Supplementary Online Content

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eFigure 3. Number of deaths by cause, month, sex, and age group (0-64 years, 65+ years) in counties exposed to hurricanes in the United States for 1988 – 2018. The values in the plot represent the total counts of deaths in any county with at least one hurricane exposure (n=5,749,787). Pneumonia-type deaths are classified as respiratory diseases.

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eFigure 7. Percentage change in death rates per one day increase in monthly tropical cyclone exposure by cause of death, age group (0-24 years, 25-44 years, 45-64 years, 65-84 years and 85+ years), and lag time. Lag time was measured in months after tropical cyclone. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and age group-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for tropical cyclone-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.

eFigure 8. Percentage change in death rates per one day increase in monthly hurricane exposure by cause of death, age group (0-24 years, 25-44 years, 45-64 years, 65-84 years and 85+ years), and lag time. Lag time was measured in months after hurricane. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and age group-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for hurricane-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.

eFigure 9. Percentage change in death rates per one day increase in monthly tropical cyclone exposure by cause of death, sex, and lag time. Lag time was measured in months after tropical cyclone. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and sex-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for tropical cyclone-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.

eFigure 10. Percentage change in death rates per one day increase in monthly hurricane exposure by cause of death, sex, and lag time. Lag time was measured in months after hurricane. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and sex-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for hurricane-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.

eFigure 11. Percentage change in death rates per one day increase in monthly hurricane exposure by cause of death, social vulnerability tertiles, and lag time. The first tertile (blue) represents lowest social vulnerability and the third tertile (red) represents highest social vulnerability. Lag time was measured in months after hurricane. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and social vulnerability tertile-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for hurricane-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.

eFigure 12. Comparison of lag-specific coefficients by class of tropical cyclone when including or not including temperature term ($\nu_{temperature_{ct}}$). The values from the main model are on the x-axis with values from alternative model without temperature on the y-axis. Dots show the point estimates and whiskers represent 95% credible intervals. Pneumonia-type deaths were classified as respiratory diseases.

eFigure 13. Comparison of lag-specific coefficients by class of tropical cyclone when including or not including limit on matching control periods. The values from the main model are on the x-axis with values from alternative model with constraint of matched control periods being in same 5-year on the y-axis. Dots show the point estimates and whiskers represent 95% credible intervals. Pneumonia-type deaths were classified as respiratory diseases.

eAppendix. Supplemental methods

eMethods 1. Details on tropical cyclone data, mortality data, covariate data, and statistical analysis

Data sources

Exposure

We obtained data on tropical cyclone wind exposure in the United States, with full space and time coverage over our study period, and described in detail elsewhere.[1–8] In brief, we used daily estimates of maximum wind sustained speed by county to generate classifications of these exposures. As in previous work,[8] we defined hurricane exposure when the peak sustained wind that day in the population center of the county associated with the tropical cyclone at the point of closest approach reached or exceeded 64 knots (119 km/h, 74 mph; hurricane-force wind on the Beaufort scale[9]). We similarly defined tropical cyclone exposure as all days which reached or exceeded 34 knots (63 km/h, 39 mph; gale-force wind on the Beaufort scale[9]). A full list of included tropical cyclones is found in Table 1 in the main paper, with a map of tropical cyclone exposure counts in Figure 1 in the main paper. A plot of best-track routes of each tropical cyclone by year is found in eFigure 1.

The mean time difference between consecutive tropical cyclones in all counties was 45 months. No county which experienced a tropical cyclone in November of a particular year also experienced a cyclone in May of the subsequent year. Given our modelling structure (as described below), tropical cyclones from the following cyclone season could not have impacted results from the examined year, since May is six calendar months after November. Tropical cyclone days in all counties were discrete and non-consecutive. Therefore, each tropical cyclone exposure episode was of length one day throughout our study period. In county-months with more than one tropical cyclone exposure (123; 2.5% of 4,842 county-months) the mean number of days between exposures was 15 days. The greatest number of tropical cyclone days in a single county-month was 3, and occurred only in one county-month (Brunswick County, North Carolina in August 2004).

Outcomes

We used data on deaths from six studied causes (cancers, cardiovascular diseases, infectious and parasitic diseases, injuries, neuropsychiatric conditions, and respiratory diseases) by sex, age, underlying cause of death, and county of residence in counties that experienced at least one tropical cyclone exposure from 1988 to 2018 through the National Center for Health Statistics (NCHS) (n=33,619,393; 86.7% of total deaths in tropical cyclone-exposed counties) (https://www.cdc.gov/nchs/nvss/dvs_data_release.htm) and on population from the NCHS Vintage 2020 bridged-race dataset (though no analysis by race was carried out) for 1990 to 2018 (https://www.cdc.gov/nchs/nvss/bridged_race.htm) and from the US Census Bureau prior to 1990 (https://www.census.gov/data/tables/time-series/demo/popest/1980s-county.html) (eFigure 2). Race bridging, though not utilized in this analysis, refers to making data collected using one set of race categories consistent with data collected using a different set of race categories, to permit estimation. We also used a subset of these data which fell into counties that experienced at least one hurricane exposure in our study period (n=5,749,787) (eFigure 3). The underlying cause of death was coded according to the *International Classification of Diseases* (ICD) system (9th revision from 1988 to 1998 and 10th revision thereafter) and WHO Global Health Estimate cause categories (eTable 1).[10] We calculated monthly population counts through linear interpolation, assigning each yearly count to June. A summary of these data is found in eTables 2-3.

Covariate data

We obtained data on temperature from the Parameter-elevation Regressions on Independent Slopes Model (PRISM), which gathers climate observations from a wide range of monitoring networks and applies sophisticated quality control measures to generate a nationwide temperature dataset, with full space and time coverage over our study period.[11] We used gridded daily estimates at a resolution of 4 km to generate area-weighted monthly average temperatures by county. A summary of these data is found in eTables 2-3.

We used data on social vulnerability from the Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for 2018 (https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/SVI_documentation_2018.html). The SVI incorporates data from the US Census on socioeconomic status; household composition and disability; minority status and language; and housing type and transportation to determine the relative social vulnerability of every US county.[12] A county's SVI value indicates the relative vulnerability of every United States county compared with every other United States county, ranking from 0% (lowest vulnerability county in country) to 100% (highest vulnerability county in country). We divided the 1,206 counties included in our main analysis into SVI tertiles (low vulnerability to high vulnerability, 1 to 3; eFigure 4). Each tertile contained 402 counties. We used the same SVI tertile values for each county throughout analyses involving SVI stratification. When comparing the first year of available SVI data (2000) (https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/SVI_documentation_2000.html) to the SVI data we used from 2018, we found a correlation of 0.91 (eFigure 5). A summary of population, cause-specific death rates, and temperature is found by SVI in eTables 2-3.

Statistical analysis

Via a log-link function, we modelled death counts, for each cause of death separately, as follows:

$$log(E[deaths_{ct}]) = \alpha_0 + \alpha_c + \sum_{l=0}^{6} \beta_l Exposure_{lct} + ns(time) + \nu_{temperature_{ct}} + log(Population_{ct}),$$

where $deaths_{ct}$ denotes the number of cause-specific deaths in county c and time t; α_0 the common intercept; α_c the stratum-specific intercepts (not estimated in the conditional Poisson model); β_l lag-specific coefficients (log rate ratios) for tropical cyclone exposure counts ($Exposure_{lct}$), with lags l between the month of tropical cyclone exposure and month of death (lags 0 to 6); $ns(time)$ a natural spline with knots every three months during the study period to capture long-term time trends, as well as season-to-season variation in death rates;[13] $\nu_{temperature_{ct}}$ a second-order random walk to flexibly model the temperature – mortality relationship for temperature values ($temperature_{ct}$), widely used to characterize smoothly varying associations and equivalent to a spline with equally-spaced knots;[14] and $log(Population_{ct})$ the offset with $Population_{ct}$ the population in each county c at time t.

We used weakly informative priors so that parameter estimation was driven by the data. As in previous analyses,[15,16] hyper-priors were defined on the logarithm of the precision of the second-order random walk (i.e., the precision of $\nu_{temperature_{ct}}$) as well as the stratum-specific

intercepts (i.e., the precision of α_c), in other words on $log\ (1/\sigma^2)$. This was modeled as $logGamma(\theta, \delta)$ distributions with shape θ = 1 and rate δ = 0.001. For the other terms in the model, we used $N(0{,}1000)$.

We investigated the association of all tropical cyclone exposures together (≥34 knots), and used stratified modeling to separately estimate effects of exposure to hurricane-force (≥64 knots; including 153 counties with at least one exposure) intensities for each cause of death (Figure 2 in main paper). We assessed whether estimated effects varied by age group ((i) 0-64 years or 65+ years for main analysis or (ii) 0-24 years, 25-44 years, 45-64 years, 65-84 years and 85+ years for a supplementary analysis) (Figure 3 in main paper and eFigures 6-8) and by sex (female or male) (eFigures 9-10) by conducting stratified analyses, using the same model as described above and the corresponding age group- or sex-specific population offset. We also assessed whether estimated effects varied by social vulnerability by fitting stratified analyses by SVI tertile (low vulnerability to high vulnerability, 1 to 3), using the same model as described above with county-specific population offsets (Figure 4 in main paper and eFigure 11). Values from Figures 2-4 in the main paper are found in eTables 4-6.

The reported 95% credible intervals (CrI) are the 2.5th to 97.5th percentiles of each estimated parameter's posterior marginal distribution. Any reported positive association was based on a positive point estimate with a two-sided 95% credible intervals which excluded the null, with a negative association the same but with a negative point estimate. To formally and quantitatively calculate the probability that one effect estimate was greater than another, we obtained 1,000 draws from the posterior marginal distribution of each effect estimate.[17] The proportion of draws that was higher than the other set of draws represented the probability that one effect estimate was higher than the one compared to. Full results for this formal comparison of model parameters are found in eTables 7-12.

eMethods 2. Statistical methods for the sensitivity analyses

Sensitivity analyses
First, we assessed the sensitivity of our results to temperature adjustment; we fit models without the described temperature term and compared results to the main model (eFigure 12). Second, we performed a stricter matching analysis, limiting matched county-months for comparison in the same 5-year period (1988-1992, 1993-1997, …, 2008-2012, with 2013-2018 as 6-year period to include all data) (eFigure 13). For temperature sensitivity analyses (eFigure 12), there was correlation of R=0.99 and a slope of 1.00 [95%CrI,0.98–1.01] between estimates of associations with (main) and without (sensitivity) temperature in the model. For sensitivity analyses limiting county-month matching to control periods in nearby years (eFigure 13), there was a correlation of R=0.95 and a slope of 0.95 [95%CrI,0.88–1.05] between estimates of associations without (main) and with (sensitivity) the 5-year matching control period restriction. The same conclusions would be drawn from the main and sensitivity analyses.

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eTable 1. Causes of death used in the analysis with ICD-9 and ICD-10 codes.

Cause of death	ICD-9	ICD-10
Cancers	140-239	C00-C99, D00-D49
Cardiovascular diseases	390-459	I00-I99
Infectious and parasitic diseases	0-139, 279.5-279.6, 320-323, 771.3	A00-A99, B00-B99, G00-G05, G14, N70-N74
Injuries	E800-E999	V00-Y99, W00-W99, X00-X40, X43-44, X46-X99, Y00-Y89
Neuropsychiatric conditions	290-319, 324-359	F00-F99, G06-G13, G15-98, X41-X42, X45
Respiratory diseases	381-382, 460-519	H62-H67, J00-J99

eTable 2. Summary statistics by percentile of the tropical cyclone-exposed county units used in the analysis at beginning (1988) and end (2018) of study period.

