - 1.415]	1.225 [0.976 - 1.539]	1.023 [0.636 - 1.645]	1.478 [1.154 - 1.893]	1.229 [1.028 - 1.47]	0.987 [0.656 - 1.486]	1.269 [1.013 - 1.59]
Cacadu	1.153 [1.027 - 1.294]	1.113 [0.824 - 1.503]	1.167 [0.988 - 1.379]	1.009 [0.856 - 1.189]	1.2 [1.042 - 1.383]	1.102 [0.963 - 1.261]	1.151 [0.951 - 1.394]	0.963 [0.691 - 1.342]	1.222 [1.029 - 1.452]	1.153 [1.027 - 1.294]	1.113 [0.824 - 1.503]	1.167 [0.988 - 1.379]
Cape Winelands	1.109 [0.975 - 1.262]	0.786 [0.521 - 1.186]	1.23 [1.049 - 1.442]	1.035 [0.882 - 1.213]	1.16 [0.999 - 1.348]	1.048 [0.897 - 1.225]	1.219 [0.971 - 1.529]	0.865 [0.548 - 1.365]	1.02 [0.852 - 1.222]	1.109 [0.975 - 1.262]	0.786 [0.521 - 1.186]	1.23 [1.049 - 1.442]
Capricorn	1.172 [0.745 - 1.844]	1.057 [0.369 - 3.027]	1.458 [0.822 - 2.586]	1.172 [0.704 - 1.952]	1.136 [0.66 - 1.956]	1.209 [0.747 - 1.957]	1.05 [0.537 - 2.052]	0.676 [0.295 - 1.549]	1.661 [0.859 - 3.212]	1.172 [0.745 - 1.844]	1.057 [0.369 - 3.027]	1.458 [0.822 - 2.586]
Central Karoo	1.023 [0.875 - 1.196]	1.454 [0.743 - 2.844]	0.916 [0.714 - 1.176]	1.074 [0.853 - 1.352]	1.052 [0.859 - 1.288]	0.991 [0.807 - 1.219]	0.915 [0.636 - 1.317]	1.366 [0.584 - 3.198]	0.949 [0.721 - 1.247]	1.023 [0.875 - 1.196]	1.454 [0.743 - 2.844]	0.916 [0.714 - 1.176]
Chris Hani	1.167 [0.989 - 1.378]	1.158 [0.789 - 1.699]	1.162 [0.929 - 1.453]	1.16 [0.956 - 1.409]	1.178 [0.976 - 1.421]	1.156 [0.962 - 1.39]	1.026 [0.787 - 1.338]	0.996 [0.683 - 1.453]	1.347 [1.073 - 1.693]	1.167 [0.989 - 1.378]	1.158 [0.789 - 1.699]	1.162 [0.929 - 1.453]
City of Cape Town	1.05 [0.936 - 1.178]	1.027 [0.814 - 1.298]	1.048 [0.923 - 1.189]	1.066 [0.946 - 1.2]	1.029 [0.909 - 1.165]	1.075 [0.954 - 1.211]	1.016 [0.865 - 1.193]	1.116 [0.872 - 1.428]	1.092 [0.958 - 1.244]	1.05 [0.936 - 1.178]	1.027 [0.814 - 1.298]	1.048 [0.923 - 1.189]
City of Johannesburg	1.061 [0.919 - 1.225]	0.97 [0.734 - 1.281]	1.03 [0.878 - 1.208]	1.071 [0.914 - 1.254]	1.026 [0.879 - 1.197]	1.104 [0.947 - 1.286]	0.992 [0.824 - 1.193]	0.979 [0.72 - 1.331]	1.098 [0.928 - 1.3]	1.061 [0.919 - 1.225]	0.97 [0.734 - 1.281]	1.03 [0.878 - 1.208]
