

Supplementary Materials for

Responding to Media Inquiries About Earthquake Triggering Interactions

Fang Fan¹, Lingling Ye^{1,2,*}, Hiroo Kanamori³ and Thorne Lay⁴

¹ *Guangdong Provincial Key Lab of Geodynamics and Geohazards, School of Earth Sciences and Engineering, Sun Yat-sen University, Guangzhou, China.*

² *Department of Earth and Space Sciences, Southern University of Science and Technology, Shenzhen, Guangdong, 518055, China.*

³ *Seismological Laboratory, California Institute of Technology, Pasadena, California 91125, USA.*

⁴ *Department of Earth and Planetary Sciences, University of California Santa Cruz, Santa Cruz, California 95064, USA.*

*Corresponding author: Lingling Ye (yell@sustech.edu.cn)

There are three parts in the supplementary material:

- 1) This supporting file provides additional 3 figures and 1 table to support the discussions in the main text and the print version of Fortran codes for “foreshock-mainshock” searching and randomization which help understand the data processing in the main text.
- 2) Electronic supplement: A package of scripts to search and plot foreshock-mainshock pairs, along with necessary databases, which can be downloaded from the following link:
https://www.dropbox.com/s/3u5h81851p2ta2f/FYKL_searching_scripts.zip?dl=0
Fortran code on the searching procedure for the M6.0+ foreshock-mainshock pairs is provided as a PDF file.
- 3) PDF files for sequence plots of all M6.0+ mainshocks preceded by an M6.0+ events in 10 and 21 days within the distances of 50 km, 100 km, 330 km and 1000 km, respectively. They can be downloaded from the following link:
https://www.dropbox.com/s/cy530eq1zffibsu/Search_M6.0_M6.0_sequences.zip?dl=0

Table S1. Searched Aftershocks with given magnitude M_{ET}

M_{ET}	$N_{af}(30)^*$	$N_{af}(30)/N_{total}$	$N_{af}(60)^*$	$N_{af}(60)/N_{total}$
6.0	316	0.19	349	0.21
6.1	237	0.18	270	0.21
6.2	157	0.16	175	0.18
6.3	125	0.15	148	0.18
6.4	94	0.15	101	0.16
6.5	80	0.16	88	0.18
6.6	59	0.15	67	0.17
6.7	37	0.11	46	0.14
6.8	27	0.11	31	0.12
6.9	10	0.05	15	0.07
7.0	23	0.08	26	0.09
7.1	17	0.08	18	0.09
7.2	9	0.05	13	0.08
7.3	8	0.07	9	0.07
7.4	8	0.09	8	0.09
7.5	1	0.01	1	0.01
7.6	3	0.04	3	0.04
7.7	7	0.10	8	0.12
7.8	7	0.11	7	0.11
7.9	4	0.13	4	0.13
8.0	0	0.00	0	0.00
8.0	0	0.00	1	0.05
8.2	1	0.08	1	0.08

* Time windows of 30 days ($N_{af}(30)$) and 60 days ($N_{af}(60)$) after large events and a spherical distance window with radius R (in km) equal to twice the empirical rupture length from Wells & Coppersmith (1994), i.e., $R=2 \times 10^{-2.44+0.59M_w} + 20$ are used to screen aftershocks with given magnitude M_{ET} . For target events with magnitude $M_{ET} < 7.0$, the USGS-NEIC catalog from 01/01/1965 to 11/02/2020 is used, whereas for $M_{ET} \geq 7$, the USGS-NEIC catalog from 01/01/1920 to 11/02/2020 is used.