Tropical cyclone-exposed counties															
		1988							2018						
Percentile		1st	5th	25th	50th	75th	95th	99th	1st	5th	25th	50th	75th	95th	99th
Population	Overall	3,938	7,193	15,917	32,971	83,762	430,536	1,206,948	3,933	7,590	17,758	38,261	107,850	557,606	1,454,199
	Female	2,063	3,667	8,187	16,806	43,104	223,785	629,909	1,924	3,652	8,864	19,375	54,893	287,111	752,309
	Male	1,860	3,502	7,822	15,880	40,420	209,697	571,247	1,937	3,831	8,969	19,132	52,699	271,298	710,507
	0-64 years	3,253	6,116	13,617	28,642	72,832	382,766	1,061,246	3,279	5,999	14,073	30,944	87,785	463,077	1,230,795
	65+ years	504	1,000	2,253	4,343	10,029	59,557	170,601	767	1,514	3,513	7,058	18,862	95,459	238,848
	SVI 1	5,714	8,296	20,089	44,540	99,948	422,723	961,765	6,059	8,283	26,738	55,530	158,038	589,403	1,149,150
	SVI 2	4,076	8,052	16,267	36,330	115,349	620,730	1,205,773	3,945	8,610	17,677	40,074	141,598	754,613	1,482,558
	SVI 3	3,425	5,684	13,552	23,538	47,740	239,011	1,215,472	2,690	6,442	14,288	26,248	54,557	263,427	1,584,881
Cancer monthly death rate (age standardized, per 1,000,000)	Overall	75.1	99.1	122.5	136.6	150.7	180.4	210.1	53.7	71.5	88.0	100.4	114.1	138.0	168.2
	Female	40.0	61.0	87.7	103.3	115.8	142.1	167.8	34.0	55.0	72.1	82.4	96.7	127.1	155.7
	Male	75.0	111.9	149.4	168.9	192.7	238.1	290.9	49.9	76.6	100.3	116.2	133.8	174.8	208.6
	0-64 years	0.0	26.7	48.1	61.0	75.7	110.1	143.6	0.0	18.4	32.1	41.3	53.4	80.4	105.2
	65+ years	210.5	397.0	643.8	866.1	1,266.6	1,661.7	2,052.4	239.3	396.1	562.7	714.4	909.2	1,197.6	1,521.2
	SVI 1	76.3	98.5	120.6	132.3	145.2	163.1	195.5	48.5	67.8	83.1	92.4	101.7	122.4	136.1
	SVI 2	87.7	100.7	123.5	137.0	151.6	176.5	211.6	66.4	73.8	89.5	101.2	113.4	133.0	160.6
	SVI 3	72.5	96.2	124.9	140.9	157.4	185.5	211.6	49.6	76.6	97.6	109.6	122.9	152.5	190.3
Cardiovascular disease monthly death rate (age standardized, per 1,000,000)	Overall	158.1	183.9	224.2	249.5	278.5	338.5	379.4	70.3	86.5	107.9	129.6	156.5	197.2	237.9
	Female	95.8	129.4	164.1	188.3	214.9	268.1	319.3	46.7	60.4	80.7	98.9	120.7	165.2	197.1
	Male	169.8	217.3	277.2	311.1	349.3	433.6	506.4	84.1	101.9	132.2	157.1	192.5	248.9	302.2
	0-64 years	0.0	18.9	38.7	66.8	97.5	150.6	193.2	0.0	11.0	25.1	42.3	65.3	108.4	150.4
	65+ years	982.1	1,340.9	1,786.5	2,181.2	2,724.7	3,407.8	4,119.5	476.8	625.3	838.9	1,053.7	1,281.7	1,718.5	2,126.7

Tropical cyclone-exposed counties															
		1988							2018						
Percentile		1st	5th	25th	50th	75th	95th	99th	1st	5th	25th	50th	75th	95th	99th
	SVI 1	167.5	182.9	214.4	235.0	257.7	285.9	308.8	67.6	76.8	95.0	109.0	125.6	150.9	162.6
	SVI 2	158.2	182.6	225.0	249.9	274.2	324.3	373.1	75.7	90.3	111.4	130.4	152.2	185.7	224.4
	SVI 3	152.2	185.8	240.8	271.4	303.4	364.8	397.4	90.9	106.9	133.1	156.8	180.2	228.6	261.9
Infectious and parasitic disease monthly death rate (age standardized, per 1,000,000)	Overall	0.0	0.0	6.0	9.6	14.0	24.2	37.7	0.0	3.6	8.2	11.7	16.8	25.3	34.6
	Female	0.0	0.0	2.9	6.6	10.6	20.7	34.1	0.0	0.0	6.4	10.0	14.7	27.0	38.3
	Male	0.0	0.0	6.1	12.1	18.7	35.0	55.8	0.0	0.0	8.3	12.6	19.2	32.0	45.3
	0-64 years	0.0	0.0	0.0	3.1	8.6	22.3	44.1	0.0	0.0	0.0	4.9	9.1	20.5	33.0
	65+ years	0.0	0.0	0.0	52.9	90.0	182.7	307.5	0.0	0.0	46.5	75.1	110.6	196.6	302.8
	SVI 1	0.0	0.0	5.5	8.3	12.3	20.5	30.3	1.1	3.7	6.9	9.1	11.7	17.7	21.1
	SVI 2	0.0	0.0	6.1	9.5	13.7	23.1	39.5	0.0	3.3	8.5	11.7	16.2	23.7	33.5
	SVI 3	0.0	0.0	7.0	11.2	15.5	27.2	49.9	0.0	4.2	11.6	16.2	21.0	31.9	36.7
Injury monthly death rate (age standardized, per 1,000,000)	Overall	20.9	29.0	41.8	55.6	72.2	103.6	135.9	14.6	25.2	41.6	54.3	68.1	96.9	129.0
	Female	0.0	5.4	18.5	26.4	36.7	62.1	90.2	0.0	8.4	20.7	30.4	41.8	70.2	100.3
	Male	19.2	40.7	60.8	81.3	108.0	163.8	213.6	14.1	32.7	55.8	75.7	96.3	138.9	198.2
	0-64 years	0.0	5.9	22.0	43.8	75.9	136.3	190.7	0.0	7.7	24.4	43.7	72.5	116.6	171.1
	65+ years	0.0	0.0	48.4	90.7	157.2	302.8	463.0	0.0	0.0	58.6	96.6	148.8	255.8	392.6
	SVI 1	15.3	26.3	35.4	45.0	57.9	82.2	109.6	11.6	23.2	35.6	46.7	59.2	74.8	99.9
	SVI 2	21.7	30.9	41.9	53.6	69.9	99.3	134.4	15.7	27.4	44.2	55.4	68.6	98.9	127.1
	SVI 3	23.7	35.5	53.3	67.3	83.2	115.0	144.4	18.6	30.3	48.2	60.8	73.8	104.8	137.4
Neuropsychiatric condition monthly death rate (age standardized, per 1,000,000)	Overall	0.0	2.6	9.5	14.0	18.6	29.4	40.9	17.6	28.9	42.9	52.1	61.8	79.2	95.3
	Female	0.0	0.0	6.0	10.3	14.9	26.3	41.1	11.9	22.9	38.2	47.7	57.6	75.9	93.7
	Male	0.0	0.0	10.1	16.7	24.0	41.4	60.6	9.5	24.9	43.1	55.2	68.8	96.1	119.8
	0-64 years	0.0	0.0	0.0	3.9	9.0	22.0	40.1	0.0	0.0	7.8	15.4	25.8	48.1	73.9
	65+ years	0.0	0.0	49.3	96.3	150.2	272.4	384.9	76.8	199.1	340.7	423.8	514.6	687.7	909.6

Tropical cyclone-exposed counties															
		1988							2018						
Percentile		1st	5th	25th	50th	75th	95th	99th	1st	5th	25th	50th	75th	95th	99th
	SVI 1	0.0	4.1	9.6	13.6	17.7	27.1	37.2	21.9	30.1	43.1	52.2	60.8	75.4	87.9
	SVI 2	0.0	3.0	10.4	13.9	18.5	27.6	40.8	17.6	28.2	42.4	51.1	61.5	79.3	91.4
	SVI 3	0.0	0.0	8.5	14.8	20.2	33.6	40.5	11.3	29.6	43.3	53.1	63.1	82.7	98.8
Respiratory disease monthly death rate (age standardized, per 1,000,000)	Overall	15.9	25.6	39.0	46.5	55.5	76.9	99.1	16.1	23.7	35.3	44.9	56.5	79.3	105.2
	Female	0.0	10.3	22.6	30.3	37.2	53.0	75.1	8.3	18.1	29.8	38.9	50.8	78.0	99.1
	Male	15.9	29.5	49.7	62.0	76.9	115.9	147.2	15.4	23.3	37.5	49.3	64.3	93.8	124.5
	0-64 years	0.0	0.0	4.2	9.9	16.1	33.4	51.5	0.0	0.0	6.4	11.4	18.2	36.8	55.7
	65+ years	0.0	117.5	258.5	392.9	608.4	954.5	1,316.2	94.8	174.8	296.6	390.0	515.6	766.8	1,019.1
	SVI 1	19.1	27.9	37.7	43.9	52.3	67.9	82.1	16.9	21.9	30.7	38.1	46.9	60.8	72.4
	SVI 2	14.6	25.9	40.0	47.8	56.6	80.3	99.2	15.2	24.2	37.9	47.9	60.5	79.5	98.1
	SVI 3	17.0	24.1	38.3	48.9	58.2	84.3	108.8	19.8	26.6	39.9	50.1	63.1	90.2	110.7
Temperature (annual mean, °C)	Overall	-6.2	-2.6	7.1	14.9	22.3	27.1	28.5	-3.5	0.5	9.6	16.9	22.1	27.3	28.6
	SVI 1	-7.7	-4.6	4.1	11.4	20.3	26	27.6	-4.8	-1.7	5.2	14.5	20.4	25.5	27.9
	SVI 2	-6.1	-2.5	6.9	14.7	22.1	27	28.4	-3.5	0.6	9	16.7	21.8	27.2	28.6
	SVI 3	-1.5	2.8	10.1	17.3	24.5	27.5	29.5	1.9	6	13.4	19.6	24.3	27.8	29.5

eTable 3. Summary statistics by percentile of the hurricane-exposed county units used in the analysis at beginning (1988) and end (2018) of study period.

Hurricane-exposed counties															
		1988							2018						
Percentile		1st	5th	25th	50th	75th	95th	99th	1st	5th	25th	50th	75th	95th	99th
Population	Overall	3,562	6,302	19,539	41,895	98,590	433,959	1,525,178	2,999	6,883	22,156	53,629	164,230	615,909	2,313,651
	Female	1,936	3,290	9,847	20,992	50,505	227,505	796,527	1,553	3,363	11,385	27,282	84,807	317,484	1,187,785
	Male	1,626	3,026	9,503	20,163	47,819	206,455	728,651	1,446	3,459	10,993	26,932	79,423	299,382	1,125,867
	0-64 years	3,026	5,283	17,369	36,470	89,795	366,481	1,267,562	2,264	5,398	17,584	45,034	133,275	523,331	1,933,978
	65+ years	530	949	2,391	5,223	12,196	76,163	222,848	738	1,238	3,916	9,355	30,736	138,638	395,912
	SVI 1	10,136	12,624	49,408	87,584	151,545	282,356	387,643	9,725	21,150	63,361	160,661	225,318	553,547	598,653
	SVI 2	2,100	8,300	22,268	54,202	174,984	718,428	1,969,578	1,754	9,760	23,726	74,362	318,098	1,433,245	3,312,486
	SVI 3	3,785	5,392	14,834	26,289	59,028	189,358	773,743	3,798	6,132	15,970	32,494	64,926	285,512	1,227,775
Cancer monthly death rate (age standardized, per 1,000,000)	Overall	66.2	98.4	125.1	137.8	150.3	181.4	194.9	61.3	73.2	86.7	96.8	112.8	130.3	141.6
	Female	23.9	63.5	86.7	101.4	113.1	133.5	165.0	44.1	55.2	69.9	82.2	96.3	120.2	147.1
	Male	66.3	122.2	154.0	172.2	198.1	244.3	271.8	41.2	73.6	100.1	113.4	130.7	164.1	181.6
	0-64 years	0.0	27.5	50.1	62.8	78.6	106.6	123.3	0.0	18.7	32.9	41.7	52.9	73.1	88.5
	65+ years	209.1	397.2	621.1	853.8	1,286.2	1,775.2	2,029.1	233.8	386.7	532.1	700.3	879.9	1,186.9	1,500.6
	SVI 1	111.1	112.9	125.7	134.9	153.2	173.8	180.1	59.3	72.0	84.1	87.5	94.4	102.8	121.6
	SVI 2	48.1	100.7	126.7	140.0	150.9	173.7	176.1	61.2	72.8	86.1	93.0	108.7	119.3	129.9
	SVI 3	69.2	91.6	123.7	137.6	149.3	188.4	204.2	70.2	76.7	91.5	105.7	117.6	138.4	143.9
Cardiovascular disease monthly death rate (age standardized, per 1,000,000)	Overall	155.3	174.6	211.8	244.0	281.7	341.3	380.4	69.8	84.6	107.9	130.4	156.7	189.9	233.3
	Female	103.8	125.3	161.3	188.5	219.3	274.5	326.2	43.9	57.8	83.5	99.6	120.8	158.9	200.2
	Male	168.3	208.6	259.8	293.5	351.3	437.6	554.0	87.1	100.5	132.2	156.8	189.2	251.0	278.2
	0-64 years	0.0	20.5	40.6	68.4	98.2	152.6	185.4	0.0	12.7	27.3	44.8	67.2	109.3	153.5
	65+ years	1,157.7	1,305.3	1,732.6	2,020.7	2,666.9	3,342.8	4,514.8	450.9	619.1	815.8	1,007.7	1,236.8	1,713.8	2,064.6

