

# **Supplemental Material**

**Table S1. List of fire stations staffed 24 hours per day and 7 days per week.**

<b>County</b>	<b>Name</b>	<b>Address</b>	<b>Note</b>
WAKE	Cary+G2:145 #8	408 Mills Park Dr	
WAKE	Hopkins	8933 Fowler Rd	
WAKE	Wendell #2	6529 Bethany Church Rd	
WAKE	Wake-New Hope #2	4909 Watkins Rd	
WAKE	Rolesville	104 E. Young St	Only staffed after 2012
WAKE	Wake Forest #1	420 E. Elm Av	
WAKE	Bay Leaf #1	11713 Six Forks Rd	
WAKE	Cary #9	875 SE Maynard Rd	
WAKE	Morrisville #3	6900 Carpenter Fire Station Rd	
WAKE	Morrisville #1	200 Town Hall Dr	
WAKE	Apex #2	3045 New Hill Holleman Rd	
WAKE	Apex #1	210 N. Salem St	
WAKE	Fuquay-Varina #1	301 S. Fuquay Ave	
WAKE	Fuquay-Varina #2	5617 Hilltop Rd	
WAKE	Garner #2	9115 Sauls Rd	
WAKE	Fairview #2	7401 Ten-Ten Rd	
WAKE	Fairview #1	4501 Ten-Ten Rd	
WAKE	Cary #4	1401 Old Apex Rd	
WAKE	Cary #1	1501 N. Harrison Ave	
WAKE	RDU CFR	1050 Rescue Ct	
WAKE	RFD #23	8312 Pinecrest Rd	
WAKE	RFD #17	4601 Pleasant Valley Rd	
WAKE	RFD #14	4220 Lake Boone Tr	
WAKE	Western Wake #1	4021 District Dr	
WAKE	RFD #8	5001 Western Blvd	
WAKE	RFD #20	1721 Trailwood Dr	
WAKE	RFD #2	263 Pecan Rd	
WAKE	Garner #1	503 W. Main St	
WAKE	RFD #3	13 S. East St	
WAKE	RFD #6	2601 Fairview Rd	
WAKE	RFD #7	2100 Glascock St	
WAKE	RFD #12	3409 Poole Rd	
WAKE	Eastern Wake #1	4828 Clifton Rd	
WAKE	Eastern Wake #2	401 Hester St	
WAKE	Wendell #1	2960 Wendell Blvd	
WAKE	Zebulon	113 E. Vance St	
WAKE	Stony Hill #1	7045 Stony Hill Rd	
WAKE	Stony Hill #2	15633 New Light Rd	
WAKE	Bay Leaf #2	13116 Norwood Rd	