City of Tshwane	1.186 [0.972 - 1.448]	1.244 [0.77 - 2.009]	1.181 [0.933 - 1.494]	1.117 [0.9 - 1.386]	1.223 [0.987 - 1.515]	1.14 [0.923 - 1.41]	1.355 [1.007 - 1.823]	1.27 [0.857 - 1.881]	0.985 [0.779 - 1.246]	1.186 [0.972 - 1.448]	1.244 [0.77 - 2.009]	1.181 [0.933 - 1.494]
Dr Kenneth Kaunda	1.213 [0.99 - 1.487]	1.835 [1.011 - 3.333]	1.256 [0.957 - 1.65]	1.233 [0.943 - 1.612]	1.187 [0.938 - 1.502]	1.243 [0.976 - 1.585]	1.151 [0.84 - 1.578]	1.366 [0.766 - 2.435]	0.94 [0.682 - 1.295]	1.213 [0.99 - 1.487]	1.835 [1.011 - 3.333]	1.256 [0.957 - 1.65]
Dr Ruth Segomotsi Mompoti	0.949 [0.752 - 1.199]	1.064 [0.545 - 2.08]	0.912 [0.658 - 1.264]	1.087 [0.804 - 1.47]	0.966 [0.74 - 1.261]	0.924 [0.706 - 1.21]	0.858 [0.587 - 1.252]	0.835 [0.477 - 1.46]	1.018 [0.706 - 1.467]	0.949 [0.752 - 1.199]	1.064 [0.545 - 2.08]	0.912 [0.658 - 1.264]
Eden	0.932 [0.841 - 1.033]	0.775 [0.563 - 1.068]	0.889 [0.773 - 1.022]	1.01 [0.886 - 1.152]	0.979 [0.865 - 1.107]	0.879 [0.779 - 0.992]	0.823 [0.67 - 1.012]	1.157 [0.753 - 1.776]	0.898 [0.769 - 1.049]	0.932 [0.841 - 1.033]	0.775 [0.563 - 1.068]	0.889 [0.773 - 1.022]

Ehlanzeni	1.028 [0.89 - 1.187]	1.129 [0.828 - 1.539]	1.079 [0.904 - 1.288]	1.041 [0.882 - 1.229]	1.093 [0.926 - 1.291]	0.967 [0.83 - 1.127]	1.049 [0.859 - 1.282]	1.08 [0.829 - 1.408]	1.058 [0.868 - 1.289]	1.028 [0.89 - 1.187]	1.129 [0.828 - 1.539]	1.079 [0.904 - 1.288]
Ekurhuleni	1.174 [1.008 - 1.367]	1.237 [0.917 - 1.668]	1.068 [0.894 - 1.276]	1.282 [1.082 - 1.519]	1.193 [1.01 - 1.409]	1.162 [0.99 - 1.362]	1.188 [0.963 - 1.465]	1.208 [0.91 - 1.602]	1.229 [1.021 - 1.479]	1.174 [1.008 - 1.367]	1.237 [0.917 - 1.668]	1.068 [0.894 - 1.276]
eThekwini	1.004 [0.863 - 1.168]	0.785 [0.603 - 1.023]	1.135 [0.958 - 1.345]	0.956 [0.809 - 1.13]	1.015 [0.856 - 1.204]	0.994 [0.852 - 1.16]	1.003 [0.826 - 1.218]	1.001 [0.752 - 1.333]	0.961 [0.81 - 1.141]	1.004 [0.863 - 1.168]	0.785 [0.603 - 1.023]	1.135 [0.958 - 1.345]
Fezile Dabi	1.105 [0.898 - 1.359]	1.456 [0.738 - 2.873]	1.055 [0.798 - 1.394]	1.105 [0.85 - 1.436]	1.218 [0.949 - 1.563]	0.995 [0.781 - 1.267]	0.992 [0.678 - 1.453]	1.28 [0.764 - 2.144]	1.036 [0.773 - 1.39]	1.105 [0.898 - 1.359]	1.456 [0.738 - 2.873]	1.055 [0.798 - 1.394]