Hurricane-exposed counties															
		1988							2018						
Percentile		1st	5th	25th	50th	75th	95th	99th	1st	5th	25th	50th	75th	95th	99th
	SVI 1	168.1	171.3	199.1	220.7	235.6	274.7	300.9	69.2	72.8	87.8	107.9	123.4	134.7	138.6
	SVI 2	165.2	175.1	211.6	243.6	273.7	347.3	445.6	72.0	83.7	105.3	122.6	140.0	180.8	188.9
	SVI 3	150.1	189.7	223.1	252.4	299.7	356.9	377.0	92.8	98.8	125.5	149.5	172.4	210.3	237.8
Infectious and parasitic disease monthly death rate (age standardized, per 1,000,000)	Overall	0.0	0.0	8.1	12.0	16.4	24.7	37.2	0.0	4.4	8.7	13.3	18.2	26.7	32.4
	Female	0.0	0.0	4.0	8.1	11.6	19.4	41.1	0.0	0.0	7.2	11.0	15.9	28.2	39.3
	Male	0.0	0.0	8.5	15.6	21.5	36.4	53.1	0.0	0.0	9.0	13.9	19.8	32.4	42.8
	0-64 years	0.0	0.0	0.0	5.1	11.5	28.3	49.3	0.0	0.0	3.4	6.2	10.6	20.4	27.9
	65+ years	0.0	0.0	14.1	52.2	87.1	165.9	257.6	0.0	0.0	47.8	73.4	110.9	196.0	289.5
	SVI 1	0.0	0.0	6.0	9.6	12.7	17.1	20.5	5.1	5.7	8.3	10.1	13.8	15.9	16.7
	SVI 2	0.0	2.5	9.0	13.0	16.5	25.2	33.9	0.0	2.7	8.4	11.6	15.2	21.0	23.0
	SVI 3	0.0	0.0	8.3	12.0	17.0	25.7	36.6	0.8	4.7	11.8	17.1	22.1	28.2	34.6
Injury monthly death rate (age standardized, per 1,000,000)	Overall	15.8	29.1	49.4	63.9	80.2	106.8	146.8	18.3	32.8	45.1	54.5	63.4	84.2	111.6
	Female	0.0	2.9	22.2	29.6	41.9	69.0	111.6	0.0	7.1	21.2	29.5	39.8	63.3	106.7
	Male	4.8	42.6	73.1	92.1	124.3	157.2	226.8	13.0	41.2	64.1	76.1	94.2	124.7	171.8
	0-64 years	0.0	0.0	25.7	49.7	89.0	140.9	196.8	0.0	6.1	25.7	43.6	72.9	109.2	138.3
	65+ years	0.0	0.0	43.7	87.6	152.4	275.2	532.1	0.0	0.0	60.8	93.0	140.0	232.8	312.0
	SVI 1	14.7	20.4	36.9	53.6	63.3	75.5	83.1	25.6	33.3	37.8	49.3	54.6	63.2	70.1
	SVI 2	10.7	37.1	51.3	58.9	76.4	89.1	103.9	14.3	33.0	43.4	53.2	62.0	78.1	84.3
	SVI 3	23.7	35.1	55.6	70.0	84.5	120.5	160.3	19.1	32.4	48.0	57.4	68.5	99.2	118.4
Neuropsychiatric condition monthly death rate (age standardized, per 1,000,000)	Overall	0.0	2.3	9.7	13.8	18.1	26.6	45.5	21.1	28.7	41.3	50.5	58.9	72.4	80.4
	Female	0.0	0.0	5.4	9.8	14.8	24.8	44.2	15.9	26.0	36.5	45.7	53.1	73.3	86.9
	Male	0.0	0.0	11.2	16.5	23.7	38.9	64.1	10.0	21.3	43.6	53.3	64.9	83.6	103.6
	0-64 years	0.0	0.0	0.0	4.1	9.5	20.2	37.8	0.0	0.0	8.6	15.3	24.1	45.5	67.7
	65+ years	0.0	0.0	40.6	91.2	145.2	253.6	376.7	83.3	198.9	322.8	412.0	492.1	651.1	809.4

Hurricane-exposed counties															
		1988							2018						
Percentile		1st	5th	25th	50th	75th	95th	99th	1st	5th	25th	50th	75th	95th	99th
	SVI 1	4.6	6.0	11.8	14.0	17.0	21.7	22.8	25.8	32.5	46.7	54.1	58.7	65.8	74.8
	SVI 2	0.0	2.0	10.9	13.1	16.7	26.6	40.1	14.1	28.6	39.6	48.3	57.4	67.4	75.0
	SVI 3	0.0	1.2	8.8	14.3	19.0	29.3	42.5	22.0	29.2	42.0	50.4	60.6	77.3	82.7
Respiratory disease monthly death rate (age standardized, per 1,000,000)	Overall	17.8	24.9	36.2	43.4	52.6	66.7	81.8	11.6	20.9	31.5	43.2	53.2	78.7	105.1
	Female	0.0	10.3	22.5	28.5	35.8	48.8	61.9	0.0	14.1	25.8	37.0	48.2	73.7	98.8
	Male	17.6	31.2	46.2	57.1	70.5	104.0	119.9	13.6	21.0	35.0	45.9	60.6	85.6	140.9
	0-64 years	0.0	0.0	5.8	9.8	16.2	34.1	49.8	0.0	0.0	6.4	11.3	17.8	35.4	51.6
	65+ years	0.0	96.1	249.0	357.6	551.9	874.9	1,071.1	0.0	141.2	256.7	353.5	485.0	690.9	899.9
	SVI 1	25.6	29.2	33.4	36.8	45.3	58.0	59.1	18.4	19.9	28.0	32.9	42.0	55.6	61.8
	SVI 2	9.1	27.8	39.5	46.2	54.5	70.2	95.4	7.1	18.1	31.1	43.6	55.9	73.9	129.1
	SVI 3	18.3	24.0	36.7	43.9	52.0	66.6	81.3	12.3	23.9	35.7	45.3	59.3	83.4	97.4
Temperature (annual mean, °C)	Overall	0.6	6.4	13.1	19.4	25.6	27.7	29.3	1.7	9.5	15.6	21	25.5	28.2	29.2
	SVI 1	-3	0.7	10.4	17.6	23.5	27.5	28.3	0.4	1.9	13.5	19.6	24.4	27.9	28.5
	SVI 2	3.1	7	14.1	19.8	25.7	27.8	29	7.3	10.8	16.3	21.3	25.7	28.4	29.1
	SVI 3	3.5	6.9	13.8	19.7	25.7	27.7	29.6	7.4	10.5	15.9	21.4	25.7	28.2	29.4

eTable 4. Percentage change in death rates per one day increase in monthly tropical cyclone or hurricane-only exposure by cause of death, and lag time. Lag time was measured in months after tropical cyclone or hurricane. This Table accompanies Figure 2 from the main manuscript. Pneumonia-type deaths were classified as respiratory diseases.

Wind exposure	Cause	Lag (months)	Percentage change	95% Credible Interval (CrI)	
Hurricanes	Cancers	0	-0.1%	-2.4%	2.3%
		1	-0.5%	-2.8%	1.9%
		2	-2.2%	-4.5%	0.1%
		3	-0.4%	-2.7%	2.0%
		4	1.1%	-1.2%	3.5%
		5	0.9%	-1.4%	3.2%
		6	0.8%	-1.5%	3.2%
	Cardiovascular diseases	0	4.4%	2.3%	6.5%
		1	4.2%	2.2%	6.3%
		2	0.8%	-1.2%	2.8%
		3	0.4%	-1.6%	2.4%
		4	-0.8%	-2.7%	1.2%
		5	0.5%	-1.4%	2.4%
		6	1.1%	-0.9%	3.0%
	Infectious and parasitic diseases	0	4.3%	-2.2%	11.3%
		1	7.7%	1.1%	14.8%
		2	11.4%	4.7%	18.4%
		3	1.0%	-5.2%	7.7%
		4	4.1%	-2.1%	10.8%
		5	-2.0%	-8.0%	4.4%
		6	2.2%	-4.0%	8.8%
	Injuries	0	33.4%	28.3%	38.8%
		1	8.0%	3.3%	12.9%
		2	-3.4%	-7.7%	1.2%
		3	5.2%	0.5%	10.1%
		4	3.5%	-1.2%	8.4%
		5	-0.5%	-5.0%	4.2%
		6	0.3%	-4.2%	5.0%
	Neuropsychiatric conditions	0	9.9%	5.6%	14.3%
		1	9.3%	5.1%	13.7%
		2	6.2%	2.1%	10.4%
		3	2.5%	-1.5%	6.7%
		4	0.2%	-3.7%	4.2%
		5	-0.3%	-4.1%	3.6%
		6	0.3%	-3.6%	4.3%
	Respiratory diseases	0	6.3%	2.0%	10.8%

Wind exposure	Cause	Lag (months)	Percentage change	95% Credible Interval (CrI)	
Hurricanes		1	8.3%	4.0%	12.7%
		2	3.0%	-1.1%	7.2%
		3	-1.5%	-5.3%	2.5%
		4	0.0%	-3.7%	3.9%
		5	0.3%	-3.3%	4.0%
		6	-4.2%	-7.8%	-0.5%
Tropical cyclones	Cancers	0	0.1%	-0.5%	0.7%
		1	-0.3%	-0.9%	0.3%
		2	0.0%	-0.6%	0.6%
		3	0.4%	-0.2%	1.0%
		4	0.1%	-0.5%	0.7%
		5	-0.3%	-0.9%	0.3%
		6	-0.2%	-0.8%	0.4%
	Cardiovascular diseases	0	0.8%	0.3%	1.3%
		1	1.2%	0.6%	1.7%
		2	0.7%	0.2%	1.2%
		3	1.1%	0.6%	1.6%
		4	0.0%	-0.5%	0.5%
		5	0.8%	0.3%	1.3%
		6	-0.4%	-0.9%	0.1%
	Infectious and parasitic diseases	0	0.5%	-1.2%	2.3%
		1	1.8%	0.1%	3.6%
		2	0.5%	-1.2%	2.2%
		3	0.0%	-1.6%	1.7%
		4	-1.7%	-3.3%	0.0%
		5	0.6%	-1.0%	2.3%
		6	-1.9%	-3.5%	-0.2%
	Injuries	0	3.4%	2.2%	4.6%
		1	3.7%	2.5%	4.9%
		2	-0.6%	-1.8%	0.6%
		3	1.5%	0.3%	2.7%
		4	1.5%	0.3%	2.8%
		5	0.4%	-0.8%	1.7%
		6	0.9%	-0.4%	2.1%
	Neuropsychiatric conditions	0	0.6%	-0.5%	1.7%
		1	1.2%	0.1%	2.4%
		2	0.4%	-0.6%	1.5%
		3	1.2%	0.1%	2.2%
		4	0.0%	-1.0%	1.1%
		5	0.1%	-0.9%	1.2%

Wind exposure	Cause	Lag (months)	Percentage change	95% Credible Interval (CrI)	
Tropical cyclones		6	-0.6%	-1.7%	0.4%
	Respiratory diseases	0	0.0%	-1.1%	1.1%
		1	1.3%	0.2%	2.4%
		2	-0.2%	-1.2%	0.9%
		3	1.3%	0.4%	2.4%
		4	-0.8%	-1.8%	0.1%
		5	0.4%	-0.5%	1.3%
		6	-1.8%	-2.7%	-0.8%

eTable 5. Percentage change in death rates per one day increase in monthly tropical cyclone exposure by cause of death, age group (0-64 years, 65+ years), and lag time. Lag time was measured in months after tropical cyclone. This Table accompanies Figure 3 from the main manuscript. Pneumonia-type deaths were classified as respiratory diseases.

Age group	Cause	Lag (months)	Percentage change	95% Credible Interval (CrI)	
0-64 years	Cancers	0	0.8%	-0.3%	1.8%
		1	-0.9%	-2.0%	0.1%
		2	0.7%	-0.4%	1.8%
		3	-0.6%	-1.7%	0.5%
		4	-0.1%	-1.2%	1.0%
		5	-0.8%	-1.8%	0.3%
		6	-0.4%	-1.5%	0.7%
	Cardiovascular diseases	0	0.8%	-0.4%	2.0%
		1	1.0%	-0.2%	2.2%
		2	0.9%	-0.2%	2.1%
		3	0.6%	-0.5%	1.8%
		4	0.6%	-0.5%	1.8%
		5	0.9%	-0.2%	2.1%
		6	0.6%	-0.5%	1.7%
	Infectious and parasitic diseases	0	1.0%	-1.4%	3.4%
		1	2.9%	0.5%	5.3%
		2	2.0%	-0.4%	4.4%
		3	2.3%	-0.1%	4.7%
		4	0.6%	-1.7%	2.9%
		5	1.9%	-0.4%	4.3%
		6	-1.4%	-3.7%	0.9%
	Injuries	0	2.5%	1.1%	3.9%
		1	2.7%	1.3%	4.2%
		2	-0.7%	-2.1%	0.7%
		3	1.0%	-0.4%	2.5%
		4	2.2%	0.7%	3.7%
		5	0.7%	-0.7%	2.2%
		6	1.1%	-0.4%	2.5%
	Neuropsychiatric conditions	0	-0.7%	-3.2%	1.8%
		1	1.9%	-0.6%	4.5%
		2	1.5%	-0.9%	4.1%
		3	1.4%	-1.1%	3.9%
		4	0.0%	-2.5%	2.5%
		5	0.7%	-1.7%	3.2%
		6	-1.7%	-4.1%	0.8%
	Respiratory diseases	0	-2.0%	-4.7%	0.6%

