

AMYOTROPHIC LATERAL SCLEROSIS FOLLOWING EXPOSURE TO INORGANIC SELENIUM IN DRINKING WATER

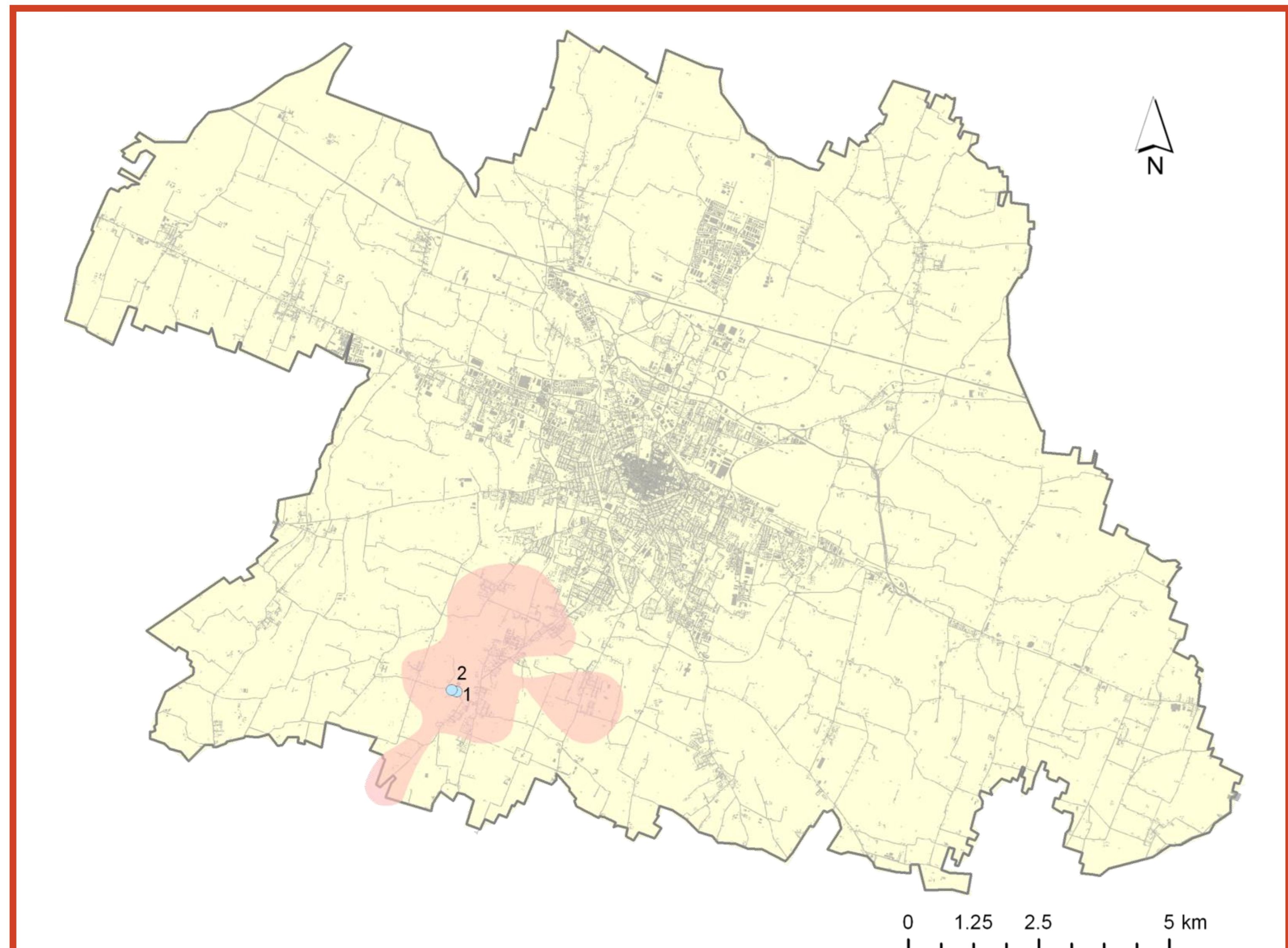
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IN THIS NATURAL EXPERIMENT, EXPOSURE TO INORGANIC HEXAVALENT SELENIUM WAS ASSOCIATED WITH INCREASED ALS RISK