Frances Baard	1.017 [0.767 - 1.349]	0.409 [0.179 - 0.935]	1.053 [0.722 - 1.536]	1.193 [0.799 - 1.78]	0.896 [0.643 - 1.249]	1.187 [0.833 - 1.692]	1.085 [0.683 - 1.724]	2.407 [1.081 - 5.359]	1.343 [0.85 - 2.123]	1.017 [0.767 - 1.349]	0.409 [0.179 - 0.935]	1.053 [0.722 - 1.536]
Gert Sibande	1.158 [0.943 - 1.422]	0.932 [0.585 - 1.486]	0.979 [0.754 - 1.273]	1.494 [1.179 - 1.893]	1.049 [0.832 - 1.321]	1.292 [1.029 - 1.624]	0.986 [0.727 - 1.337]	1.183 [0.785 - 1.781]	1.282 [0.954 - 1.723]	1.158 [0.943 - 1.422]	0.932 [0.585 - 1.486]	0.979 [0.754 - 1.273]
Greater Sekhukhune	1.178 [0.779 - 1.782]	1.387 [0.5 - 3.847]	1.178 [0.672 - 2.064]	1.353 [0.848 - 2.157]	1.215 [0.748 - 1.974]	1.149 [0.726 - 1.818]	1.227 [0.661 - 2.276]	1.849 [0.794 - 4.309]	1.029 [0.581 - 1.822]	1.178 [0.779 - 1.782]	1.387 [0.5 - 3.847]	1.178 [0.672 - 2.064]
iLembe	1.229 [0.958 - 1.575]	1.042 [0.559 - 1.945]	1.271 [0.905 - 1.787]	1.355 [0.989 - 1.857]	1.076 [0.803 - 1.441]	1.4 [1.043 - 1.879]	1.264 [0.866 - 1.846]	0.861 [0.487 - 1.521]	1.58 [1.11 - 2.249]	1.229 [0.958 - 1.575]	1.042 [0.559 - 1.945]	1.271 [0.905 - 1.787]
Joe Gqabi	1.224 [0.981 - 1.529]	0.768 [0.412 - 1.431]	1.434 [1.043 - 1.971]	1.276 [0.964 - 1.69]	1.221 [0.945 - 1.579]	1.229 [0.943 - 1.604]	0.884 [0.598 - 1.307]	1.373 [0.678 - 2.781]	1.197 [0.811 - 1.767]	1.224 [0.981 - 1.529]	0.768 [0.412 - 1.431]	1.434 [1.043 - 1.971]
John Taolo Gaetsewe	1.126 [0.831 - 1.525]	2.442 [1.067 - 5.589]	1.17 [0.778 - 1.759]	1.093 [0.696 - 1.715]	0.93 [0.661 - 1.309]	1.391 [0.951 - 2.036]	1.107 [0.657 - 1.865]	0.419 [0.158 - 1.114]	0.995 [0.589 - 1.678]	1.126 [0.831 - 1.525]	2.442 [1.067 - 5.589]	1.17 [0.778 - 1.759]
Lejweleputswa	1.234 [1.004 - 1.517]	1.268 [0.744 - 2.16]	1.162 [0.909 - 1.485]	1.215 [0.944 - 1.564]	1.15 [0.909 - 1.454]	1.332 [1.051 - 1.688]	1.05 [0.734 - 1.502]	1.022 [0.652 - 1.602]	1.157 [0.85 - 1.574]	1.234 [1.004 - 1.517]	1.268 [0.744 - 2.16]	1.162 [0.909 - 1.485]
Mangaung	1.025 [0.819 - 1.283]	0.869 [0.498 - 1.515]	0.99 [0.739 - 1.327]	1.024 [0.777 - 1.349]	0.992 [0.772 - 1.275]	1.067 [0.825 - 1.381]	0.971 [0.686 - 1.375]	1.29 [0.786 - 2.118]	0.899 [0.645 - 1.253]	1.025 [0.819 - 1.283]	0.869 [0.498 - 1.515]	0.99 [0.739 - 1.327]