Age group	Cause	Lag (months)	Percentage change	95% Credible Interval (CrI)	
		1	0.7%	-1.9%	3.4%
		2	0.9%	-1.6%	3.5%
		3	2.0%	-0.4%	4.5%
		4	-0.9%	-3.2%	1.5%
		5	1.0%	-1.3%	3.4%
		6	-1.1%	-3.4%	1.3%
65+ years	Cancers	0	-0.1%	-0.8%	0.6%
		1	0.0%	-0.7%	0.7%
		2	-0.2%	-0.9%	0.5%
		3	1.0%	0.3%	1.7%
		4	0.5%	-0.2%	1.2%
		5	0.3%	-0.4%	1.0%
		6	0.2%	-0.5%	0.9%
	Cardiovascular diseases	0	1.0%	0.4%	1.5%
		1	1.3%	0.8%	1.9%
		2	0.9%	0.3%	1.4%
		3	1.6%	1.0%	2.1%
		4	0.3%	-0.2%	0.9%
		5	1.2%	0.6%	1.7%
		6	-0.2%	-0.7%	0.3%
	Infectious and parasitic diseases	0	1.5%	-0.9%	3.9%
		1	2.0%	-0.3%	4.4%
		2	0.3%	-1.9%	2.6%
		3	-0.4%	-2.6%	1.9%
		4	-2.3%	-4.4%	-0.1%
		5	0.8%	-1.3%	3.1%
		6	-0.6%	-2.8%	1.6%
	Injuries	0	6.2%	3.9%	8.5%
		1	6.4%	4.2%	8.7%
		2	0.0%	-2.1%	2.2%
		3	3.0%	0.8%	5.2%
		4	0.3%	-1.9%	2.5%
		5	0.1%	-2.0%	2.3%
		6	0.4%	-1.7%	2.7%
	Neuropsychiatric conditions	0	0.9%	-0.3%	2.2%
		1	1.1%	-0.1%	2.3%
		2	0.2%	-1.0%	1.4%
		3	1.3%	0.2%	2.5%
		4	0.4%	-0.7%	1.6%
		5	0.4%	-0.7%	1.6%

Age group	Cause	Lag (months)	Percentage change	95% Credible Interval (CrI)	
		6	0.0%	-1.2%	1.1%
	Respiratory diseases	0	0.4%	-0.8%	1.6%
		1	1.5%	0.3%	2.6%
		2	-0.3%	-1.4%	0.8%
		3	1.5%	0.5%	2.6%
		4	-0.4%	-1.4%	0.6%
		5	0.7%	-0.2%	1.7%
		6	-1.5%	-2.5%	-0.5%

eTable 6. Percentage change in death rates per one day increase in monthly tropical cyclone exposure by cause of death, social vulnerability tertiles, and lag time. The first tertile (SVI 1) represents lowest social vulnerability and the third tertile (SVI 3) represents highest social vulnerability. Lag time was measured in months after tropical cyclone. This Table accompanies Figure 4 from the main manuscript. Pneumonia-type deaths were classified as respiratory diseases.

SVI	Cause	Lag (months)	Percentage change	95% Credible Interval (CrI)	
SVI 1	Cancers	0	0.2%	-0.9%	1.4%
		1	0.2%	-0.9%	1.4%
		2	0.8%	-0.3%	2.0%
		3	1.3%	0.1%	2.5%
		4	0.3%	-0.8%	1.5%
		5	0.7%	-0.4%	1.9%
		6	-0.4%	-1.6%	0.7%
	Cardiovascular diseases	0	1.4%	0.3%	2.5%
		1	1.2%	0.1%	2.2%
		2	0.6%	-0.4%	1.7%
		3	1.7%	0.7%	2.7%
		4	0.5%	-0.5%	1.5%
		5	1.4%	0.4%	2.4%
		6	-0.3%	-1.2%	0.7%
	Infectious and parasitic diseases	0	0.8%	-2.8%	4.4%
		1	1.5%	-2.0%	5.2%
		2	-1.0%	-4.4%	2.6%
		3	-2.0%	-5.4%	1.4%
		4	-2.0%	-5.3%	1.4%
		5	-3.9%	-7.1%	-0.6%
		6	-1.0%	-4.3%	2.4%
	Injuries	0	0.7%	-1.7%	3.1%
		1	2.6%	0.1%	5.0%
		2	0.9%	-1.5%	3.4%
		3	3.0%	0.5%	5.5%
		4	3.3%	0.8%	5.9%
		5	0.3%	-2.2%	2.8%
		6	1.0%	-1.5%	3.6%
	Neuropsychiatric conditions	0	-1.7%	-3.7%	0.4%
		1	1.1%	-0.9%	3.2%
		2	0.1%	-1.8%	2.1%
		3	1.5%	-0.5%	3.5%
		4	-0.8%	-2.7%	1.2%
		5	0.4%	-1.6%	2.3%

SVI	Cause	Lag (months)	Percentage change	95% Credible Interval (CrI)	
SVI 1		6	-1.4%	-3.3%	0.6%
	Respiratory diseases	0	-1.0%	-3.0%	1.1%
		1	0.6%	-1.4%	2.7%
		2	-1.6%	-3.6%	0.3%
		3	0.8%	-1.1%	2.7%
		4	-1.4%	-3.2%	0.4%
		5	0.5%	-1.3%	2.2%
		6	-1.1%	-2.9%	0.7%
SVI 2	Cancers	0	0.1%	-0.8%	1.0%
		1	-0.7%	-1.6%	0.2%
		2	-0.5%	-1.3%	0.4%
		3	-0.1%	-1.0%	0.8%
		4	0.4%	-0.5%	1.3%
		5	-1.0%	-1.9%	-0.1%
		6	-0.3%	-1.2%	0.6%
	Cardiovascular diseases	0	0.7%	0.0%	1.6%
		1	1.5%	0.7%	2.2%
		2	0.5%	-0.3%	1.3%
		3	0.8%	0.1%	1.6%
		4	-0.2%	-0.9%	0.5%
		5	0.5%	-0.2%	1.3%
		6	-0.6%	-1.3%	0.2%
	Infectious and parasitic diseases	0	0.7%	-1.9%	3.4%
		1	1.9%	-0.7%	4.5%
		2	1.0%	-1.6%	3.6%
		3	0.5%	-2.0%	3.1%
		4	-0.4%	-2.9%	2.1%
		5	2.2%	-0.3%	4.7%
		6	-2.1%	-4.5%	0.4%
	Injuries	0	5.8%	4.0%	7.6%
		1	3.9%	2.1%	5.7%
		2	0.1%	-1.6%	1.9%
		3	0.8%	-1.0%	2.6%
		4	2.1%	0.3%	4.0%
		5	0.5%	-1.2%	2.4%
		6	2.1%	0.3%	3.9%
	Neuropsychiatric conditions	0	2.8%	1.2%	4.5%
		1	1.3%	-0.3%	3.0%
		2	1.4%	-0.2%	3.0%
		3	1.3%	-0.2%	3.0%

SVI	Cause	Lag (months)	Percentage change	95% Credible Interval (CrI)	
SVI 2		4	1.3%	-0.3%	2.9%
		5	0.0%	-1.5%	1.6%
		6	0.3%	-1.3%	1.9%
	Respiratory diseases	0	0.8%	-0.8%	2.5%
		1	1.9%	0.2%	3.5%
		2	-0.1%	-1.6%	1.5%
		3	0.8%	-0.7%	2.3%
		4	-0.5%	-1.9%	0.9%
		5	0.0%	-1.4%	1.4%
		6	-1.9%	-3.2%	-0.5%
SVI 3	Cancers	0	0.1%	-1.1%	1.4%
		1	-0.1%	-1.3%	1.1%
		2	0.1%	-1.1%	1.4%
		3	0.7%	-0.6%	1.9%
		4	-0.4%	-1.6%	0.8%
		5	0.2%	-1.0%	1.4%
		6	0.1%	-1.1%	1.3%
	Cardiovascular diseases	0	0.2%	-0.8%	1.3%
		1	0.6%	-0.4%	1.6%
		2	1.0%	0.0%	2.0%
		3	1.0%	0.0%	2.0%
		4	-0.1%	-1.0%	0.9%
		5	0.5%	-0.5%	1.5%
		6	-0.3%	-1.3%	0.7%
	Infectious and parasitic diseases	0	1.1%	-2.0%	4.4%
		1	2.6%	-0.5%	5.8%
		2	1.5%	-1.6%	4.7%
		3	1.1%	-1.9%	4.2%
		4	-3.1%	-6.0%	-0.1%
		5	2.2%	-0.9%	5.3%
		6	-1.3%	-4.3%	1.8%
	Injuries	0	3.0%	0.7%	5.3%
		1	5.5%	3.1%	7.8%
		2	-2.0%	-4.2%	0.3%
		3	2.2%	-0.2%	4.6%
		4	-0.7%	-3.0%	1.7%
		5	0.5%	-1.8%	2.9%
		6	-1.1%	-3.4%	1.3%
	Neuropsychiatric conditions	0	-1.4%	-3.5%	0.8%
		1	0.4%	-1.7%	2.6%

SVI	Cause	Lag (months)	Percentage change	95% Credible Interval (CrI)	
SVI 3		2	-1.6%	-3.6%	0.6%
		3	-0.2%	-2.3%	2.0%
		4	-1.7%	-3.8%	0.5%
		5	-0.3%	-2.4%	1.8%
		6	-1.7%	-3.8%	0.5%
	Respiratory diseases	0	-0.5%	-2.6%	1.6%
		1	1.0%	-1.0%	3.2%
		2	1.4%	-0.7%	3.4%
		3	3.0%	1.1%	5.0%
		4	-0.8%	-2.6%	1.1%
		5	0.8%	-1.1%	2.6%
		6	-2.4%	-4.3%	-0.6%

eTable 7. Posterior probability for cancers that one effect estimate was larger than another, using comparisons of 1,000 draws the posterior marginal distribution of each effect estimate.

Wind exposure	Comparison	Lag (months)	Posterior probability
All	Hurricanes> Tropical cyclones	0	0.40
		1	0.39
		2	0.05
		3	0.28
		4	0.61
		5	0.86
		6	0.83
Hurricanes	Female>Male	0	0.58
		1	0.65
		2	0.31
		3	0.93
		4	0.12
		5	0.42
		6	0.96
	Older>Younger	0	0.29
		1	0.46
		2	0.57
		3	0.76
		4	0.49
		5	0.49
		6	0.70
	SVI 3>SVI 1	0	0.39
		1	>0.99
		2	0.73
		3	0.94
		4	0.97
		5	0.89
		6	0.64
Tropical cyclones	Female>Male	0	0.36
		1	0.49
		2	0.78
		3	0.58
		4	0.55
		5	0.08
		6	0.41
	Older>Younger	0	0.04
		1	0.71
		2	0.03

Wind exposure	Comparison	Lag (months)	Posterior probability
Tropical cyclones	Older>Younger	3	0.92
		4	0.61
		5	0.89
		6	0.62
	SVI 3>SVI 1	0	0.44
		1	0.34
		2	0.14
		3	0.18
		4	0.24
		5	0.22
		6	0.76

eTable 8. Posterior probability for cardiovascular diseases that one effect estimate was larger than another, using comparisons of 1,000 draws the posterior marginal distribution of each effect estimate.

Wind exposure	Comparison	Lag (months)	Posterior probability
All	Hurricanes> Tropical cyclones	0	>0.99
		1	>0.99
		2	0.61
		3	0.35
		4	0.15
		5	0.39
		6	0.70
Hurricanes	Female>Male	0	0.20
		1	0.44
		2	0.61
		3	0.09
		4	0.31
		5	0.49
		6	0.78
	Older>Younger	0	0.12
		1	0.96
		2	0.70
		3	0.84
		4	0.03
		5	0.52
		6	0.39
	SVI 3>SVI 1	0	0.65
		1	0.21
		2	0.73
		3	0.70
		4	0.99
		5	0.43
		6	>0.99
Tropical cyclones	Female>Male	0	0.46
		1	0.93
		2	0.12
		3	0.29
		4	0.34
		5	0.52
		6	0.07
	Older>Younger	0	0.65
		1	0.62

Wind exposure	Comparison	Lag (months)	Posterior probability
	Older>Younger	2	0.55
		3	0.84
		4	0.31
		5	0.72
		6	0.11
	SVI 3>SVI 1	0	0.14
		1	0.16
		2	0.65
		3	0.14
		4	0.20
		5	0.13
		6	0.48

eTable 9. Posterior probability for infectious and parasitic diseases that one effect estimate was larger than another, using comparisons of 1,000 draws the posterior marginal distribution of each effect estimate.

Wind exposure	Comparison	Lag (months)	Posterior probability
All	Hurricanes> Tropical cyclones	0	0.86
		1	0.95
		2	>0.99
		3	0.66
		4	0.92
		5	0.24
		6	0.89
Hurricanes	Female>Male	0	0.10
		1	0.75
		2	0.19
		3	0.17
		4	0.86
		5	0.50
		6	0.50
	Older>Younger	0	0.98
		1	0.62
		2	0.98
		3	0.01
		4	0.64
		5	0.83
		6	0.37
	SVI 3>SVI 1	0	0.12
		1	0.88
		2	0.80
		3	0.94
		4	0.92
		5	0.98
		6	0.95
Tropical cyclones	Female>Male	0	0.31
		1	0.19
		2	0.55
		3	0.56
		4	0.10
		5	0.83
		6	0.61
	Older>Younger	0	0.60
		1	0.32

Wind exposure	Comparison	Lag (months)	Posterior probability
	Older>Younger	2	0.13
		3	0.08
		4	0.08
		5	0.24
		6	0.62
	SVI 3>SVI 1	0	0.54
		1	0.71
		2	0.78
		3	0.81
		4	0.40
		5	0.98
		6	0.48

eTable 10. Posterior probability for injuries that one effect estimate was larger than another, using comparisons of 1,000 draws the posterior marginal distribution of each effect estimate.