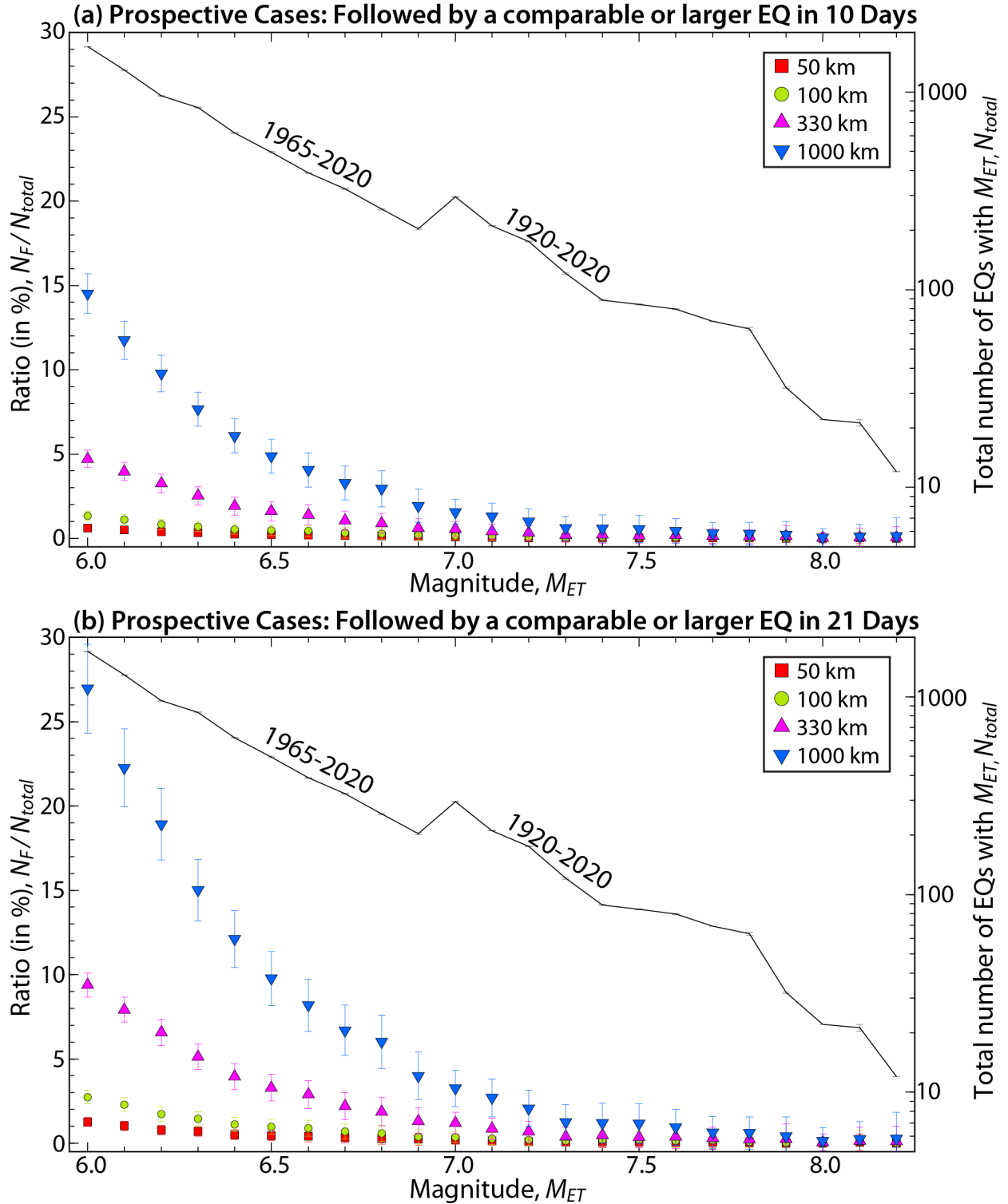


Figure S1. Average prospective occurrence percentages from 9999 temporally randomized catalogs. For each realization, the origin time of every M6.0+ earthquake in the USGS-NEIC catalog since 1900 is perturbed in the time window of 2.5 years before to 2.5 years after its actual origin time with a precision of one second. Error bars indicating one standard deviation. Other symbols are the same as in Figure 1.