Mopani	1.132 [0.931 - 1.377]	1.524 [0.974 - 2.384]	0.921 [0.699 - 1.213]	1.333 [1.064 - 1.67]	1.137 [0.902 - 1.432]	1.131 [0.914 - 1.398]	0.984 [0.727 - 1.332]	1.203 [0.817 - 1.771]	1.096 [0.808 - 1.487]	1.132 [0.931 - 1.377]	1.524 [0.974 - 2.384]	0.921 [0.699 - 1.213]
Namakwa	1.343 [1.026 - 1.757]	0.794 [0.22 - 2.867]	1.084 [0.723 - 1.625]	1.412 [0.971 - 2.055]	1.361 [0.958 - 1.935]	1.316 [0.921 - 1.878]	0.838 [0.388 - 1.812]	1.052 [0.349 - 3.177]	1.599 [1.014 - 2.522]	1.343 [1.026 - 1.757]	0.794 [0.22 - 2.867]	1.084 [0.723 - 1.625]
Nelson Mandela Bay	0.923 [0.769 - 1.107]	0.883 [0.632 - 1.234]	0.916 [0.742 - 1.13]	0.956 [0.784 - 1.165]	0.923 [0.761 - 1.121]	0.921 [0.761 - 1.114]	0.941 [0.757 - 1.17]	0.832 [0.573 - 1.207]	1.017 [0.824 - 1.255]	0.923 [0.769 - 1.107]	0.883 [0.632 - 1.234]	0.916 [0.742 - 1.13]
Ngaka Modiri Molema	1.212 [1.009 - 1.456]	1.002 [0.621 - 1.616]	1.091 [0.867 - 1.372]	1.303 [1.039 - 1.634]	1.128 [0.911 - 1.398]	1.311 [1.075 - 1.598]	1.065 [0.8 - 1.418]	1.404 [0.921 - 2.142]	1.21 [0.935 - 1.565]	1.212 [1.009 - 1.456]	1.002 [0.621 - 1.616]	1.091 [0.867 - 1.372]
Nkangala	1.305 [1.015 - 1.678]	2.696 [1.399 - 5.197]	1.158 [0.839 - 1.597]	1.402 [1.037 - 1.896]	1.481 [1.102 - 1.991]	1.132 [0.858 - 1.493]	1.172 [0.784 - 1.751]	1.099 [0.639 - 1.89]	1.317 [0.915 - 1.896]	1.305 [1.015 - 1.678]	2.696 [1.399 - 5.197]	1.158 [0.839 - 1.597]
O.R.Tambo	1.132 [0.997 - 1.286]	1.344 [1.066 - 1.695]	1.102 [0.939 - 1.292]	1.038 [0.895 - 1.203]	1.095 [0.949 - 1.264]	1.173 [1.025 - 1.344]	1.115 [0.931 - 1.335]	1.215 [0.873 - 1.691]	1.1 [0.889 - 1.36]	1.132 [0.997 - 1.286]	1.344 [1.066 - 1.695]	1.102 [0.939 - 1.292]
Overberg	1.157 [0.994 - 1.347]	1.157 [0.655 - 2.044]	1.177 [0.946 - 1.465]	1.149 [0.94 - 1.405]	1.173 [0.97 - 1.419]	1.144 [0.938 - 1.395]	1.09 [0.76 - 1.565]	0.732 [0.394 - 1.361]	1.158 [0.917 - 1.462]	1.157 [0.994 - 1.347]	1.157 [0.655 - 2.044]	1.177 [0.946 - 1.465]
Pixley ka Seme	1.186 [0.991 - 1.418]	1.271 [0.725 - 2.227]	1.159 [0.903 - 1.487]	1.116 [0.877 - 1.42]	1.141 [0.932 - 1.397]	1.23 [0.987 - 1.534]	1.185 [0.855 - 1.641]	1.337 [0.795 - 2.25]	1.019 [0.783 - 1.326]	1.186 [0.991 - 1.418]	1.271 [0.725 - 2.227]	1.159 [0.903 - 1.487]