Wind exposure	Comparison	Lag (months)	Posterior probability
All	Hurricanes> Tropical cyclones	0	>0.99
		1	0.95
		2	0.14
		3	0.94
		4	0.85
		5	0.39
		6	0.44
Hurricanes	Female>Male	0	>0.99
		1	0.9
		2	0.44
		3	0.94
		4	0.28
		5	0.46
		6	0.2
	Older>Younger	0	>0.99
		1	0.92
		2	0.88
		3	>0.99
		4	0.98
		5	0.83
		6	0.78
	SVI 3>SVI 1	0	>0.99
		1	0.33
		2	0.14
		3	0.25
		4	0.3
		5	0.46
		6	0.27
Tropical cyclones	Female>Male	0	0.86
		1	0.59
		2	0.77
		3	0.98
		4	0.57
		5	0.04
		6	0.06
	Older>Younger	0	>0.99
		1	>0.99
		2	0.65

Wind exposure	Comparison	Lag (months)	Posterior probability
	Older>Younger	3	0.88
		4	0.16
		5	0.21
		6	0.19
	SVI 3>SVI 1	0	0.88
		1	0.96
		2	0.01
		3	0.26
		4	<0.01
		5	0.44
		6	0.04

eTable 11. Posterior probability for neuropsychiatric conditions that one effect estimate was larger than another, using comparisons of 1,000 draws the posterior marginal distribution of each effect estimate.

Wind exposure	Comparison	Lag (months)	Posterior probability
All	Hurricanes> Tropical cyclones	0	>0.99
		1	>0.99
		2	>0.99
		3	0.83
		4	0.51
		5	0.48
		6	0.74
Hurricanes	Female>Male	0	0.55
		1	0.55
		2	0.74
		3	0.42
		4	0.09
		5	0.6
		6	0.58
	Older>Younger	0	0.56
		1	0.37
		2	0.41
		3	0.91
		4	0.62
		5	0.02
		6	0.05
	SVI 3>SVI 1	0	0.5
		1	0.91
		2	0.22
		3	0.28
		4	0.83
		5	0.88
		6	0.87
Tropical cyclones	Female>Male	0	0.86
		1	0.06
		2	0.25
		3	0.91
		4	0.41
		5	0.21
		6	0.97
	Older>Younger	0	0.71
		1	0.19

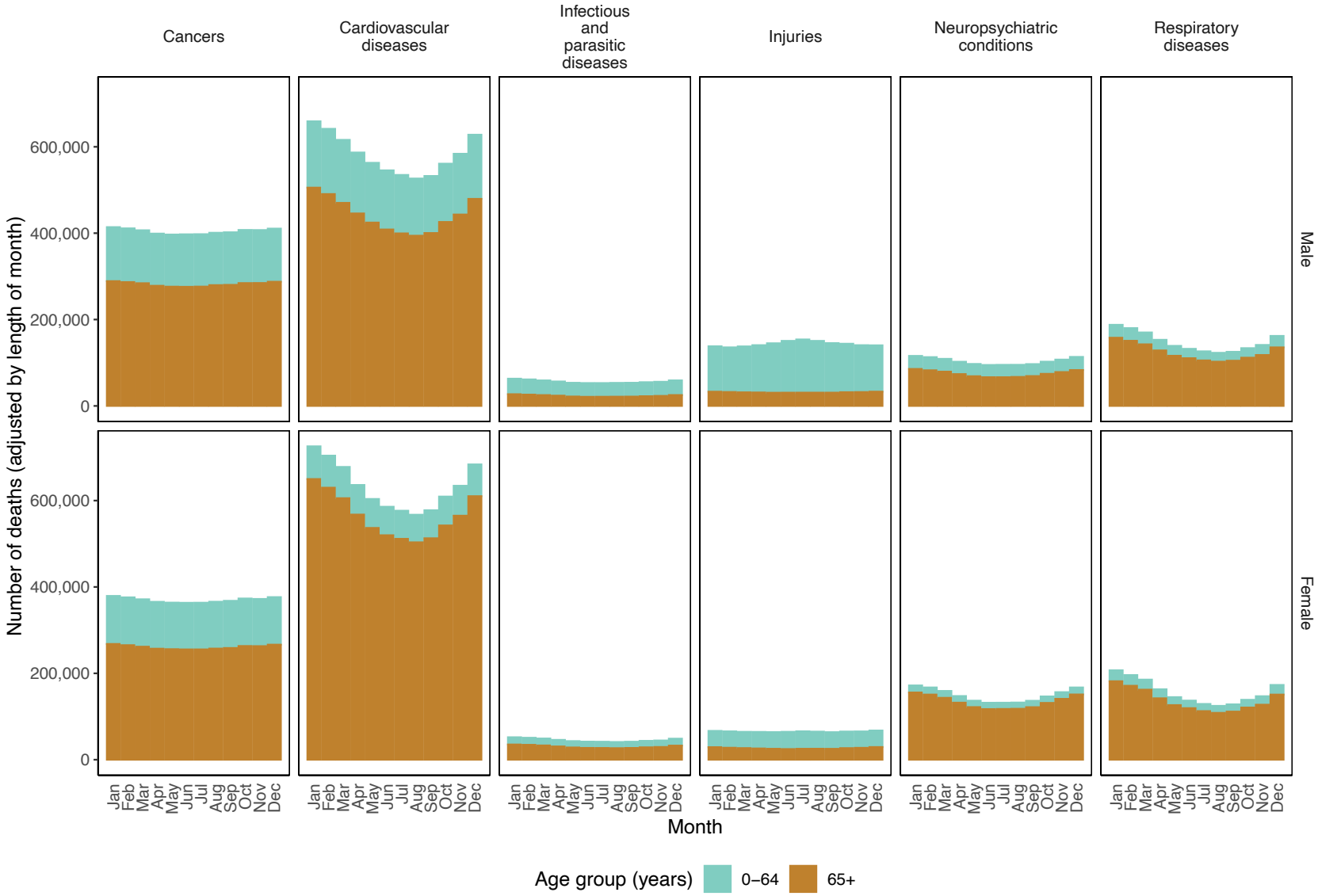
Wind exposure	Comparison	Lag (months)	Posterior probability
	Older>Younger	2	0.09
		3	0.49
		4	0.61
		5	0.21
		6	0.71
	SVI 3>SVI 1	0	0.62
		1	0.3
		2	0.13
		3	0.12
		4	0.18
		5	0.26
		6	0.4

eTable 12. Posterior probability for respiratory diseases that one effect estimate was larger than another, using comparisons of 1,000 draws the posterior marginal distribution of each effect estimate.

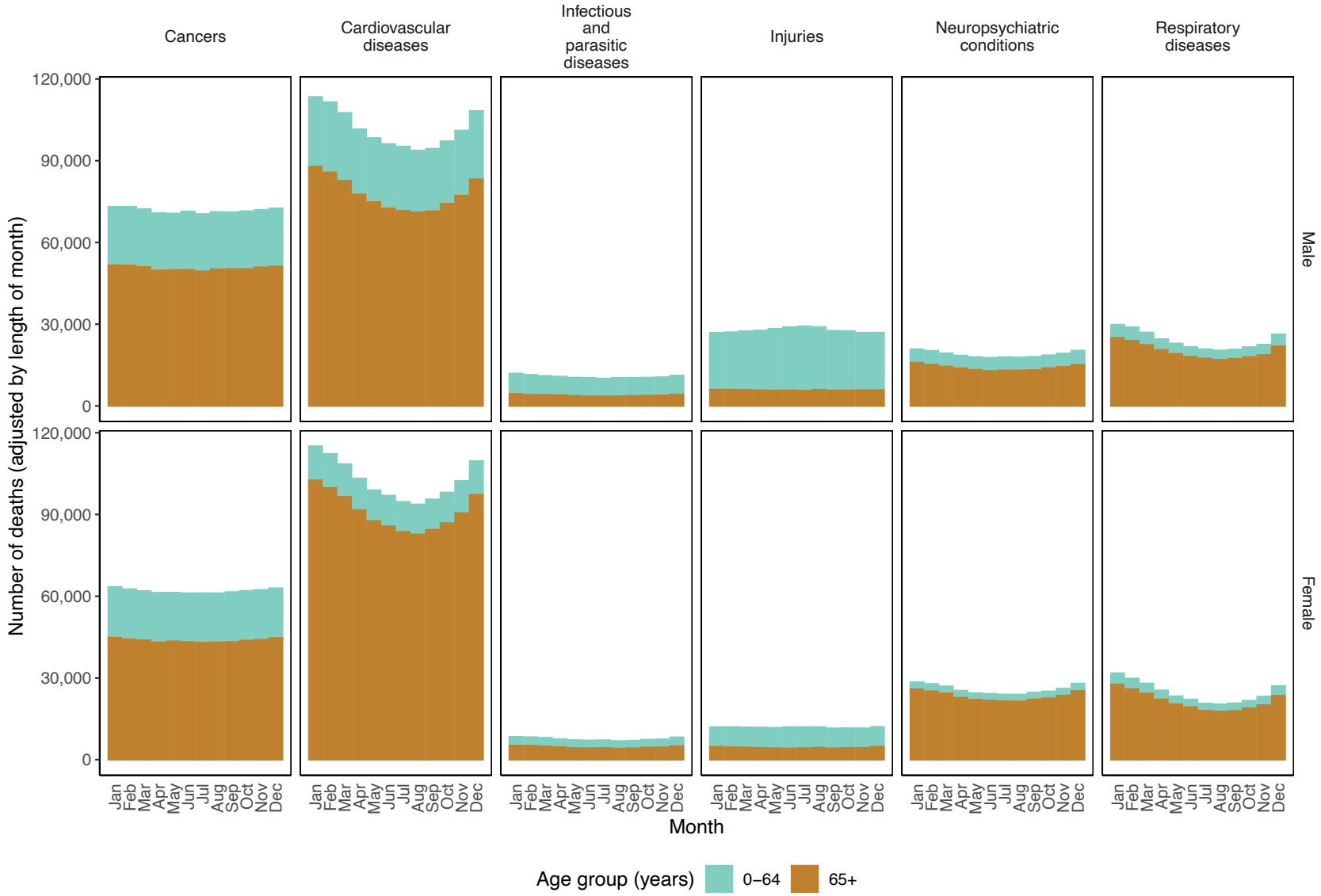
Wind exposure	Comparison	Lag (months)	Posterior probability
All	Hurricanes> Tropical cyclones	0	>0.99
		1	>0.99
		2	0.92
		3	0.11
		4	0.66
		5	0.49
		6	0.09
Hurricanes	Female>Male	0	0.88
		1	0.38
		2	0.72
		3	0.56
		4	0.81
		5	0.28
		6	0.88
	Older>Younger	0	0.88
		1	0.46
		2	0.92
		3	0.15
		4	0.71
		5	0.28
		6	0.17
	SVI 3>SVI 1	0	0.35
		1	0.69
		2	0.29
		3	0.49
		4	0.19
		5	0.62
		6	0.83
Tropical cyclones	Female>Male	0	0.09
		1	0.12
		2	0.22
		3	0.10
		4	0.10
		5	0.91
		6	0.93
	Older>Younger	0	0.90
		1	0.70

Wind exposure	Comparison	Lag (months)	Posterior probability
	Older>Younger	2	0.18
		3	0.38
		4	0.58
		5	0.36
		6	0.26
	SVI 3>SVI 1	0	0.6
		1	0.64
		2	0.98
		3	0.94
		4	0.7
		5	0.51
		6	0.12

