Supplementary materials

Sex, environment, and death rate in a dementia cohort: a seven-years Bayesian survival analysis using medications data from a contaminated area in Italy

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Mixed effects INLA binary logistic regressions	Anti-dementia drugs cohort, women			
	Memantine medication		AChEIs medication	
	N = 5,026; n = 2,757		N = 5,026; n = 2,742	
Fixed effects	**OR**	**95% CrI**	**OR**	**95% CrI**
Residence in SIN				
Extra-SIN	1.00	(ref)	1.00	(ref)
SIN	0.25	0.14-0.42	3.41	1.99-5.88
Age (years)				
40-59	1.00	(ref)	1.00	(ref)
60-69	0.75	0.19-3.02	0.42	0.10-1.73
70-79	2.03	0.50-8.20	0.09	0.02-0.38
≥ 80	5.54	1.36-22.82	0.03	0.01-0.15
Disease duration (years)				
0	1.00	(ref)	1.00	(ref)
1	4.37	3.09-6.18	0.88	0.64-1.20
2-3	11.99	7.92-18.05	0.39	0.27-0.55
4-6	19.41	10.51-35.93	0.15	0.08-0.27
Treatment year(s)				
2015-19	1.00	(ref)	1.00	(ref)
2020	2.11	1.39-3.21	0.45	0.31-0.67
2021	2.56	1.62-4.05	0.44	0.28-0.67

Table S1. Results of mixed effects Bayesian INLA binary logistic regressions models in the anti-dementia drugs cohort of women, mutually adjusted and adjusted for patient ID and municipality of residence. Province of Taranto, 2015-21, follow-up to 31/12/2021. Outcome (prevalence): therapy. N: prevalent cases and non-cases. n: prevalent cases.

Mixed effects INLA binary logistic regressions	Anti-dementia drugs cohort, men			
	Memantine medication		AChEIs medication	
	N = 3,113; n = 1,794		N = 3,113; n = 1,626	
Fixed effects	**OR**	**95% CrI**	**OR**	**95% CrI**
Residence in SIN				
Extra-SIN	1.00	(ref)	1.00	(ref)
SIN	0.75	0.08-6.75	2.04	1.04-4.05
Age (years)				
40-59	1.00	(ref)	1.00	(ref)
60-69	0.21	0.04-1.14	5.98	1.10-32.98
70-79	1.89	0.37-9.62	0.36	0.07-1.81
≥ 80	3.04	0.59-15.87	0.25	0.05-1.31
Disease duration (years)				
0	1.00	(ref)	1.00	(ref)
1	4.37	2.81-7.05	1.15	0.78-1.71
2-3	12.38	7.27-22.44	0.46	0.29-0.72
4-6	16.74	7.34-40.18	0.35	0.16-0.73
Treatment year(s)				
2015-19	1.00	(ref)	1.00	(ref)
2020	1.76	1.05-2.96	0.62	0.38-1.02
2021	2.48	1.38-4.47	0.56	0.32-0.97

Table S2. Results of mixed effects Bayesian INLA binary logistic regressions models in the anti-dementia drugs cohort of men, mutually adjusted and adjusted for patient ID and municipality of residence. Province of Taranto, 2015-21, follow-up to 31/12/2021. Outcome (prevalence): therapy. N: prevalent cases and non-cases. n: prevalent cases.

Mixed effects INLA binary logistic regressions	Anti-dementia drugs cohort, extra-SIN			
	Memantine medication		*AChEIs medication*	
	N = 4,647; n = 2,733		*N = 4,647; n = 2,335*	
Fixed effects	**OR**	**95% CrI**	**OR**	**95% CrI**
Sex				
Women	1.00	(ref)	1.00	(ref)
Men	1.03	0.59-1.78	0.84	0.48-1.46
Age (years)				
40-59	1.00	(ref)	1.00	(ref)
60-69	0.76	0.18-3.29	0.32	0.07-1.57
70-79	3.71	0.85-16.15	0.04	0.01-0.19
≥ 80	12.96	2.92-58.24	0.01	0.00-0.05
Disease duration (years)				
0	1.00	(ref)	1.00	(ref)
1	3.88	2.73-5.61	1.05	0.76-1.46
2-3	12.29	8.03-19.49	0.37	0.25-0.54
4-6	20.91	10.85-41.41	0.12	0.06-0.22
Treatment year(s)				
2015-19	1.00	(ref)	1.00	(ref)
2020	1.59	1.05-2.42	0.60	0.40-0.90
2021	1.96	1.23-3.14	0.63	0.40-0.99