Sedibeng	1.079 [0.916 - 1.271]	0.963 [0.651 - 1.426]	1.135 [0.928 - 1.389]	1.162 [0.949 - 1.423]	1.073 [0.892 - 1.291]	1.085 [0.899 - 1.309]	0.943 [0.732 - 1.215]	0.996 [0.665 - 1.492]	1.349 [1.08 - 1.686]	1.079 [0.916 - 1.271]	0.963 [0.651 - 1.426]	1.135 [0.928 - 1.389]
Sisonke	1.264 [1.043 - 1.532]	1.098 [0.714 - 1.688]	1.102 [0.842 - 1.443]	1.139 [0.878 - 1.477]	1.387 [1.115 - 1.726]	1.158 [0.918 - 1.46]	1.126 [0.831 - 1.527]	1.529 [0.957 - 2.442]	1.151 [0.838 - 1.579]	1.264 [1.043 - 1.532]	1.098 [0.714 - 1.688]	1.102 [0.842 - 1.443]
Siyanda	0.875 [0.636 - 1.205]	0.557 [0.186 - 1.664]	0.813 [0.514 - 1.283]	0.865 [0.556 - 1.346]	0.943 [0.644 - 1.381]	0.8 [0.541 - 1.184]	0.925 [0.493 - 1.733]	0.558 [0.185 - 1.687]	0.956 [0.578 - 1.583]	0.875 [0.636 - 1.205]	0.557 [0.186 - 1.664]	0.813 [0.514 - 1.283]
Thabo Mofutsanyane	1.114 [0.914 - 1.356]	1.779 [1.118 - 2.834]	1.114 [0.872 - 1.423]	1.084 [0.846 - 1.388]	1.069 [0.849 - 1.345]	1.153 [0.931 - 1.427]	1.085 [0.804 - 1.465]	1.096 [0.715 - 1.68]	1.286 [0.982 - 1.683]	1.114 [0.914 - 1.356]	1.779 [1.118 - 2.834]	1.114 [0.872 - 1.423]
Ugu	1.055 [0.895 - 1.244]	1.085 [0.764 - 1.541]	1.063 [0.848 - 1.332]	0.987 [0.806 - 1.209]	1.104 [0.912 - 1.336]	1.007 [0.843 - 1.205]	1.042 [0.833 - 1.303]	1.096 [0.755 - 1.592]	0.958 [0.759 - 1.21]	1.055 [0.895 - 1.244]	1.085 [0.764 - 1.541]	1.063 [0.848 - 1.332]
UMgungundlovu	1.021 [0.86 - 1.212]	1.409 [0.938 - 2.117]	0.912 [0.738 - 1.128]	1.049 [0.851 - 1.291]	1.041 [0.847 - 1.279]	0.993 [0.825 - 1.195]	0.972 [0.734 - 1.288]	1.039 [0.704 - 1.534]	1.066 [0.859 - 1.324]	1.021 [0.86 - 1.212]	1.409 [0.938 - 2.117]	0.912 [0.738 - 1.128]
Umkhanyakude	1.193 [0.816 - 1.745]	2.889 [1.076 - 7.761]	1.402 [0.795 - 2.475]	1.109 [0.67 - 1.834]	1.117 [0.71 - 1.757]	1.288 [0.826 - 2.006]	0.833 [0.468 - 1.482]	1.111 [0.364 - 3.393]	1.713 [0.927 - 3.166]	1.193 [0.816 - 1.745]	2.889 [1.076 - 7.761]	1.402 [0.795 - 2.475]
Umzinyathi	1.245 [1 - 1.549]	1.362 [0.769 - 2.414]	1.462 [1.054 - 2.03]	1.216 [0.921 - 1.606]	1.255 [0.965 - 1.633]	1.241 [0.967 - 1.594]	1.04 [0.709 - 1.527]	1.117 [0.632 - 1.973]	1.058 [0.758 - 1.476]	1.245 [1 - 1.549]	1.362 [0.769 - 2.414]	1.462 [1.054 - 2.03]