<b>WAKE</b>	Durham Highway #1	11905 Norwood Rd	
<b>WAKE</b>	RFD #18	8200 Morgans Way	
<b>WAKE</b>	Bay Leaf #3	1431 Lynn Rd	
<b>WAKE</b>	RFD #9	4465 Six Forks Rd	
<b>WAKE</b>	RFD #4	121 Northway Ct	
<b>WAKE</b>	RFD #11	2925 Glenridge Rd	
<b>WAKE</b>	Wake-New Hope #1	4615 St. James Church Rd	
<b>WAKE</b>	RFD #19	4209 Spring Forest Rd	
<b>WAKE</b>	Swift Creek	6000 Holly Springs Rd	
<b>WAKE</b>	Cary #3	1807 Kildaire Farm Rd	
<b>WAKE</b>	RFD #15	1815 Spring Forest Rd	
<b>WAKE</b>	RFD #16	5225 Lead Mine Rd	
<b>WAKE</b>	RFD #1	220 S. Dawson St	
<b>WAKE</b>	Garner #3	1695 Timber Dr	
<b>WAKE</b>	RFD #21	2651 Southall Rd	
<b>WAKE</b>	RFD #22	9350 Durant Rd	
<b>WAKE</b>	Morrisville #2	10632 Chapel Hill Rd	
<b>WAKE</b>	Cary #6	3609 Ten Ten Rd	
<b>WAKE</b>	Wake Forest #2	9925 Ligon Mill Rd	
<b>WAKE</b>	RFD #24	10440 Fossil Creek Ct	
<b>WAKE</b>	RFD #25	2740 Wakefield Crossing	
<b>WAKE</b>	Fuquay-Varina #3	2474 Bud Lipscomb Rd	
<b>WAKE</b>	Knightdale Pub Safety #2	306 Robertson Rd	
<b>WAKE</b>	RFD #26	3929 Barwell Rd	
<b>WAKE</b>	Holly Springs #1	700 Flint Point Ln	
<b>WAKE</b>	Holly Springs #2	1140 Avent Ferry Rd	
<b>WAKE</b>	KNIGHTDALE PUB SAFETY #1	967 STEEPLE SQUARE CT	
<b>WAKE</b>	Cary #7	6900 Carpenter Fire Station Rd	
<b>WAKE</b>	Wake Forest #3	1412 Forestville Rd	
<b>WAKE</b>	Holly Springs #3	4104 FRIENDSHIP RD	
<b>WAKE</b>	Garner #4	125 Spaceway Ct	
<b>WAKE</b>	RFD #29	12117 Leesville Rd	
<b>DURHAM</b>	DCO 85	4200 FARRINGTON RD	
<b>DURHAM</b>	DFD 4	1818 RIDDLE RD	
<b>DURHAM</b>	DFD 5	2212 CHAPEL HILL RD	
<b>DURHAM</b>	DFD 7	3919 N DUKE ST	
<b>DURHAM</b>	DFD 13	2901 S MIAMI BVD	
<b>DURHAM</b>	DFD 15	2060 TORREDGE RD	
<b>DURHAM</b>	New Hope	4012 WHITFIELD RD	
<b>DURHAM</b>	Chapel Hill 2	1003 S HAMILTON RD	
<b>DURHAM</b>	DFD 2	1001 NINTH ST	
<b>DURHAM</b>	DFD 8	225 LICK CREEK LN	

<b>DURHAM</b>	Morrisville 2	10632 CHAPEL HILL RD	
<b>DURHAM</b>	DCO 84	7305 LEESVILLE RD	
<b>DURHAM</b>	DCO 81	4716 OLD PAGE RD	
