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Supplemental Table 1. Major fire events occurred 2008-2012 in the United States*.

State	Fire Name	Area burnt (acres)	Fire Origin Point		Start date	Containment date	End date
			Longitude	Latitude			
Arizona	HORSESHOE 2	222,954	-109.2111	31.8197	5/8/11	6/25/11	8/17/11
Arizona	WALLOW	538,049	-109.4497	33.6061	5/29/11	7/12/11	9/23/11
Arizona	MURPHY	68,079	-111.1578	31.5406	5/30/11	7/21/11	8/2/11
Arizona	Horseshoe 2	222,954	-109.2111	31.8197	NA	7/14/11	8/17/11
California	INDIANS	81,378	-121.4308	36.1053	6/8/08	7/10/08	NA
California	MILL	65,834	-123.5947	41.5633	6/20/08	10/3/08	12/31/08
California	BASIN COMPLEX	162,818	-121.6583	36.2811	6/21/08	7/27/08	NA
California	LA BREA	91,622	-119.9778	34.9497	8/8/09	8/22/09	10/14/09
California	STATION	160,371	-118.1889	34.2425	8/26/09	10/22/09	12/4/09
California	CHIPS	75,431	-121.2714	40.0069	7/28/12	10/25/12	NA
California	RUSH	315,579	-120.1153	40.6153	8/12/12	10/22/12	11/26/12
Colorado	HIGH PARK	87,275	-105.4036	40.5894	6/9/12	6/30/12	8/14/12
Florida	DOF Prarie Fire	68,295	-80.4694	25.8019	NA	6/15/11	6/17/11
Georgia	HONEY PRAIRIE	309,200	-82.3686	30.7297	4/29/11	12/22/11	NA
Idaho	Jefferson	108,855	-112.8808	43.5297	7/13/10	7/20/10	8/12/10
Idaho	Long Butte	306,113	-115.5397	42.6050	8/21/10	NA	9/10/10
Idaho	BIG HILL	67,061	-115.9073	42.6629	8/14/11	8/18/11	8/20/11
Idaho	HALSTEAD	181,948	-115.1722	44.4297	7/27/12	10/24/12	11/26/12
Idaho	MUSTANG	275,960	-114.5900	45.4250	7/28/12	11/5/12	11/29/12
Idaho	TRINITY RIDGE	146,832	-115.3656	43.7111	8/3/12	10/22/12	11/26/12
Idaho	CAVE CANYON	88,909	-114.0600	42.2775	8/5/12	8/23/12	10/9/12
Idaho	LOST PACKER	52,008	-114.7617	45.4714	8/12/12	8/14/12	8/14/12
Idaho	Flat Top 2	140,954	-113.7497	42.9594	NA	8/13/12	9/3/12