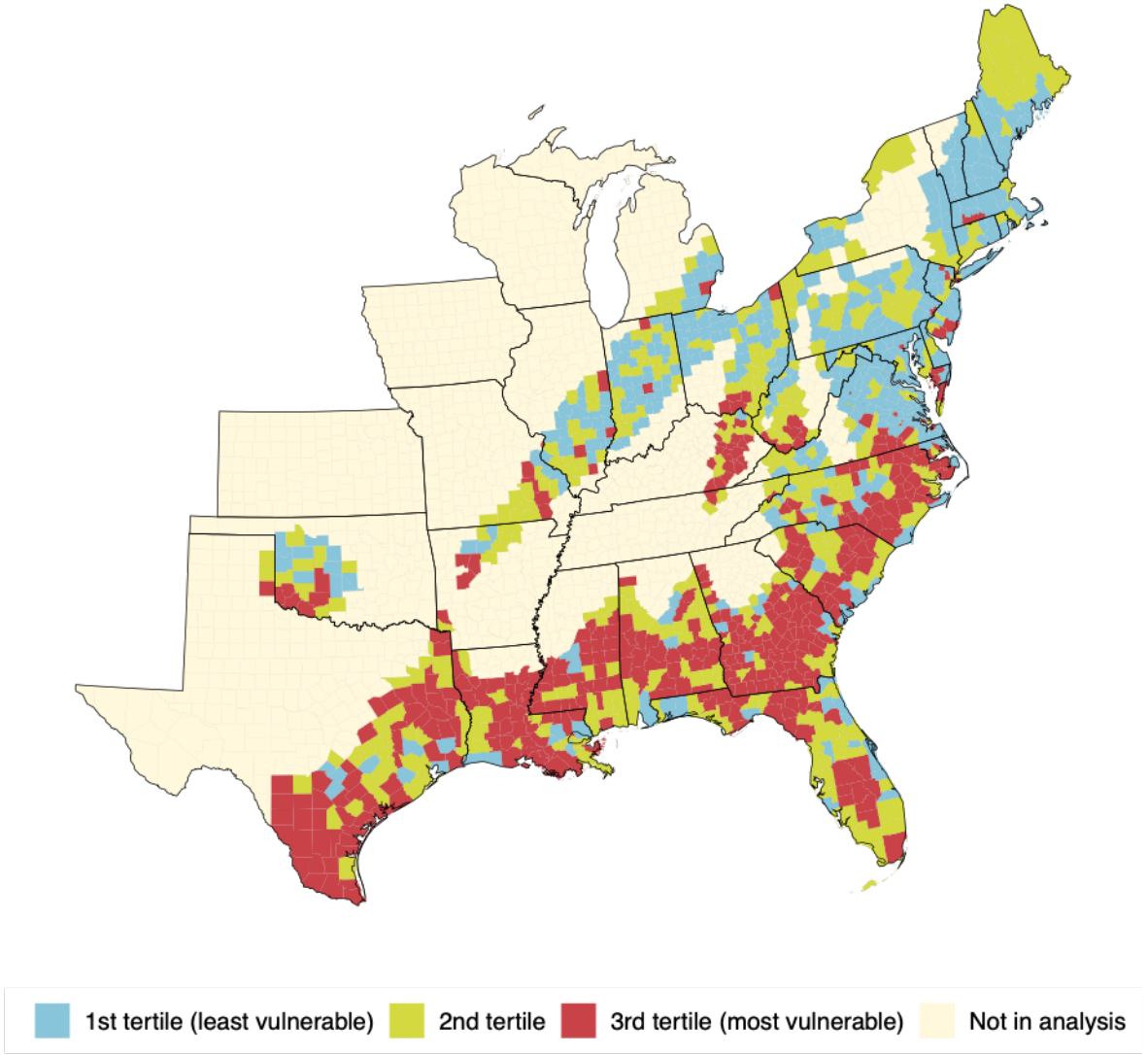
eFigure 1. Best-track routes of each tropical cyclone listed in Table 1 in main paper by year, 1980 – 2018.



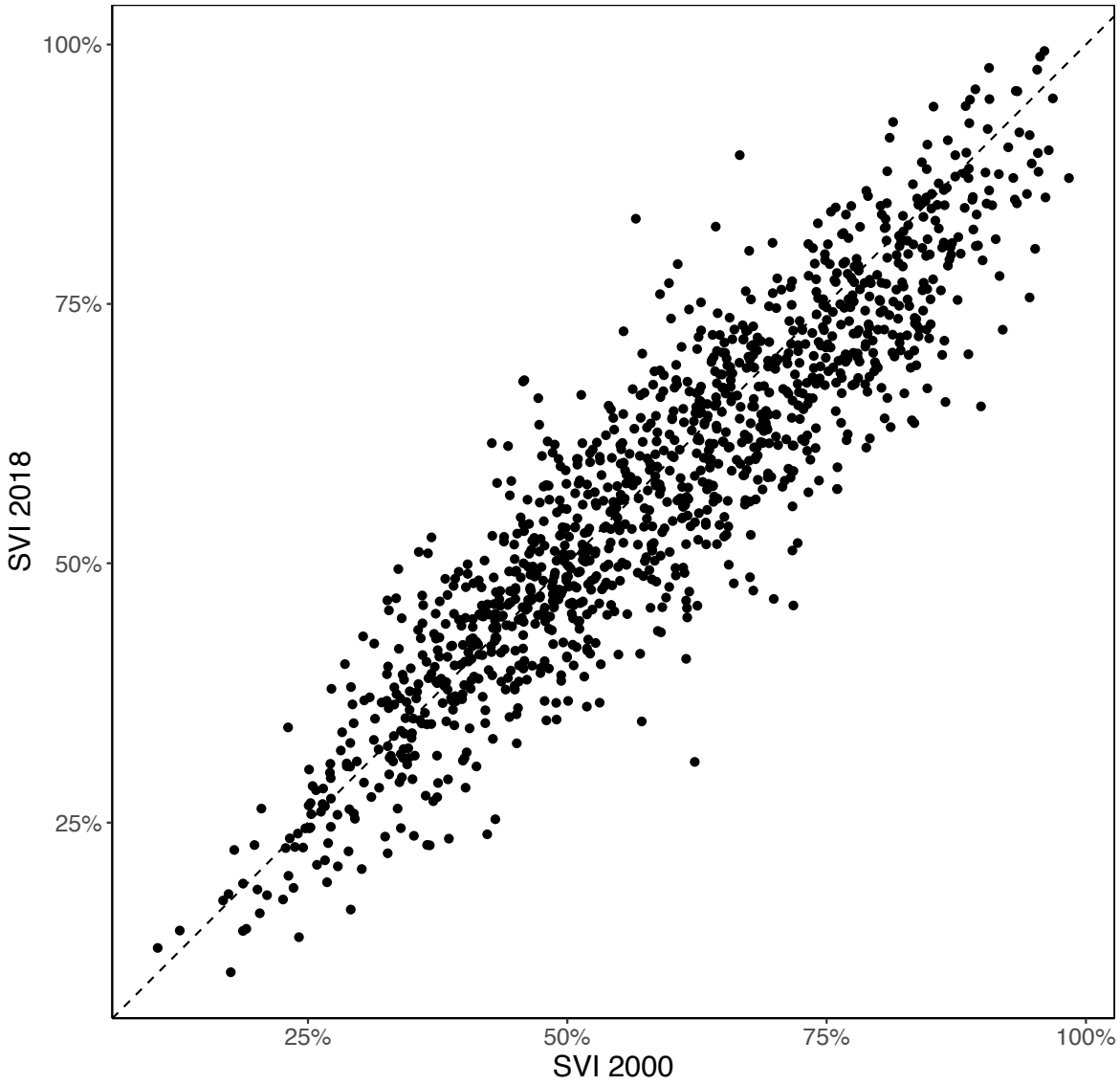
eFigure 2. Number of deaths by cause, month, sex, and age group (0-64 years, 65+ years) in counties exposed to tropical cyclones in the United States for 1988 – 2018. The values in the plot represent the total counts of deaths in any county with at least one tropical cyclone exposure (n=33,619,393). Pneumonia-type deaths were classified as respiratory diseases.



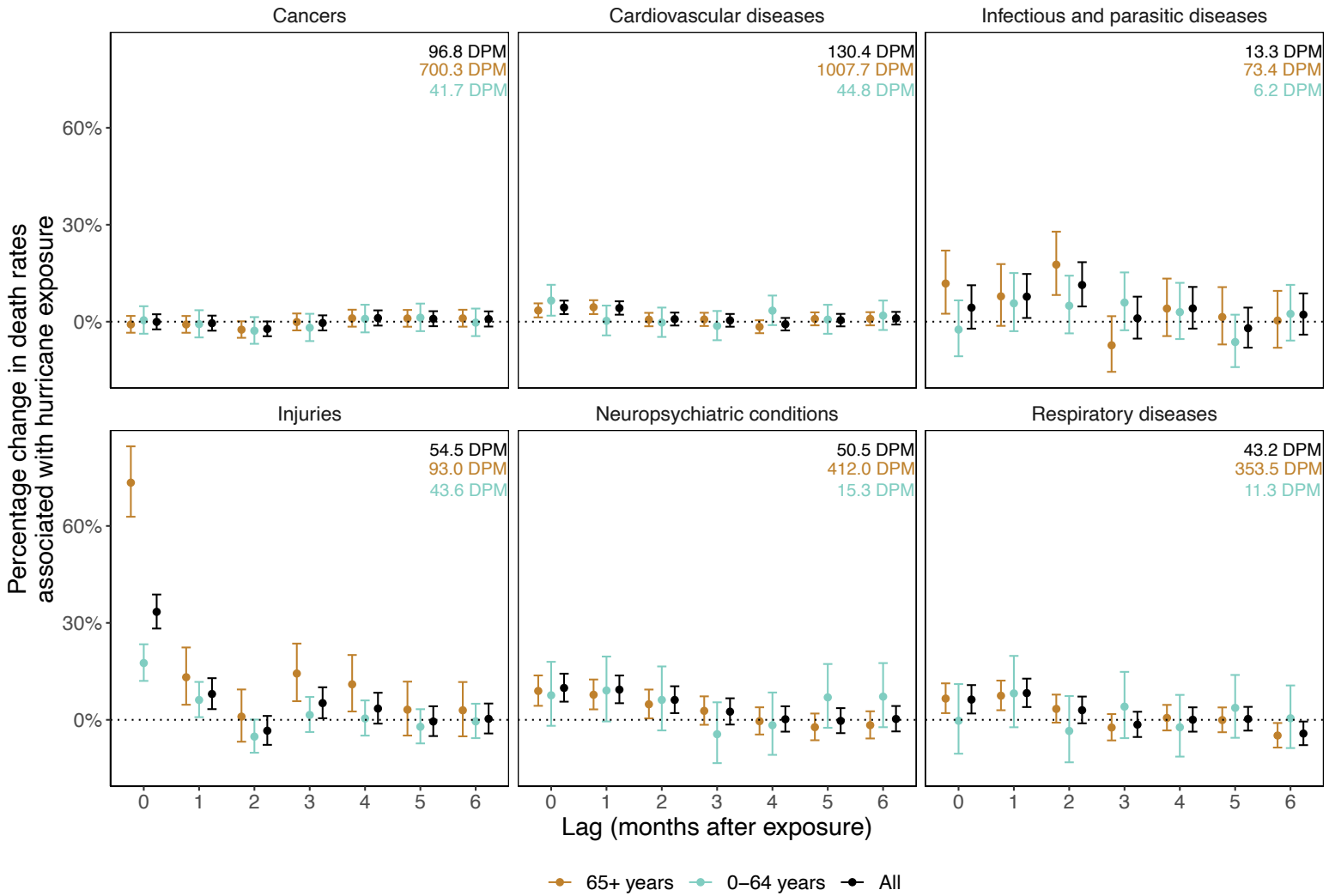
eFigure 3. Number of deaths by cause, month, sex, and age group (0-64 years, 65+ years) in counties exposed to hurricanes in the United States for 1988 – 2018. The values in the plot represent the total counts of deaths in any county with at least one hurricane exposure (n=5,749,787). Pneumonia-type deaths are classified as respiratory diseases.



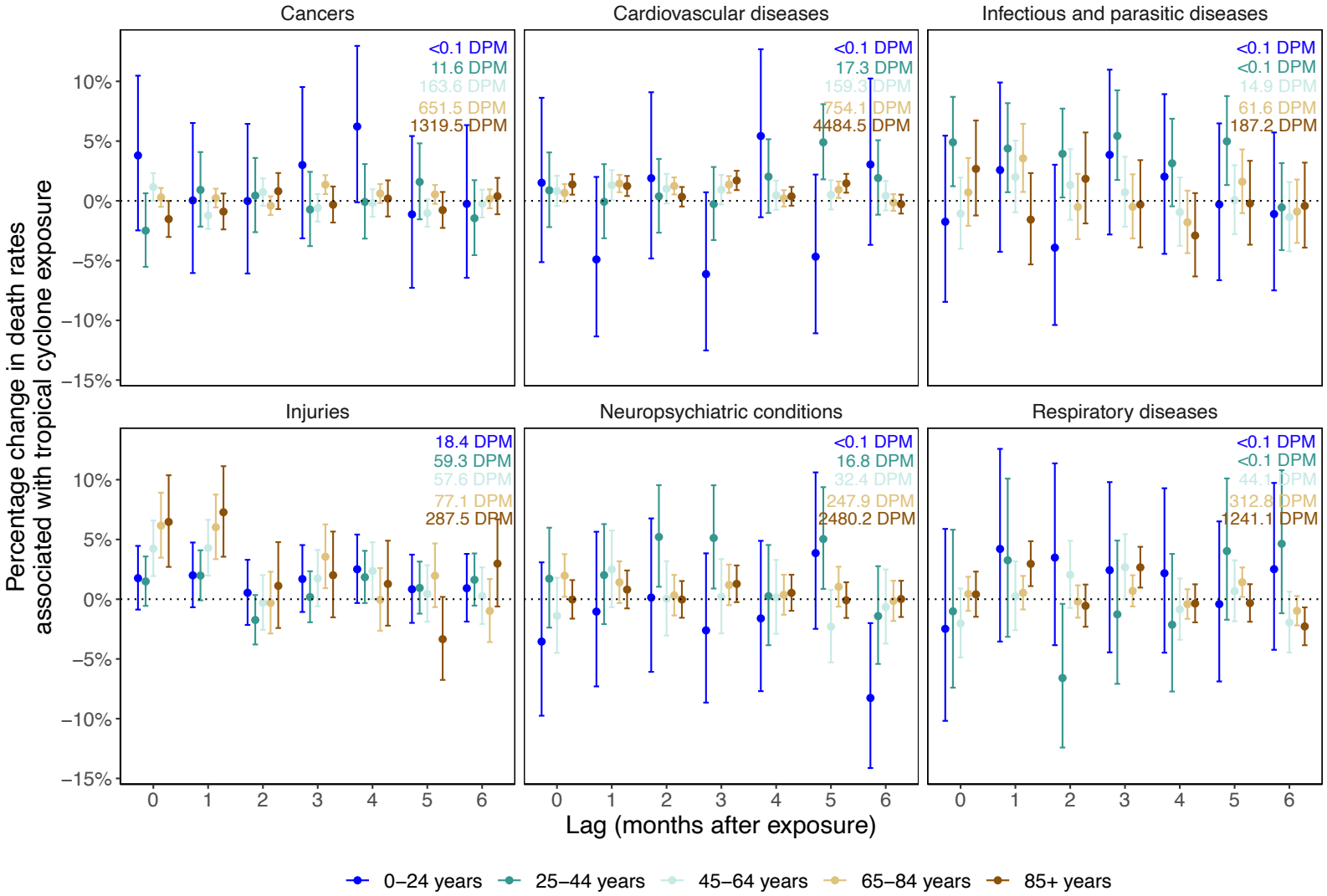
eFigure 4. 2018 Social Vulnerability Index (SVI) tertiles for included counties (n=1,206). The range is from 1 (least vulnerable) to 3 (most vulnerable).