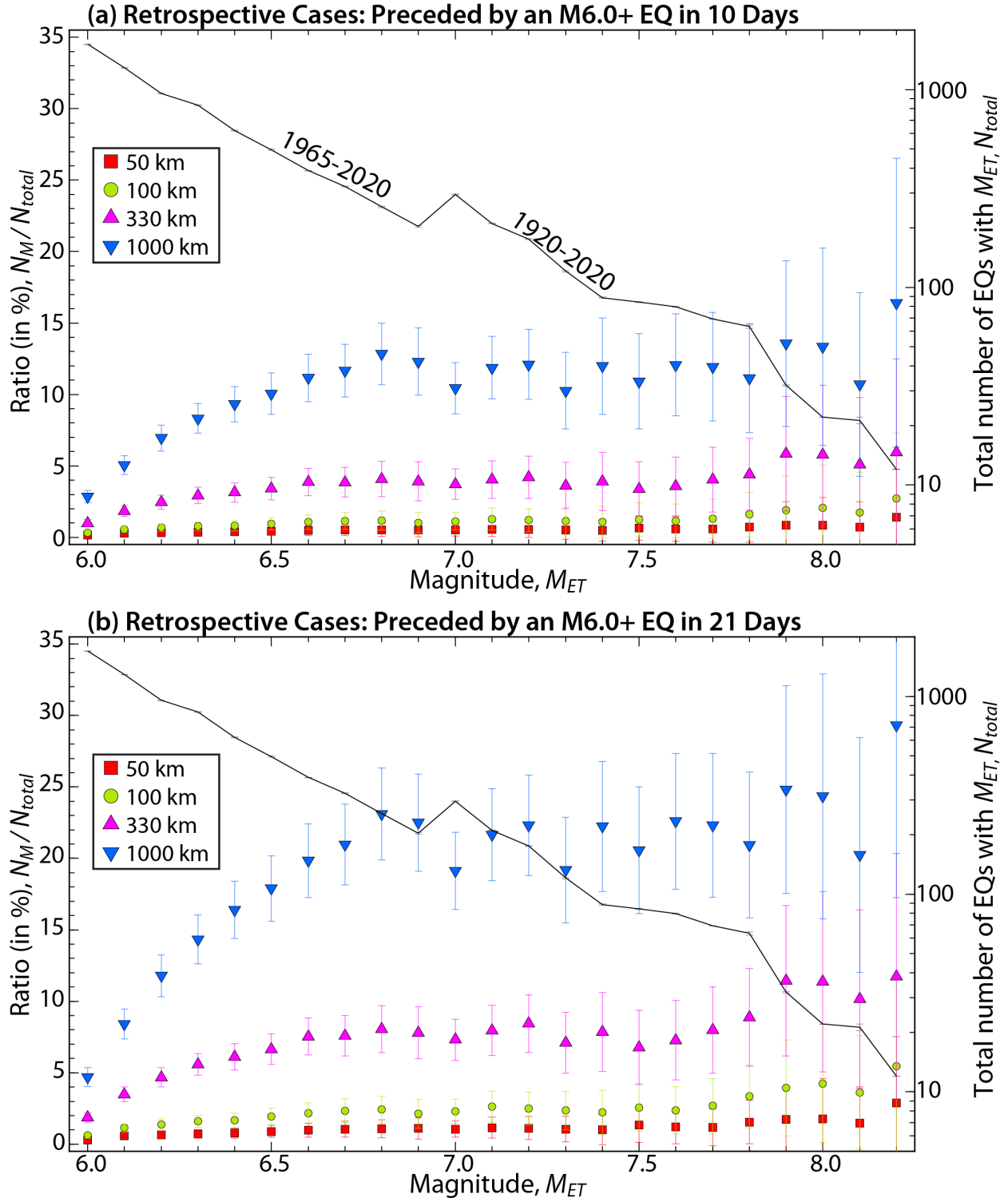


Figure S2. Average retrospective occurrence percentages from 9999 temporally randomized catalogs. For each realization, the origin time of every M6.0+ earthquake in the USGS-NEIC catalog since 1900 is perturbed in the time window of 2.5 years before to 2.5 years after its actual origin time with a precision of one second. Error bars indicating one standard deviation. Other symbols are the same as in Figure 1.