<b>DURHAM</b>	Redwood 1	4901 CHEEK RD	
<b>DURHAM</b>	DFD 6	3700 SWARTHMORE DR	
<b>DURHAM</b>	DFD 11	2800 W CORNWALLIS RD	
<b>DURHAM</b>	DCO 83	1409 SEATON RD	
<b>DURHAM</b>	DFD 3	822 N MIAMI BL	
<b>DURHAM</b>	Lebanon 1	7900 RUSSELL RD	
<b>DURHAM</b>	DFD 16	6303 FARRINGTON RD	
<b>DURHAM</b>	Raleigh 24	10440 FOSSIL CREEK CT	
<b>DURHAM</b>	DCO 82	1724 S MIAMI BLVD	
<b>DURHAM</b>	DFD 1	139 E MORGAN ST	
<b>DURHAM</b>	DFD 10	1805 COLEMILL RD	
<b>DURHAM</b>	DFD 12	1230 CARPENTER FLETCHER RD	
<b>DURHAM</b>	DFD 14	1327 UMSTEAD RD	
<b>DURHAM</b>	DFD 9	2012 E CLUB BL	
<b>DURHAM</b>	Bahama 1	1814 BAHAMA RD	
<b>DURHAM</b>	Chapel Hill 3	1615 E FRANKLIN ST	
<b>MECKLENBURG</b>	DAVIDSON VFD	216 S MAIN ST	
<b>MECKLENBURG</b>	HUNTERSVILLE VFD #2	15600 BEATTIES FORD RD	
<b>MECKLENBURG</b>	HUNTERSVILLE VFD #1	110 S OLD STATESVILLE RD	
<b>MECKLENBURG</b>	CAROLINA VFD	9937 PROVIDENCE RD	
<b>MECKLENBURG</b>	HUNTERSVILLE VFD #3	13423 EASTFIELD RD	
<b>MECKLENBURG</b>	FIRE STATION 13	4337 Glenwood Dr	
<b>MECKLENBURG</b>	FIRE STATION 20	9400 Nations Ford Rd	
<b>MECKLENBURG</b>	FIRE STATION 30	4707 Belle-Oaks Dr	
<b>MECKLENBURG</b>	FIRE STATION 26	9231 S Tryon St	
<b>MECKLENBURG</b>	FIRE STATION 21	1023 Little Rock Rd	
<b>MECKLENBURG</b>	FIRE STATION 17	5308 Morris Field Dr	
<b>MECKLENBURG</b>	FIRE STATION 3	6512 Monroe Rd	
<b>MECKLENBURG</b>	FIRE STATION 9	4529 McKee Rd	
<b>MECKLENBURG</b>	FIRE STATION 19	1016 Sardis Ln	
<b>MECKLENBURG</b>	FIRE STATION 14	114 N Sharon Amity Rd	
<b>MECKLENBURG</b>	FIRE STATION 29	2121 Margaret Wallace Rd	
<b>MECKLENBURG</b>	FIRE STATION 27	111 Ken Hoffman Dr	
<b>MECKLENBURG</b>	FIRE STATION 11	620 W 28th St	
<b>MECKLENBURG</b>	FIRE STATION 7	3210 N Davidson St	
<b>MECKLENBURG</b>	FIRE STATION 8	1201 The Plaza	
<b>MECKLENBURG</b>	FIRE STATION 6	249 S Laurel Av	
<b>MECKLENBURG</b>	FIRE STATION 5	224 Wesley Heights Wy	
<b>MECKLENBURG</b>	FIRE STATION 4	525 N Church St	