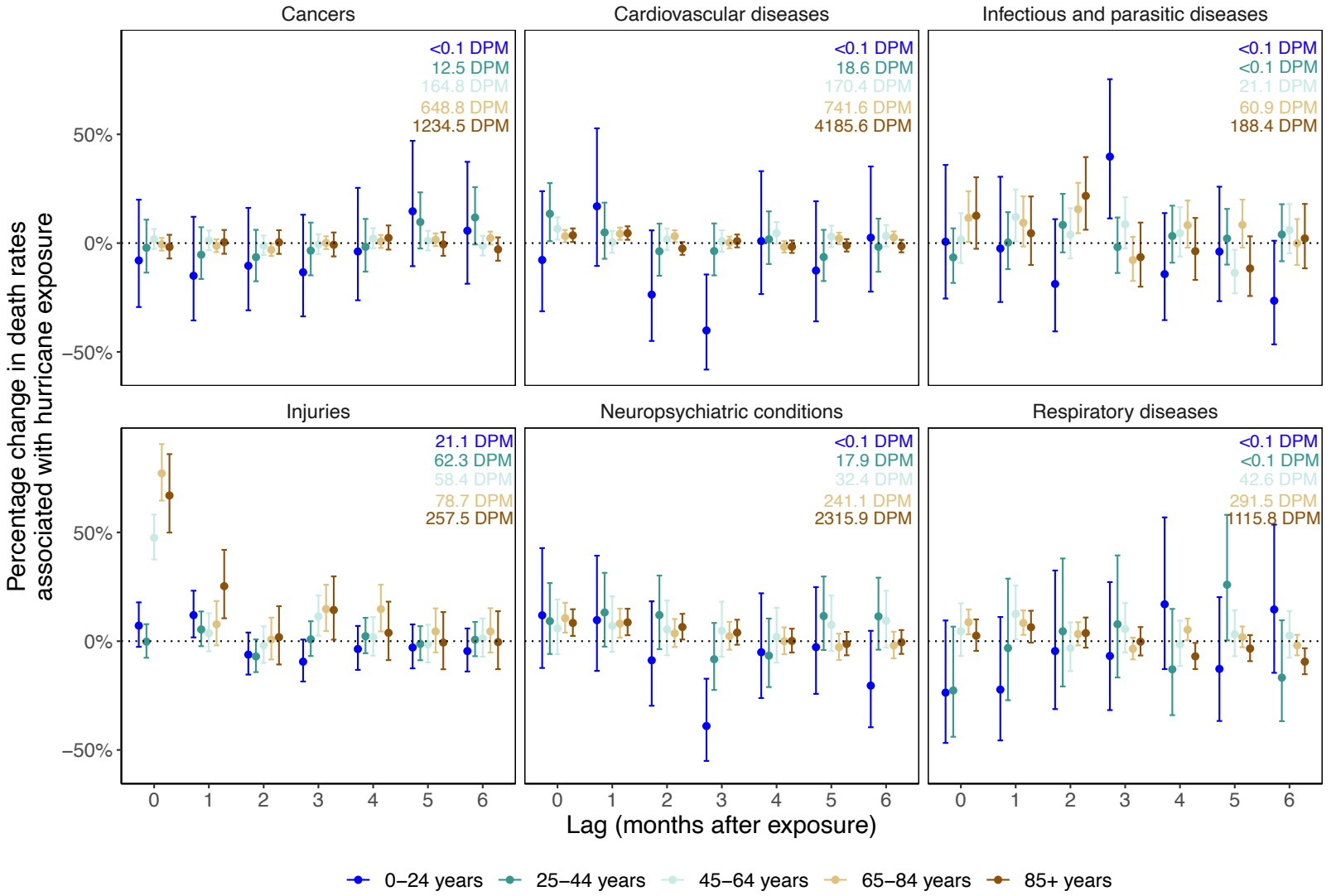
eFigure 5. Comparison of Social Vulnerability Index (SVI) percentiles for 2000 and 2018 for included counties (n=1,206). The range is from 0% (least vulnerable) to 100% (most vulnerable).



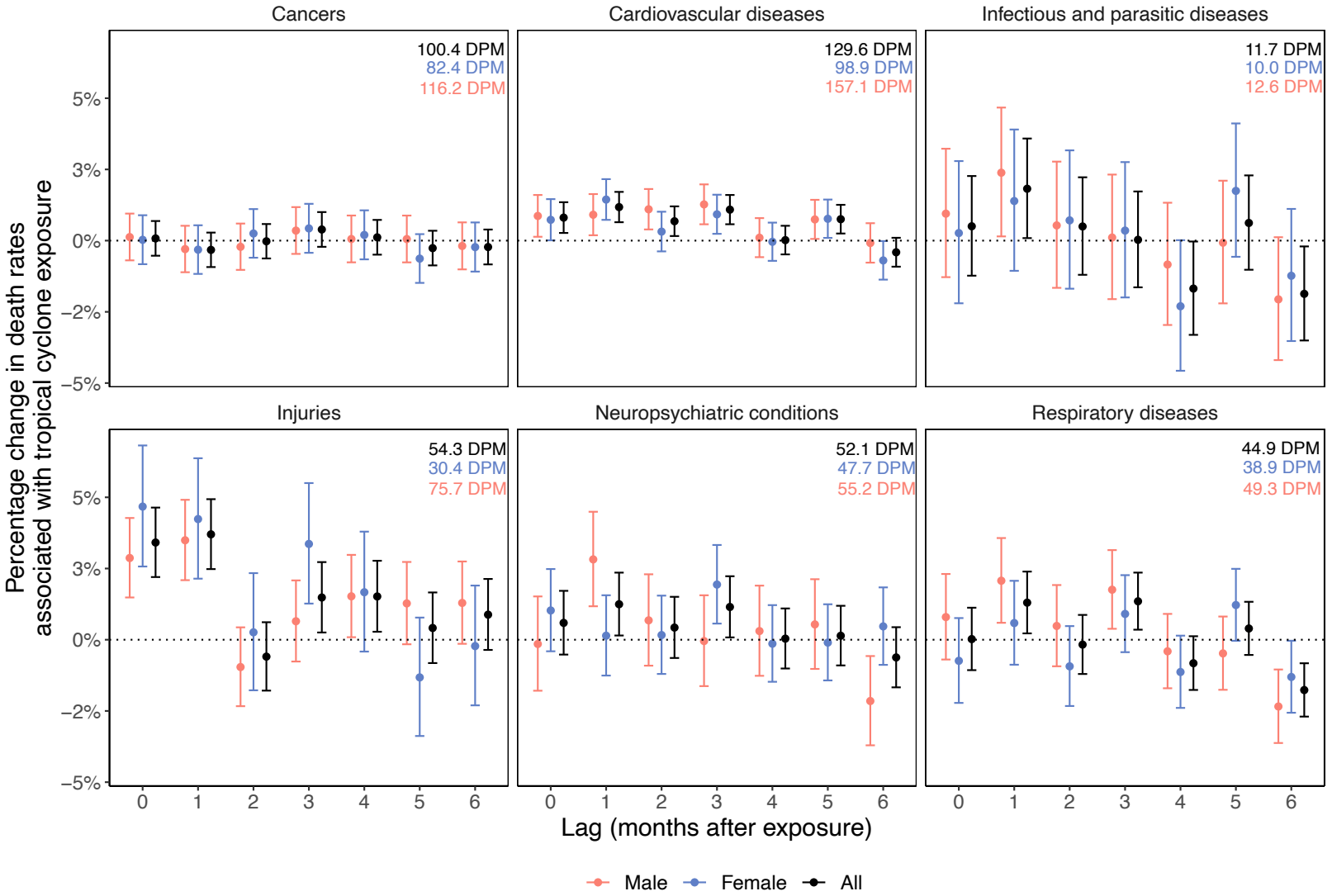
eFigure 6. Percentage change in death rates per one day increase in monthly hurricane exposure by cause of death, age group (0-64 years, 65+ years), and lag time. Lag time was measured in months after hurricane. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and age group-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for hurricane-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.



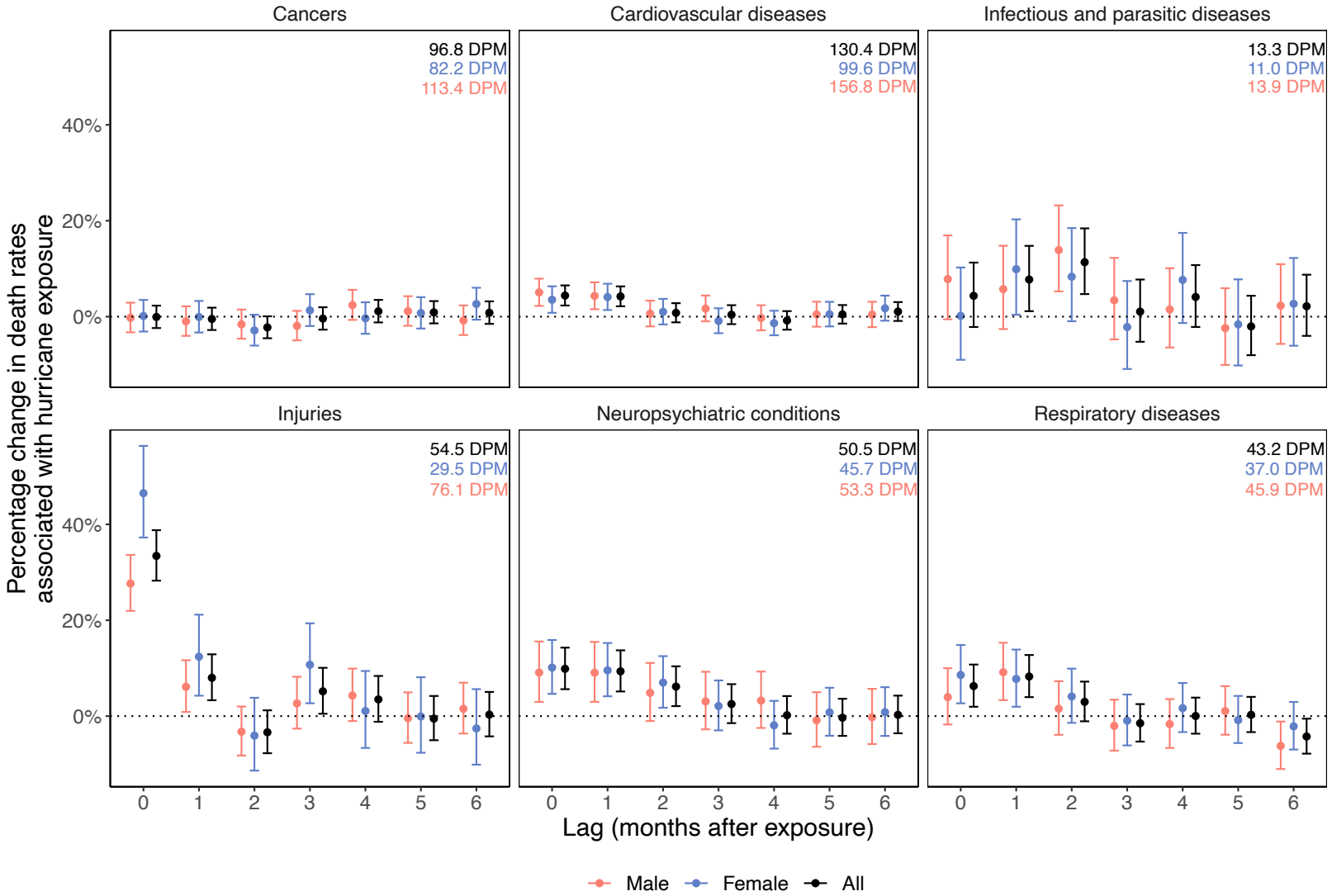
eFigure 7. Percentage change in death rates per one day increase in monthly tropical cyclone exposure by cause of death, age group (0-24 years, 25-44 years, 45-64 years, 65-84 years and 85+ years), and lag time. Lag time was measured in months after tropical cyclone. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and age group-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for tropical cyclone-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.