Table S3. Results of mixed effects Bayesian INLA binary logistic regressions models in the anti-dementia drugs cohort of residents in extra-SIN municipalities, mutually adjusted and adjusted for patient ID and municipality of residence. Province of Taranto, 2015-21, follow-up to 31/12/2021. Outcome (prevalence): therapy. N: prevalent cases and non-cases. n: prevalent cases.

Mixed effects INLA binary logistic regressions	Anti-dementia drugs cohort, SIN			
	Memantine medication		AChEIs medication	
	N = 3,492; n = 1,818		N = 3,492; n = 2,033	
Fixed effects	**OR**	**95% CrI**	**OR**	**95% CrI**
Sex				
Women	1.00	(ref)	1.00	(ref)
Men	3.30	1.70-6.53	0.45	0.24-0.85
Age (years)				
40-59	1.00	(ref)	1.00	(ref)
60-69	0.40	0.09-1.85	2.60	0.61-11.18
70-79	1.14	0.26-5.07	0.52	0.12-2.14
≥ 80	1.55	0.35-6.99	0.46	0.11-1.93
Disease duration (years)				
0	1.00	(ref)	1.00	(ref)
1	5.01	3.26-7.82	0.91	0.62-1.31
2-3	11.57	7.03-19.5	0.51	0.34-0.78
4-6	14.47	6.90-31.19	0.41	0.21-0.78
Treatment year(s)				
2015-19	1.00	(ref)	1.00	(ref)
2020	2.67	1.60-4.45	0.39	0.25-0.62
2021	3.49	2.00-6.14	0.32	0.19-0.53

Table S4. Results of mixed effects Bayesian INLA binary logistic regressions models in the anti-dementia drugs cohort of residents in SIN municipalities, mutually adjusted and adjusted for patient ID and municipality of residence. Province of Taranto, 2015-21, follow-up to 31/12/2021. Outcome (prevalence): therapy. N: prevalent cases and non-cases. n: prevalent cases.

Mixed effects INLA Cox proportional hazard regression	Anti-dementia drugs cohort, women	
	All-cause death	
	N = 5,026; person-years = 4,942; *n* = 175	
Fixed effects	**HR**	**95% CrI**
Residence in SIN		
Extra-SIN	1.00	(ref)
SIN	1.49	1.10-2.01
Age (years)		
40-59	1.00	(ref)
60-69	0.71	0.14-3.52
70-79	1.24	0.30-5.15
≥ 80	3.33	0.82-13.52
Disease duration (years)		
0	1.00	(ref)
1	1.40	0.90-2.18
2-3	1.89	1.27-2.81
4-6	2.12	1.31-3.42
Treatment year(s)		
2015-19	1.00	(ref)
2020	1.54	1.06-2.25
2021	1.33	0.90-1.97
Anti-dementia drug(s)		
Memantine	1.00	(ref)
AChEIs	0.73	0.53-1.01
Combined	0.49	0.26-0.92

Table S5. Results of mixed effects Bayesian INLA Cox proportional hazard regression model in the anti-dementia drugs cohort of women, mutually adjusted and adjusted for patient ID and municipality of residence. Province of Taranto, 2015-21, follow-up to 31/12/2021. Time: days of follow-up. Outcome (incidence): all-cause death. N: incident cases and non-cases. n: incident cases.