<b>MECKLENBURG</b>	FIRE STATION 18	2337 Keller Av	
<b>MECKLENBURG</b>	FIRE STATION 15	3617 Frontenac Av	
<b>MECKLENBURG</b>	FIRE STATION 22	1917 W Sugar Creek Rd	
<b>MECKLENBURG</b>	FIRE STATION 1	221 N Myers St	
<b>MECKLENBURG</b>	FIRE STATION 23	7400 E W T Harris Bv	
<b>MECKLENBURG</b>	FIRE STATION 28	8031 Old Statesville Rd	
<b>MECKLENBURG</b>	FIRE STATION 16	6623 Park South Dr	
<b>MECKLENBURG</b>	FIRE STATION 12	420 Inwood Dr	
<b>MECKLENBURG</b>	FIRE STATION 2	1817 South Bv	
<b>MECKLENBURG</b>	FIRE STATION 24	7132 Pineville-Matthews Rd	
<b>MECKLENBURG</b>	FIRE STATION 31	3820 Ridge Rd	
<b>MECKLENBURG</b>	FIRE STATION 33	2001 Mt Holly-Huntersville Rd	
<b>MECKLENBURG</b>	FIRE STATION 34	2824 Rocky River Rd	
<b>MECKLENBURG</b>	FIRE STATION 35	1120 Pavilion Bv	
<b>MECKLENBURG</b>	FIRE STATION 32	9225 Bryant Farms Rd	
<b>MECKLENBURG</b>	FIRE STATION 25	6741 Pleasant Grove Rd	
<b>MECKLENBURG</b>	FIRE STATION 36	2325 W Mallard Creek Church Rd	
<b>MECKLENBURG</b>	FIRE STATION 10	2810 Wilkinson Bv	
<b>MECKLENBURG</b>	FIRE STATION 37	13828 S Tryon St	
<b>MECKLENBURG</b>	FIRE STATION 38	12100 Shopton Rd West	
<b>MECKLENBURG</b>	FIRE STATION 39	8325 Providence Rd	
<b>MECKLENBURG</b>	FIRE STATION 40	9720 Harrisburg Rd	
<b>MECKLENBURG</b>	FIRE STATION 42 (UC)	5620 Central Av	
<b>MECKLENBURG</b>	FIRE STATION 41	5740 West Bv	

Figure S1. Map of Durham county with fire stations, simulated out-of-hospital cardiac arrests (randomly generated points), and nearest driving distance routes.