Idaho	Kinyon Road	210,874	-115.0253	42.4533	NA	7/15/12	7/19/12
Minnesota	PAGAMI CREEK	92,682	-91.5242	47.9056	8/16/11	11/28/11	4/19/12
Minnesota	Highway One RxB	68,643	-95.3333	48.0500	NA	NA	4/13/09
Montana	Dunn Mountain	102,383	-108.3494	46.2404	8/22/08	8/25/08	9/28/08
Montana	ASH CREEK	249,562	-106.4692	45.6697	6/25/12	7/27/12	8/21/12
Montana	TAYLOR CREEK	62,111	-106.0525	45.2425	7/3/12	7/27/12	10/1/12
Montana	EAST SARPY	82,127	-107.1676	45.7464	NA	NA	8/25/12
Montana	ROSEBUD COMPLEX	152,261	-106.2111	46.1614	NA	8/18/12	8/19/12
Montana	SE Montana Complex	60,979	-105.8864	46.4281	NA	7/27/12	10/1/12
Nebraska	WEST ASH	56,471	-103.2533	42.6244	8/28/12	10/1/12	11/26/12
Nebraska	Region 23 Complex	86,201	-103.4128	42.6830	8/29/12	9/11/12	12/5/12
Nevada	E. SLIDE ROCK RIDGE	54,545	-115.3267	41.7800	8/10/08	12/16/08	12/16/08
Nevada	INDIAN CREEK	110,827	-116.2353	40.9486	9/30/11	10/12/11	10/13/11
Nevada	Holloway	215,541	-118.3650	41.9733	NA	8/31/12	9/20/12
Nevada	LOST	61,298	-119.7500	41.1389	NA	NA	10/24/12
New Mexico	CATO	55,080	-103.8900	33.4681	6/10/09	6/15/09	6/25/09
New Mexico	Pasco	95,000	-108.8625	31.3564	6/10/09	6/25/09	6/30/09
New Mexico	ENTERPRISE	64,936	-103.8006	33.0522	2/27/11	2/28/11	3/1/11
New Mexico	LAST CHANCE	53,342	-104.7522	32.2325	4/24/11	5/18/11	5/20/11
New Mexico	Miller	88,835	-108.3687	33.1437	4/28/11	6/21/11	6/30/11
New Mexico	LAS CONCHAS	126,554	-106.5367	35.8114	6/26/11	8/25/11	10/19/11
New Mexico	Whitewater-Baldy	297,845	-108.7103	33.3447	5/16/12	7/31/12	NA
Oklahoma	McNac	58,501	-96.4392	35.9567	NA	8/18/12	8/21/12
Oregon	COAL PLANT	78,000	-119.7678	45.6619	6/29/08	7/10/08	NA
Oregon	0655 RAZOR BACK EAST	51,384	-121.0789	45.0369	8/24/11	10/17/11	10/17/11
Oregon	Hancock Complex	67,921	-120.4325	44.9299	8/24/11	NA	10/6/11
Oregon	Barry Point	93,071	-120.8014	42.1117	NA	NA	NA

Oregon	CACHE CREEK	73,582	-116.9283	45.9864	NA	11/5/12	11/5/12
Oregon	Long Draw	558,198	-117.8937	42.3919	NA	7/30/12	10/15/12
Oregon	Miller Homestead	160,801	-119.1750	42.8186	NA	11/16/12	11/16/12
Texas	BURNS RANCH	65,000	-98.3728	26.7994	3/18/08	3/25/08	NA
Texas	Crawford Ranch	60,000	-101.9164	35.6903	NA	4/10/11	4/11/11
Texas	West Texas I A	120,000	-98.9092	30.2431	NA	4/22/11	4/23/11
Utah	Clay Springs	107,847	-112.3881	39.3231	6/27/12	8/14/12	10/12/12
Wyoming	GUNBARREL	68,148	-109.8225	44.4950	7/26/08	9/27/08	12/15/08
Wyoming	FONTENELLE	65,220	-110.6006	42.4342	6/24/12	10/23/12	10/25/12
Wyoming	Arapaho	97,595	-105.4905	42.2009	6/27/12	10/9/12	10/9/12
Wyoming	Oil Creek	61,416	-104.2844	43.9148	6/29/12	10/9/12	10/12/12

* The fire information was from on Short KC. Spatial wildfire occurrence data for the United States, 1992-2015 [FPA_FOD_20170508] (4th Edition). (https://www.fs.fed.us/research/people/profile.php?alias=kcshort)

Supplemental Table 2. Classification of cause-specific mortality based on death cause codes and categorization from CMS 2746 form.

Codes	Description
Cardiac	
23	Myocardial infarction, acute
25	Pericarditis, incl. Cardiac tamponade
26	Atherosclerotic heart disease
27	Cardiomyopathy
28	Cardiac arrhythmia
29	Cardiac arrest, cause unknown
30	Valvular heart disease
31	Pulmonary edema due to exogenous fluid
32	Congestive Heart Failure
Vascular	
35	Pulmonary embolus
36	Cerebrovascular accident including intracranial hemorrhage
37	Ischemic brain damage/Anoxic encephalopathy
38	Hemorrhage from transplant site
39	Hemorrhage from vascular access
40	Hemorrhage from dialysis circuit
41	Hemorrhage from ruptured vascular aneurysm
42	Hemorrhage from surgery (not 38, 39, or 41)
43	Other hemorrhage (not 38-42, 72)
44	Mesenteric infarction/ischemic bowel
Infection	
33	Septicemia due to internal vascular access
34	Septicemia due to vascular access catheter
45	Peritoneal access infectious complication, bacterial
46	Peritoneal access infectious complications, fungal
47	Peritonitis (complication of peritoneal dialysis)
48	Central nervous system infection (brain abscess, meningitis, encephalitis, etc.)
51	Septicemia due to peripheral vascular disease, gangrene
52	Septicemia, other
61	Cardiac infection (endocarditis)
62	Pulmonary infection (pneumonia, influenza)
63	Abdominal infection (peritonitis (not comp of PD), perforated bowel, diverticular disease, gallbladder)
70	Genitor-urinary infection (urinary tract infection, pyelonephritis, renal abscess)
Other	
80	Bone marrow depression
81	Cachexia/failure to thrive
82	Malignant disease, patient ever on Immunosuppressive therapy
83	Malignant disease (not 82)