Mixed effects INLA Cox proportional hazard regression	Anti-dementia drugs cohort, men	
	All-cause death	
	N = 3,113; person-years = 3,019; n = 212	
Fixed effects	**HR**	**95% CrI**
Residence in SIN		
Extra-SIN	1.00	(ref)
SIN	1.08	0.82-1.41
Age (years)		
40-59	1.00	(ref)
60-69	4.22	0.53-33.58
70-79	8.40	1.18-60.04
≥ 80	15.86	2.23-112.85
Disease duration (years)		
0	1.00	(ref)
1	1.59	1.08-2.36
2-3	1.90	1.32-2.75
4-6	2.33	1.49-3.65
Treatment year(s)		
2015-19	1.00	(ref)
2020	1.24	0.86-1.79
2021	1.75	1.26-2.45
Anti-dementia drug(s)		
Memantine	1.00	(ref)
AChEIs	0.65	0.48-0.88
Combined	0.57	0.34-0.94

Table S6. Results of mixed effects Bayesian INLA Cox proportional hazard regression model in the anti-dementia drugs cohort of men, mutually adjusted and adjusted for patient ID and municipality of residence. Province of Taranto, 2015-21, follow-up to 31/12/2021. Time: days of follow-up. Outcome (incidence): all-cause death. N: incident cases and non-cases. n: incident cases.

Mixed effects INLA Cox proportional hazard regression	Anti-dementia drugs cohort, extra-SIN	
	All-cause death	
	N = 4,647; person-years = 4,556; *n* = 204	
Fixed effects	**HR**	**95% CrI**
Sex		
Women	1.00	(ref)
Men	2.49	1.88-3.29
Age (years)		
40-59	1.00	(ref)
60-69	2.81	0.36-22.07
70-79	5.12	0.71-36.75
≥ 80	9.11	1.27-65.19
Disease duration (years)		
0	1.00	(ref)
1	1.47	0.99-2.19
2-3	1.84	1.28-2.66
4-6	2.13	1.35-3.38
Treatment year(s)		
2015-19	1.00	(ref)
2020	1.35	0.94-1.95
2021	1.65	1.17-2.33
Anti-dementia drug(s)		
Memantine	1.00	(ref)
AChEIs	0.78	0.57-1.05
Combined	0.58	0.33-1.03

Table S7. Results of mixed effects Bayesian INLA Cox proportional hazard regression model in the anti-dementia drugs cohort of residents in extra-SIN municipalities, mutually adjusted and adjusted for patient ID and municipality of residence. Province of Taranto, 2015-21, follow-up to 31/12/2021. Time: days of follow-up. Outcome (incidence): all-cause death. N: incident cases and non-cases. n: incident cases.

Mixed effects INLA Cox proportional hazard regression	Anti-dementia drugs cohort, SIN	
	All-cause death	
	N = 3,492; person-years = 3,405; n = 183	
Fixed effects	**HR**	**95% CrI**
Sex		
Women	1.00	(ref)
Men	1.82	1.36-2.43
Age (years)		
40-59	1.00	(ref)
60-69	1.08	0.21-5.59
70-79	2.35	0.57-9.67
≥ 80	6.52	1.61-26.37
Disease duration (years)		
0	1.00	(ref)
1	1.54	1.00-2.36
2-3	2.01	1.36-2.99
4-6	2.37	1.48-3.81
Treatment year(s)		
2015-19	1.00	(ref)
2020	1.40	0.96-2.04
2021	1.44	0.98-2.10
Anti-dementia drug(s)		
Memantine	1.00	(ref)
AChEIs	0.59	0.43-0.81
Combined	0.48	0.28-0.84

Table S8. Results of mixed effects Bayesian INLA Cox proportional hazard regression model in the anti-dementia drugs cohort of residents in SIN municipalities, mutually adjusted and adjusted for patient ID and municipality of residence. Province of Taranto, 2015-21, follow-up to 31/12/2021. Time: days of follow-up. Outcome (incidence): all-cause death. N: incident cases and non-cases. n: incident cases.