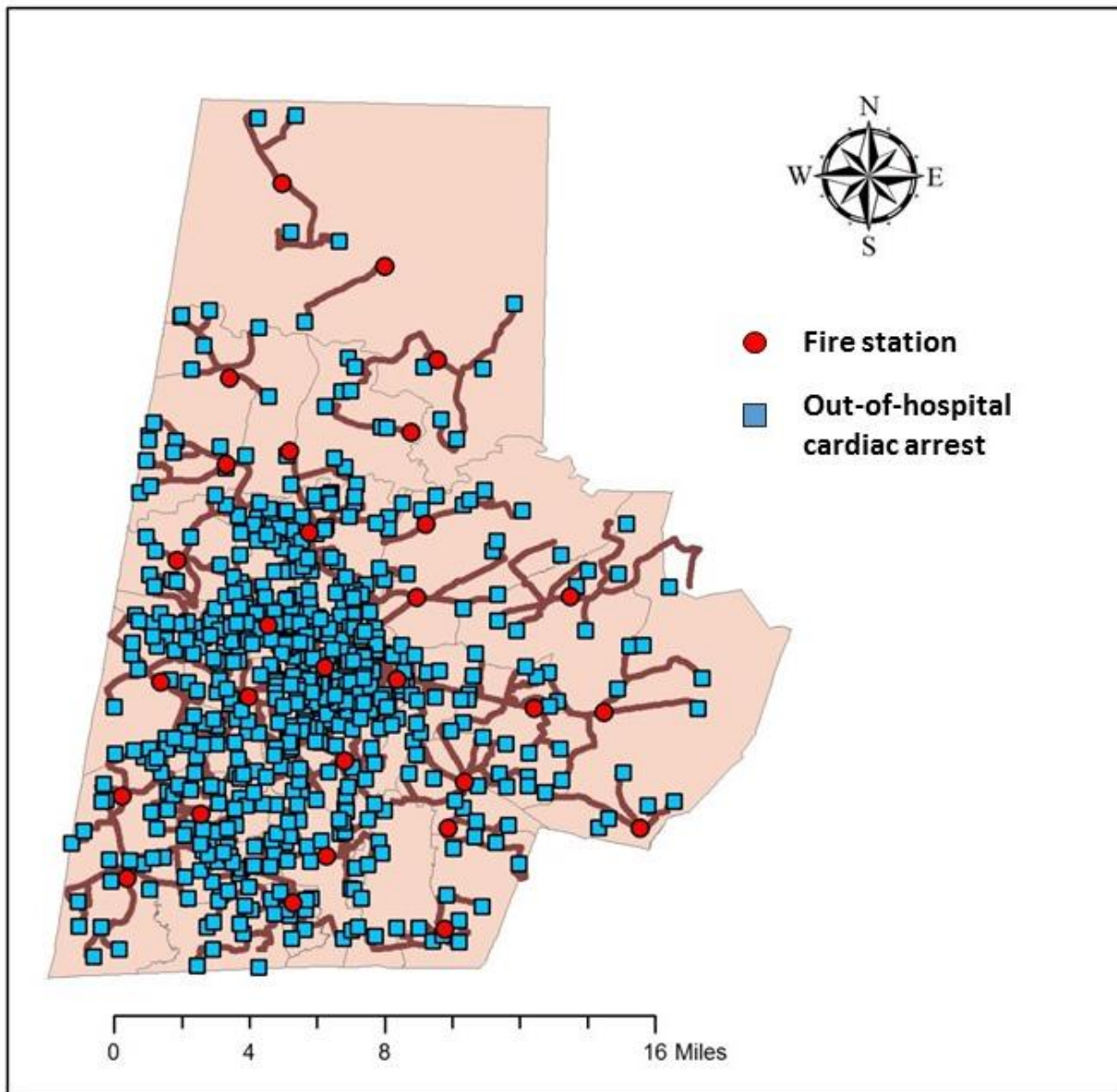
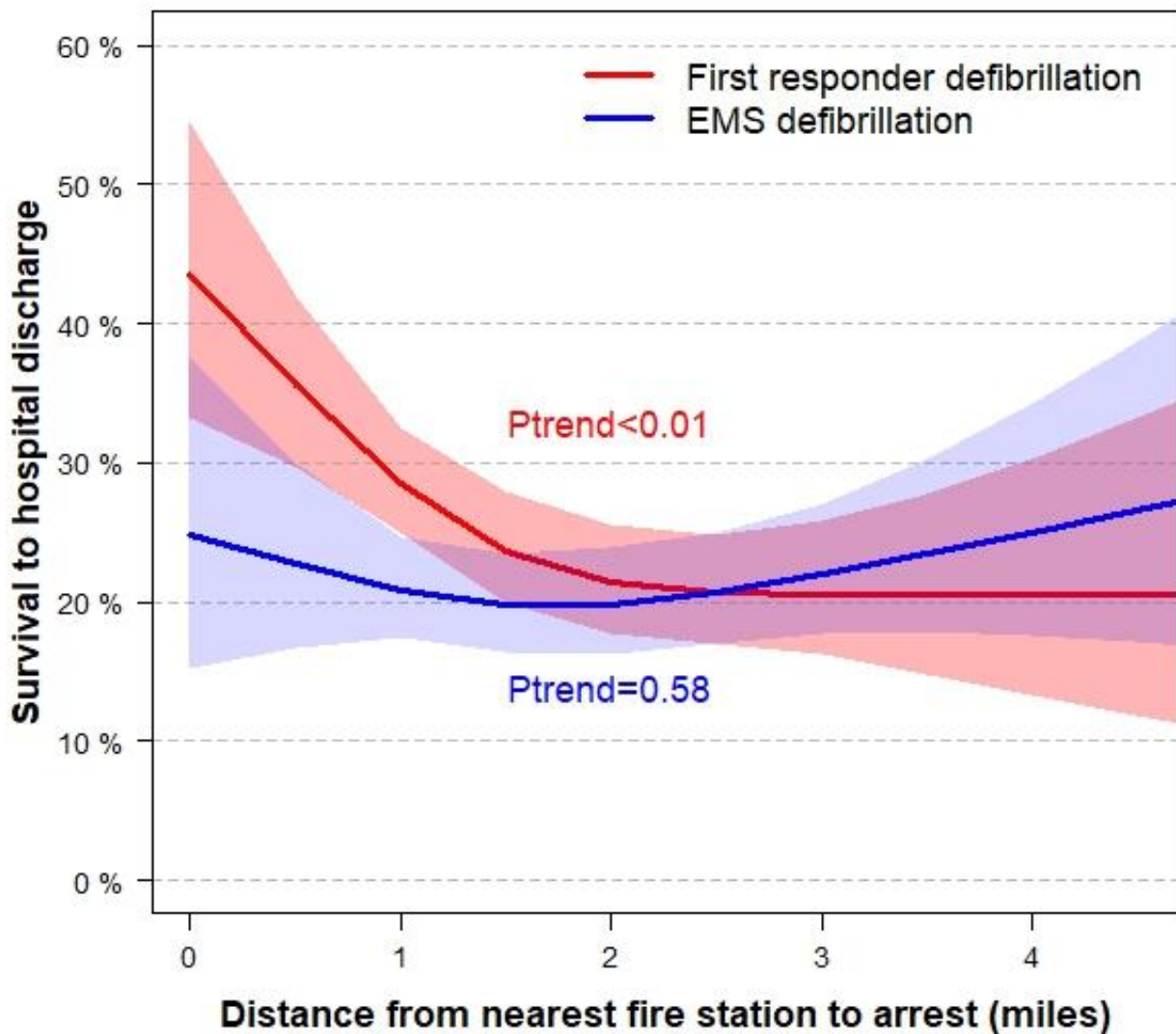