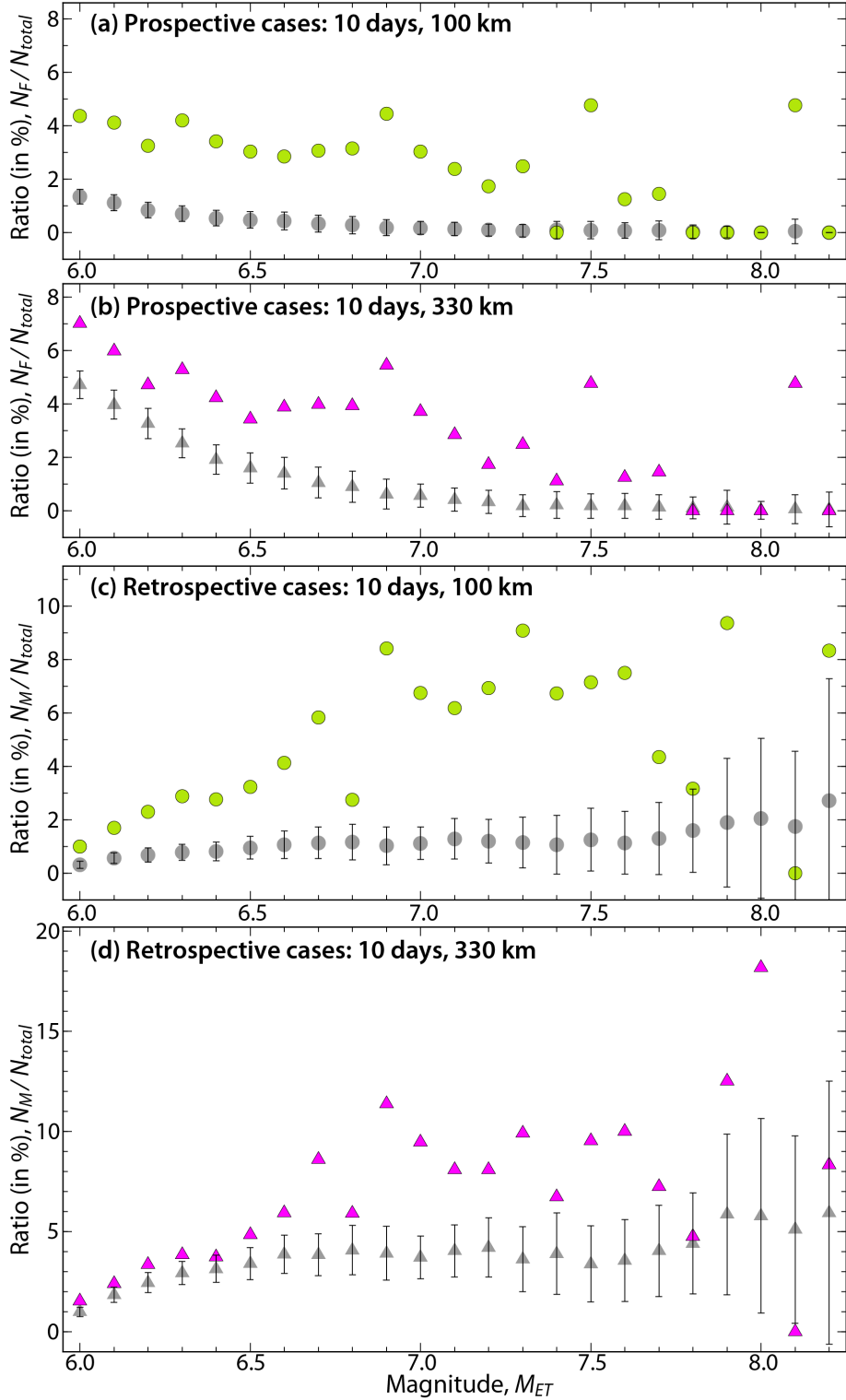


Figure S3. Comparison of prospective (a-b) and retrospective (c-d) occurrence percentages with values from temporally randomized catalogs within radial distances of 100 km (a & c) and 330 km (b & d). Colored symbols indicate percentage for foreshock-mainshock pairs within 10 days from the USGS-NEIC catalog, while gray ones indicate corresponding average values from 9999 temporally randomized catalogs.