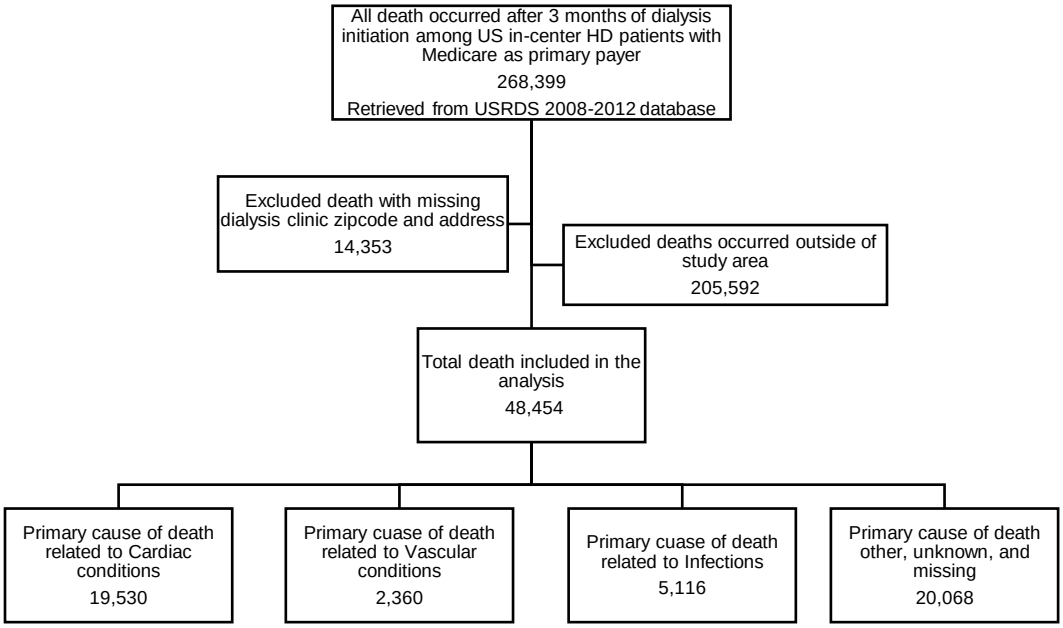
84	Dementia, incl. dialysis dementia, Alzheimer's
85	Seizures
87	Chronic obstructive lung disease (COPD)
88	Complications of surgery
89	Air embolism
104	Withdrawal from dialysis/uremia
92	Suicide
93	Drug overdose (street drugs)
94	Drug overdose (not 92 or 93)
98	Other cause of death
99	Unknown
Missing	Missing

Supplemental Table 3. Mortality count by cause of death and by place of death.

Cause*	Place of Death**		Overall N (%)
	Non-Clinical N (%)	Clinical N (%)	
All Cause	20,315 (41.9%)	28,139 (58.1%)	48,454 (100.0%)
Cardiac	6,579 (32.4%)	12,951(46.0%)	19,530 (40.3%)
Vascular	452 (2.2%)	1,908 (6.8%)	2,360 (4.9%)
Infection	692 (3.4%)	4,424 (15.7%)	5,116 (10.6%)
Other	12,155 (59.8%)	7,913 (28.1%)	20,068 (41.4%)

* Cause of death categories are based on CMS 2746 ESRD Death Notification cause of death coding and categories.
** Place of death definitions (based on CMS 2746 ESRD Death Notification), Clinical: Hospital, Dialysis Clinic; Non-Clinical: Home, Other, Nursing Home, Missing.