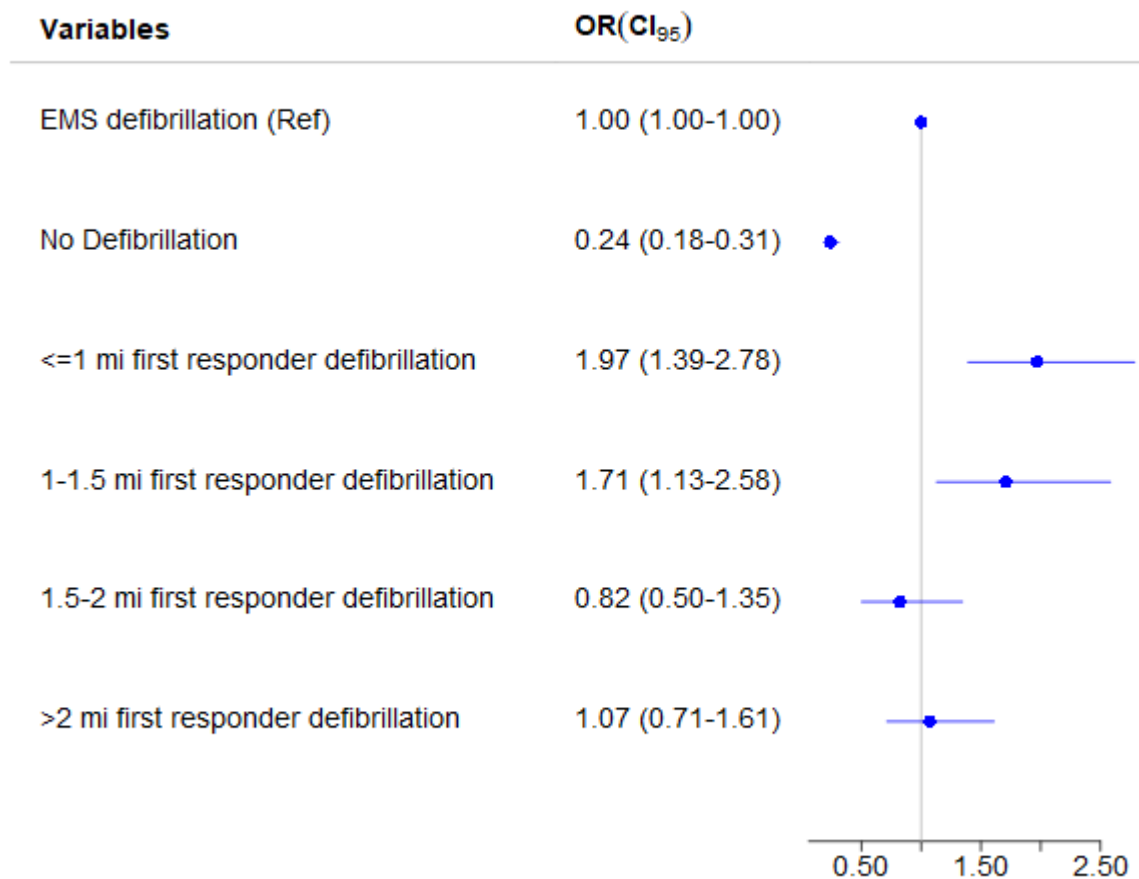