Background

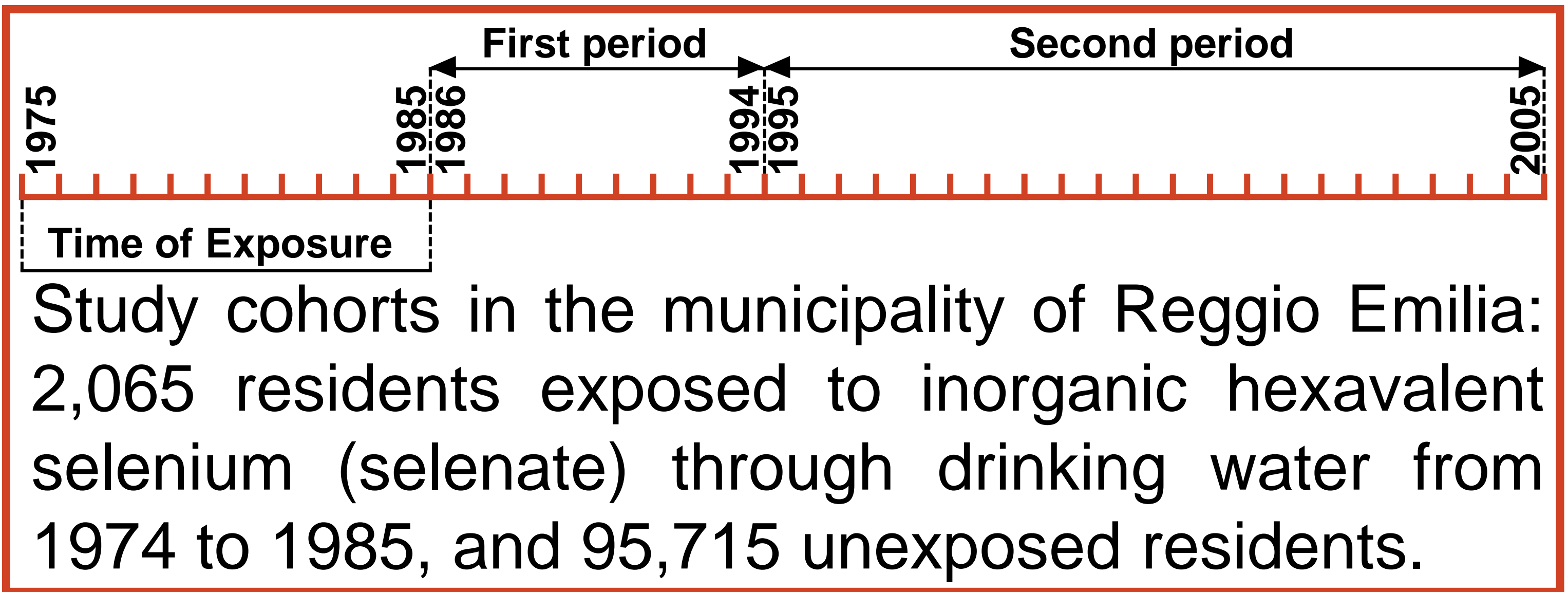
Laboratory and epidemiologic studies indicate an association between high intake of selenium and risk of sporadic amyotrophic lateral sclerosis (ALS).



Reggio Emilia municipality, Northern Italy. Shaded area=residents exposed to municipal tapwater with high inorganic selenium content (~8 µg/L).

Methods

During 1986 through 2015, we used various administrative databases and a population-based registry to identify incident ALS cases. We used Poisson regression to compute incidence rate ratios (RR) adjusting for age, sex, calendar year.



Results

During follow-up, we identified 7 and 112 incident cases of ALS (all sporadic) in the exposed and unexposed cohorts, respectively, with rates of 14 and 5 per 100,000 person-years. We observed stronger associations in the earlier period of follow-up (1986-1994 vs. 1995-2015) and among women.

	Selenium-exposed cohort		Unexposed cohort		Rate ratio	
	Cases/Non cases	Person-years	Cases/Non cases	Person-years	RR	95% CI
All subjects	7/ 2,058	50,100	112/ 95,603	2,233,963	2.8	1.3, 6.0
By sex						
Men	3/ 1,017	24,522	73/ 44,772	1,036,533	1.7	0.5, 5.4
Women	4/ 1,041	25,578	39/ 50,831	1,197,430	4.8	1.8, 14.3
By period						
1985-1994	4/ 2,061	17,561	21/ 95,694	803,347	8.7	2.7, 24.7
1995-2015	3/ 1,831	32,539	91/ 82904	1,430,616	1.4	0.5, 4.7