Supplemental Figure 1. Study Outcome Extraction Protocol



Supplemental Texts 1. Specification of distributed lag model.

With the same set of variables included in the quasi-Poisson model for same-day effect, terms of continuous wildfire-$PM_{2.5}$ and background-$PM_{2.5}$ were replaced with cross-basis matrices for wildfire-$PM_{2.5}$ and background-$PM_{2.5}$ constructed assuming the effect of $PM_{2.5}$ at lag 0 is linear while the effect beyond lag 0 (up to 1, 7, 14, and 30 days) is not, respectively. Regarding the bases for the space of the lags, the lagged effect of fire and background $PM_{2.5}$ was specified up to 1,7,14, and 30 days, with a 4-degree polynomial (restricted). The cross-basis matric for heat-index was built using a natural cubic spline with 5 degrees of freedom. A group function on the county was also included in the specification.

Supplemental Texts 2. Exposed Attributable Fraction Calculation

To calculate the attributable fraction among the exposed (EAF) we first calculated average rate ratio. We used risk coefficients estimated in the analysis β_1 and assumed no wildfire-$PM_{2.5}$ exposure to be the exposure minimum. The daily rate ratio was evaluated at the value of the daily wildfire-$PM_{2.5}$ concentration as $RRct = \exp(\beta_1 WildfirePM_{ct})$. Then, we calculated average rate ratio (RR_{EAF}) by county across all days and for days when wildfire-$PM_{2.5}$ was greater than 10 μg/m3 using the following equations:

$$RR_{EAF} = \frac{1}{n_t}\frac{1}{n_c}\sum_{c=1}^{n_c}\sum_{t=1}^{n_t} RR_{ct}$$

$$RR_{EAF} = \frac{\sum_{c=1}^{n_c}\sum_{t=1}^{n_t} RR_{ct}\ \mathrm{I}[Wildfire\ PM_{2.5}ct > 10]}{\sum_{c=1}^{n_c}\sum_{t=1}^{n_t} \mathrm{I}[Wildfire\ PM_{2.5ct}ct > 10]}$$

Summation over counties is omitted when rate ratio is calculated for each county. The exposed attributable fraction was evaluated as $(RR_{EAF} - 1)\ /RR_{EAF}$.

Supplemental Table 4. Individual lag day estimates for all-cause mortality.

Lag Day	Rate Ratio* (95% Confidence Interval)
0	1.02 (1.00, 1.03)
1	1.01 (1.00, 1.03)
2	1.01 (1.00. 1.02)
3	1.01 (1.00. 1.02)
4	1.01 (1.00, 1.01)
5	1.00 (1.00, 1.01)
6	1.00 (0.99, 1.01)
7	1.00 (0.99, 1.01)
8	1.00 (0.99, 1.01)
9	1.00 (0.99, 1.00)
10	1.00 (0.99, 1.00)
11	1.00 (0.99, 1.00)
12	1.00 (0.99, 1.00)
13	1.00 (0.99, 1.00)
14	1.00 (0.99, 1.00)
15	1.00 (0.99, 1.00)
16	1.00 (0.99, 1.01)
17	1.00 (0.99, 1.01)
18	1.00 (0.99, 1.01)
19	1.00 (1.00, 1.01)
20	1.00 (1.00, 1.01)
21	1.00 (1.00, 1.01)
22	1.00 (1.00, 1.01)
23	1.01 (1.00, 1.01)
24	1.01 (1.00, 1.01)
25	1.01 (1.00, 1.01)
26	1.00 (1.00, 1.01)
27	1.00 (1.00, 1.01)
28	1.00 (0.99, 1.01)
29	1.00 (0.99, 1.01)
30	0.99 (0.98, 1.01)

*Individual lag day's RR on all-cause mortality was extracted from distributed lag model with 0-30 lag period adjusting for background $PM_{2.5}$, heat index, day of the week, and continuous dates with an offset of modality.