Figure S2. Out-of-hospital cardiac arrest survival to hospital discharge at different driving distances from fire stations according to whether the patient was defibrillated by first responders or EMS.



Survival to hospital discharge following first-responder (n=776) or emergency medical services (EMS) (n=725) personnel defibrillation at different driving distances from nearest fire station to the OHCA site. Logistic regression with restricted cubic splines (knots at 10<sup>th</sup>, 50<sup>th</sup>, and 90<sup>th</sup> percentiles) was used to make the model.

**Figure S3. Imputation analysis: Out-of-hospital cardiac arrest survival following first responder defibrillation at different driving distances from fire stations to OHCA sites compared with EMS defibrillation.**

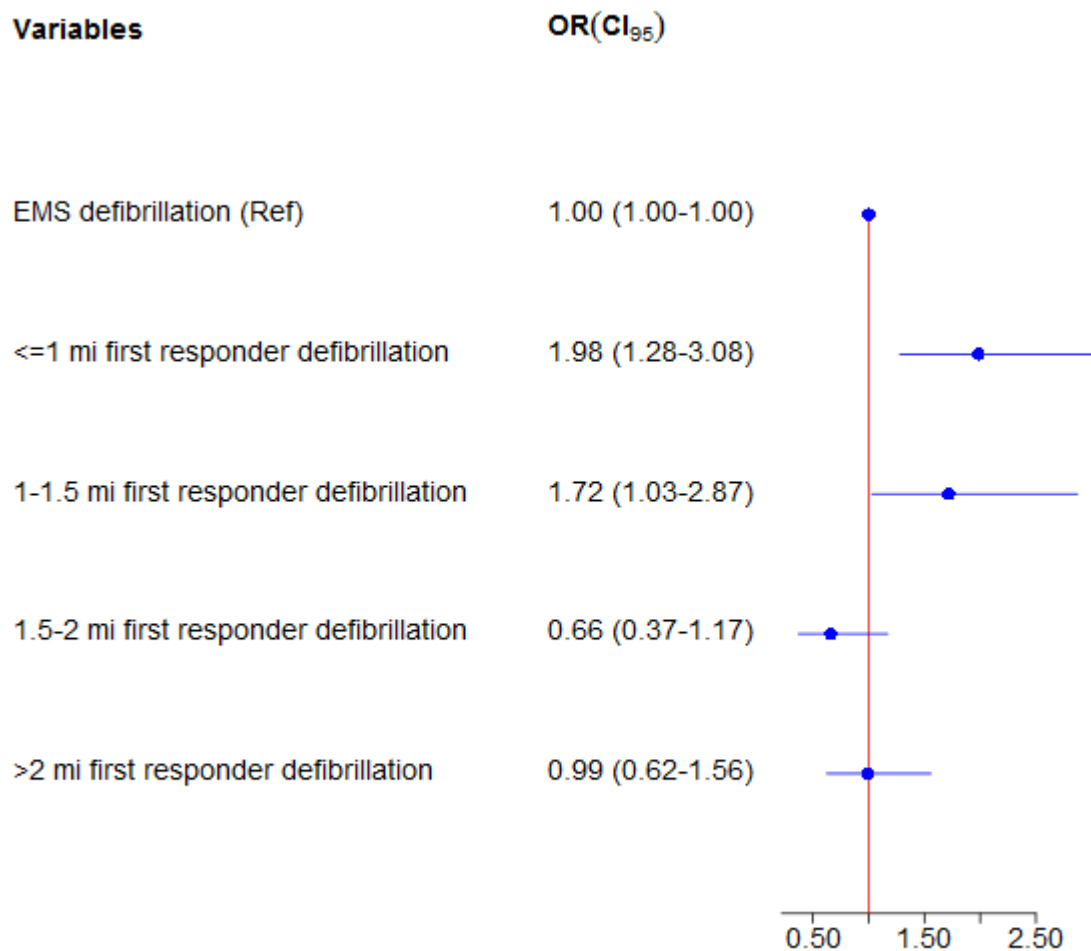


Results of a sensitivity analysis using multiple imputation with 100 imputed datasets for handling missing EMS response times. Odds ratios of survival to discharge after out-of-hospital cardiac arrest are shown for patients defibrillated by first responders within 1 mile, 1-1.5 miles, 1.5-2 miles, and above 2 miles compared with defibrillation by emergency medical services personnel.

\* Adjusted for age, sex, layperson CPR, location of arrest, year of arrest, neighborhood characteristics (unemployment rate, poverty rate, and percentage of white or other races), and response time.