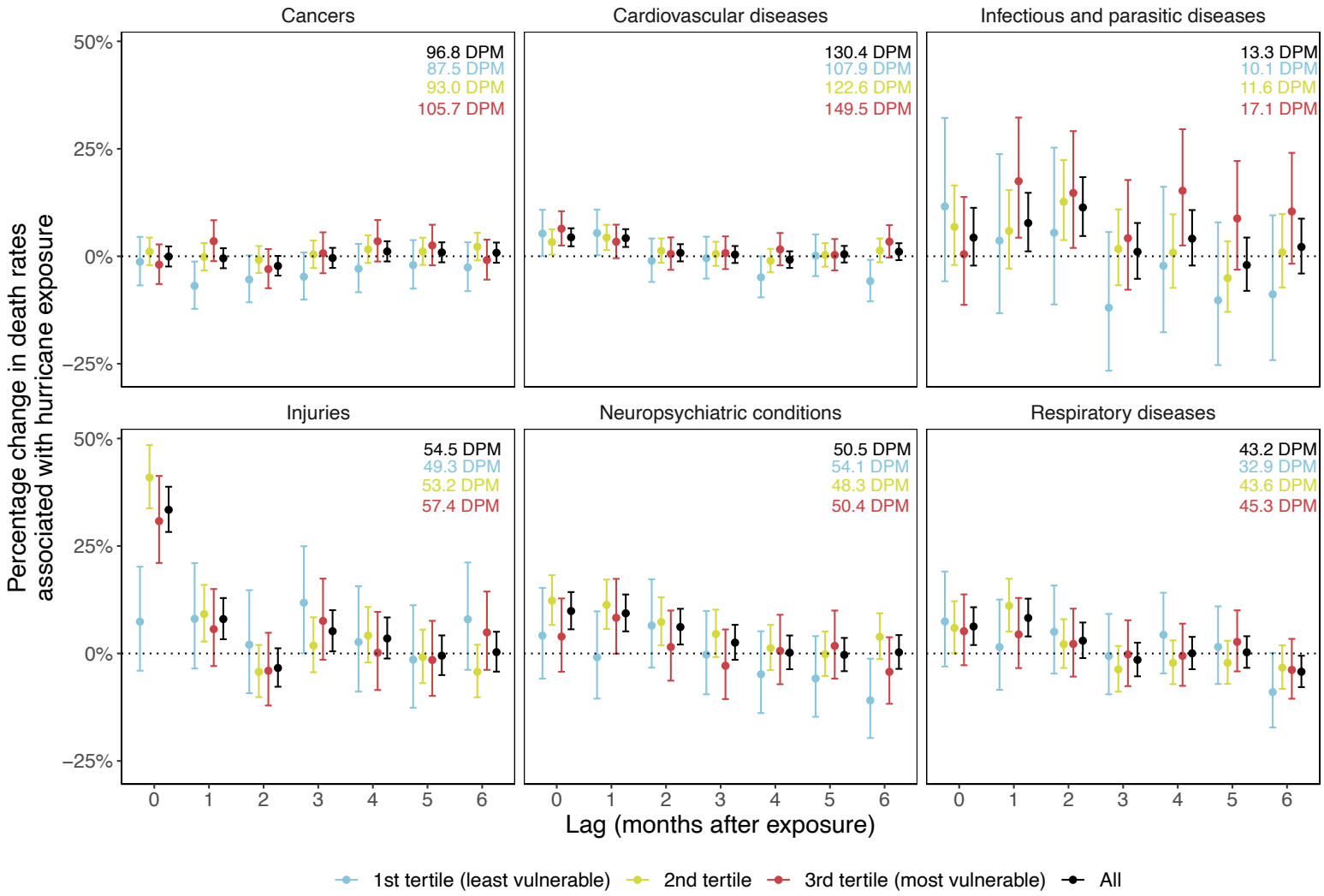
eFigure 8. Percentage change in death rates per one day increase in monthly hurricane exposure by cause of death, age group (0-24 years, 25-44 years, 45-64 years, 65-84 years and 85+ years), and lag time. Lag time was measured in months after hurricane. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and age group-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for hurricane-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.



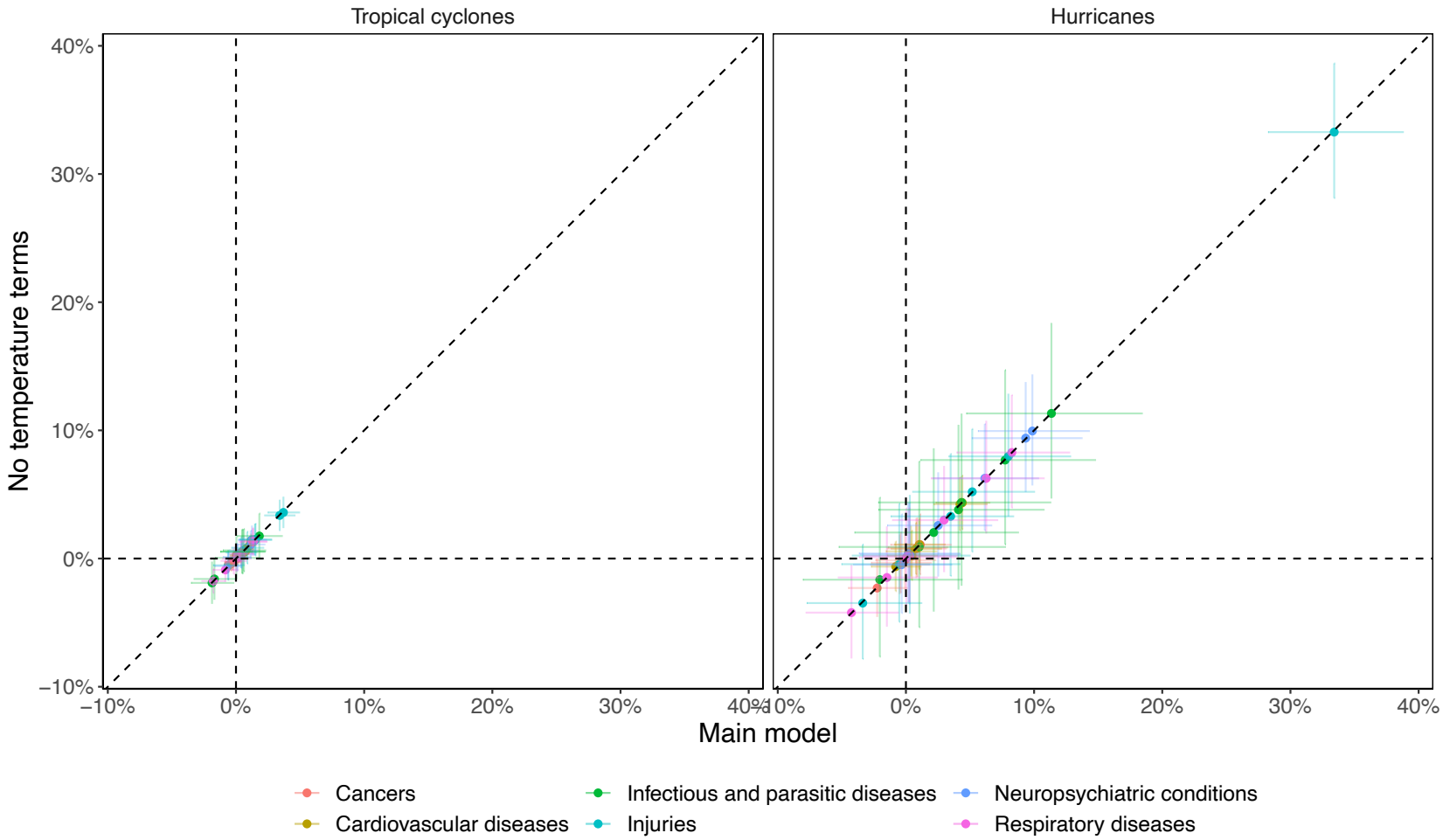
eFigure 9. Percentage change in death rates per one day increase in monthly tropical cyclone exposure by cause of death, sex, and lag time. Lag time was measured in months after tropical cyclone. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and sex-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for tropical cyclone-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.



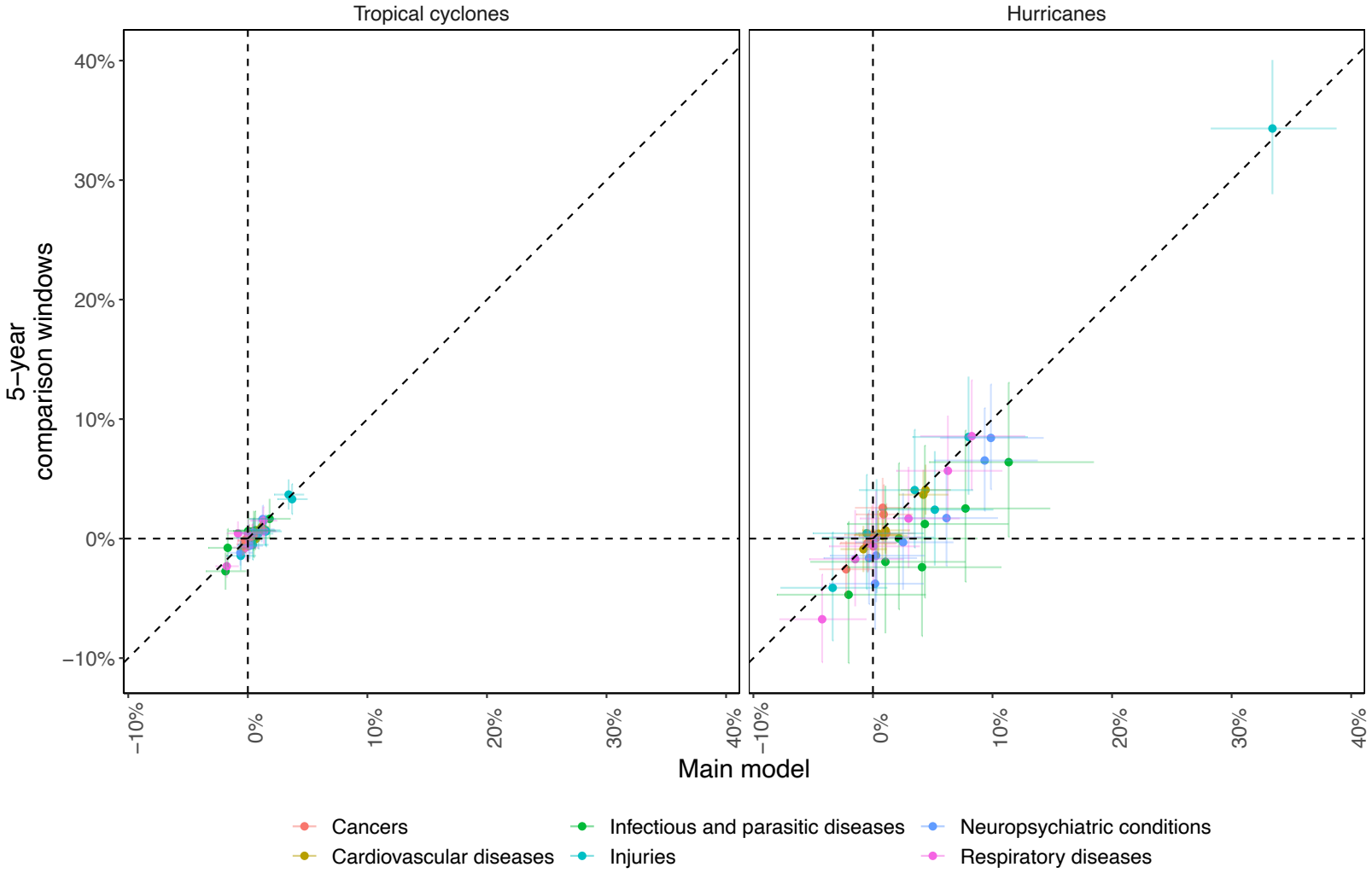
eFigure 10. Percentage change in death rates per one day increase in monthly hurricane exposure by cause of death, sex, and lag time. Lag time was measured in months after hurricane. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and sex-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for hurricane-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.



eFigure 11. Percentage change in death rates per one day increase in monthly hurricane exposure by cause of death, social vulnerability tertiles, and lag time. The first tertile (blue) represents lowest social vulnerability and the third tertile (red) represents highest social vulnerability. Lag time was measured in months after hurricane. Dots show the point estimates and whiskers represent 95% credible intervals. Numbers in the top-right of each panel represent overall and social vulnerability tertile-specific deaths per 1,000,000 for 2018 monthly age-standardized median rate (DPM) for hurricane-exposed counties. Pneumonia-type deaths were classified as respiratory diseases.



eFigure 12. Comparison of lag-specific coefficients by class of tropical cyclone when including or not including temperature term ($\nu_{temperature_{ct}}$). The values from the main model are on the x-axis with values from alternative model without temperature on the y-axis. Dots show the point estimates and whiskers represent 95% credible intervals. Pneumonia-type deaths were classified as respiratory diseases.



eFigure 13. Comparison of lag-specific coefficients by class of tropical cyclone when including or not including limit on matching control periods. The values from the main model are on the x-axis with values from alternative model with constraint of matched control periods being in same 5-year on the y-axis. Dots show the point estimates and whiskers represent 95% credible intervals. Pneumonia-type deaths were classified as respiratory diseases.