Uthukela	1.068 [0.874 - 1.306]	1.48 [0.905 - 2.42]	0.947 [0.711 - 1.261]	0.998 [0.776 - 1.282]	1.027 [0.812 - 1.3]	1.113 [0.881 - 1.405]	1.055 [0.792 - 1.406]	1.081 [0.668 - 1.751]	0.992 [0.732 - 1.344]	1.068 [0.874 - 1.306]	1.48 [0.905 - 2.42]	0.947 [0.711 - 1.261]
Uthungulu	1.025 [0.834 - 1.26]	0.947 [0.563 - 1.592]	1.083 [0.827 - 1.416]	1.12 [0.874 - 1.435]	0.98 [0.766 - 1.255]	1.081 [0.858 - 1.361]	1.128 [0.81 - 1.571]	0.907 [0.544 - 1.513]	1.095 [0.785 - 1.526]	1.025 [0.834 - 1.26]	0.947 [0.563 - 1.592]	1.083 [0.827 - 1.416]
Vhembe	1.004 [0.732 - 1.378]	0.549 [0.245 - 1.228]	1.193 [0.778 - 1.829]	1.006 [0.703 - 1.442]	0.927 [0.635 - 1.354]	1.079 [0.76 - 1.532]	0.923 [0.509 - 1.673]	0.611 [0.322 - 1.16]	0.942 [0.553 - 1.604]	1.004 [0.732 - 1.378]	0.549 [0.245 - 1.228]	1.193 [0.778 - 1.829]
Waterberg	1.167 [0.844 - 1.614]	1.456 [0.576 - 3.685]	1.166 [0.732 - 1.859]	0.993 [0.658 - 1.5]	1.368 [0.93 - 2.013]	0.996 [0.685 - 1.448]	0.81 [0.473 - 1.387]	1.01 [0.453 - 2.251]	0.93 [0.575 - 1.505]	1.167 [0.844 - 1.614]	1.456 [0.576 - 3.685]	1.166 [0.732 - 1.859]
West Coast	0.93 [0.745 - 1.16]	2.157 [0.972 - 4.788]	0.983 [0.712 - 1.357]	0.769 [0.592 - 0.999]	0.848 [0.653 - 1.103]	1.05 [0.8 - 1.379]	0.978 [0.625 - 1.531]	2.042 [0.892 - 4.674]	0.759 [0.55 - 1.047]	0.93 [0.745 - 1.16]	2.157 [0.972 - 4.788]	0.983 [0.712 - 1.357]
West Rand	0.989 [0.852 - 1.149]	0.862 [0.599 - 1.242]	1.049 [0.861 - 1.277]	0.937 [0.768 - 1.143]	0.926 [0.786 - 1.09]	1.065 [0.895 - 1.266]	0.809 [0.628 - 1.042]	0.946 [0.629 - 1.423]	0.937 [0.753 - 1.165]	0.989 [0.852 - 1.149]	0.862 [0.599 - 1.242]	1.049 [0.861 - 1.277]
Xhariep	1.312 [0.972 - 1.769]	1.231 [0.457 - 3.315]	1.35 [0.891 - 2.046]	1.36 [0.897 - 2.062]	1.294 [0.906 - 1.848]	1.319 [0.916 - 1.9]	0.732 [0.414 - 1.296]	0.95 [0.401 - 2.247]	1.615 [1.021 - 2.555]	1.312 [0.972 - 1.769]	1.231 [0.457 - 3.315]	1.35 [0.891 - 2.046]
Zululand	1.078 [0.78 - 1.489]	0.625 [0.285 - 1.369]	1.354 [0.873 - 2.099]	1.264 [0.835 - 1.913]	1.182 [0.8 - 1.747]	0.989 [0.687 - 1.426]	0.859 [0.515 - 1.432]	1.328 [0.594 - 2.97]	0.911 [0.545 - 1.522]	1.078 [0.78 - 1.489]	0.625 [0.285 - 1.369]	1.354 [0.873 - 2.099]