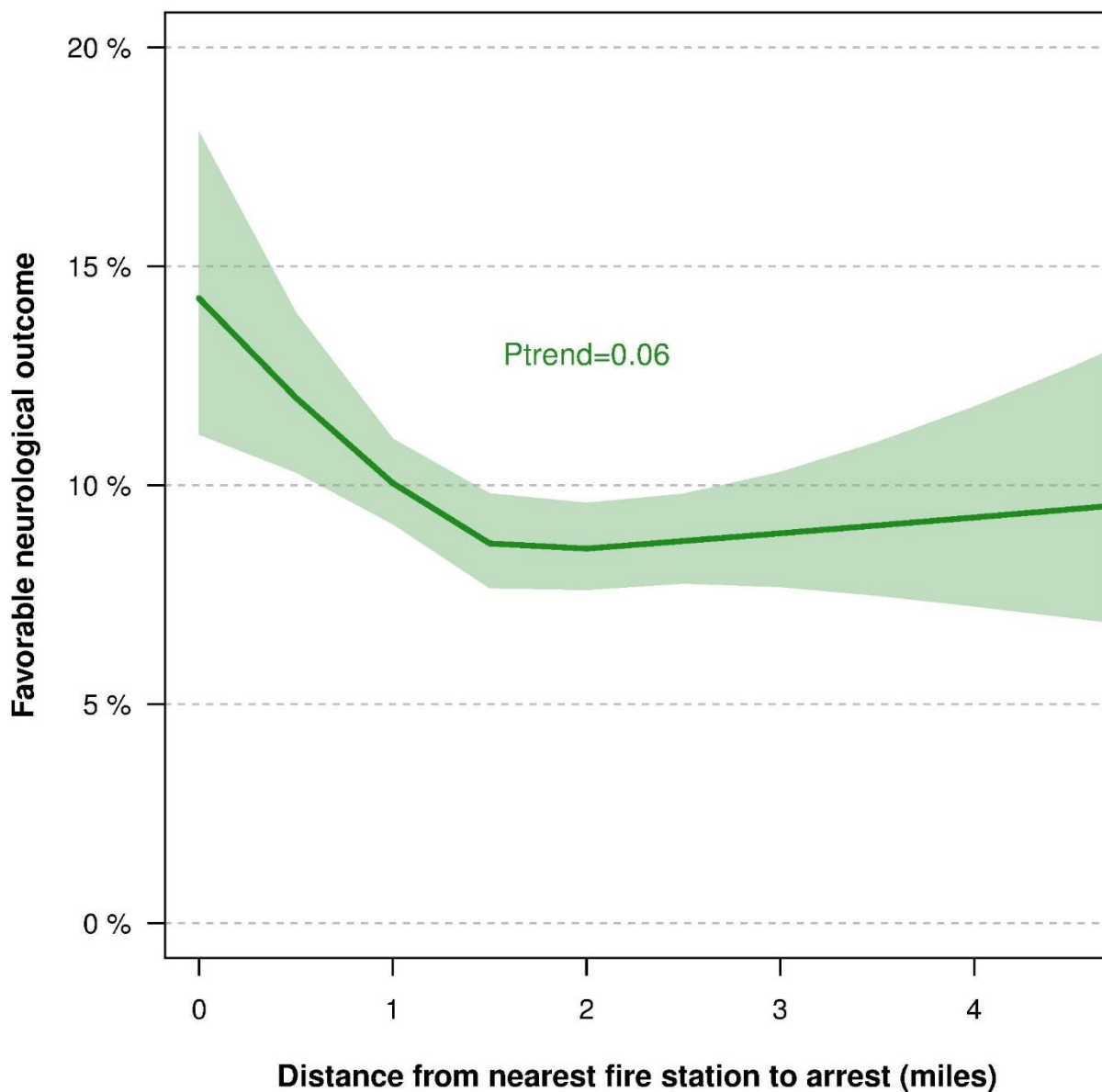
**Figure S4. Out-of-hospital cardiac arrest survival following first responder defibrillation at different driving distances from fire stations to OHCA sites compared with EMS defibrillation for patients with witnessed arrest and a shockable heart rhythm.**



Odds ratios of survival to discharge after out-of-hospital cardiac arrest for patients defibrillated by first responders (n=398) within 1 mile, 1-1.5 miles, 1.5-2 miles, and above 2 miles compared with defibrillation by emergency medical services personnel (reference, n=327).

\* Adjusted for age, sex, layperson CPR, location of arrest, year of arrest, and neighborhood characteristics (unemployment rate, poverty rate, and percentage of white or other races).

Figure S5. Overall out-of-hospital cardiac arrest favorable neurological outcome at different driving distances from fire stations to OHCA sites.



Overall favorable neurological outcome for all patients (n=5,020) at hospital discharge according to driving distance from nearest fire station to OHCA site. Logistic regression with restricted cubic splines (knots at 1 mile, 1.5 miles, and 2 miles) was used to make the model.