

Table S1 Deaths and DALYs Burden of Smoking-associated T2DM in Middle-Aged and Elderly Chinese Adults by Different Age Groups, 1990–2021.

Measure	Age Group	1990 number of years (95% UI)	1990 rate (95% UI)	2021 number of years (95% UI)	2021 rate (95% UI)	EAPC (95% CI)	RC of numbers (%)	RC of rate (%)
Deaths	55-59 years	920.409(708.501-1148.574)	2.122(1.634-2.648)	1524.213(1102.187-2112.762)	1.386(1.003-1.922)	-1.35(-1.47, -1.22)	65.6	-34.67
	60-64 years	1055.968(833.468-1348.335)	2.988(2.359-3.816)	1583.263(1138.388-2180.265)	2.169(1.559-2.986)	-0.88(-0.99, -0.76)	49.93	-27.43
	65-69 years	1274.173(995.572-1573.600)	4.670(3.649-5.768)	2731.836(1990.418-3695.330)	3.562(2.595-4.818)	-0.79(-0.96, -0.61)	114.4	-23.74
	70-74 years	1215.898(961.795-1494.252)	6.461(5.111-7.941)	2944.367(2158.969-4027.620)	5.525(4.051-7.557)	-0.38(-0.54, -0.21)	142.16	-14.5
	75-79 years	804.356(612.783-1026.525)	7.068(5.384-9.020)	2461.521(1772.711-3287.665)	7.432(5.353-9.927)	0.51(0.23, 0.78)	206.02	5.16

	80-84 years	375.909(286.890-485.581)	7.096(5.416-9.167)	1594.247(1164.806-2141.590)	8.055(5.885-10.821)	0.62(0.34, 0.91)	324.1	13.51
	85-89 years	189.117(144.669-240.475)	11.211(8.576-14.256)	1257.446(941.777-1650.759)	13.200(9.887-17.329)	0.59(0.19, 0.98)	564.9	17.74
	90-94 years	44.779(33.730-56.563)	14.595(10.993-18.435)	419.087(304.122-566.830)	14.294(10.373-19.333)	- 0.03(-0.25, 0.20)	835.89	- 2.06
	95+ years	4.068(2.869-5.459)	10.047(7.086-13.481)	60.175(41.762-80.687)	9.416(6.534-12.625)	0.34(-0.83, 0.15)	1379.12	- 6.29
D A L Ys	55-59 years	72590.753(55185.315-94929.540)	167.379(127.246-218.887)	193457.321(140182.458-265535.739)	175.962(127.505-241.523)	0.11(0.05, 0.16)	166.5	5.13
	60-64 years	69443.139(53216.364-91297.926)	196.514(150.595-258.360)	148389.838(109413.781-202097.356)	203.259(149.871-276.826)	0.00(-0.05, 0.06)	113.69	3.43
	65-69 years	64875.176(50361.903-84689.853)	237.796(184.599-310.426)	182682.189(134308.118-241066.055)	238.167(175.100-314.283)	- 0.11(-0.20, -0.03)	181.59	0.16
	70-74 years	46225.583(35511.456-59242.829)	245.650(188.714-314.826)	133646.594(99194.337-179838.563)	250.761(186.118-337.431)	0.01(-0.01, -)	189.12	2.08

years					0.07, 0.09)		
75-79 years	23006.568(17493.355-29232.494)	202.154(153.711-256.860)	78269.673(58476.647-104456.492)	236.329(176.566-315.398)	0.60(0.41, 0.78)	240.21	16.91
80-84 years	8230.466(6059.567-10668.319)	155.376(114.393-201.398)	35860.799(26562.281-46805.511)	181.190(134.208-236.489)	0.43(0.22, 0.64)	335.71	16.61
85-89 years	2818.464(2119.924-3625.584)	167.084(125.673-214.932)	18502.645(13839.985-24091.574)	194.238(145.290-252.910)	0.36(0.08, 0.64)	556.48	16.25
90-94 years	521.324(393.031-669.800)	169.911(128.097-218.302)	4969.943(3626.133-6582.368)	169.508(123.675-224.502)	-0.13(-0.33, 0.06)	853.33	-0.24
95+ years	46.692(32.981-62.588)	115.313(81.452-154.569)	684.372(480.236-922.320)	107.084(75.143-144.316)	0.54(-1.00, -0.08)	1365.7	-7.14

Abbreviations: **ASR:** age-standardized rate; **RC:** relative change; **EAPC:** estimated annual percentage change; **SDI:** sociodemographic index; **UI:** uncertainty interval; **CI:** confidence interval.

Note: UIs are for GBD outputs, and CIs are for model-based estimates.

Table S2 Joinpoint Regression Analysis of Smoking - Induced T2DM Deaths and DALYs Burden Rates (per 100,000 Person - Years) Among Middle - aged and Elderly Chinese Adults by Sex, 1990 - 2021.

Gender	Deaths			DALYs		
	period	APC (95% CI)	AAPC (95% CI)	period	APC (95% CI)	AAPC (95% CI)
Both	1990-1996	0.34 (0.04 - 0.64)	-0.19 (-0.37 - 0.00)	1990-1995	1.45 (1.07 - 1.83)	0.18 (-0.10 - 0.45)
	1996-2004	1.64 (1.42 - 1.87)		1995-1998	-0.70 (-2.37 - -1.00)	
	2004-2007	-3.57 (-5.10 - -2.01)		1998-2004	0.32 (-0.04 - 0.69)	
	2007-2016	-0.04 (-0.22 - 0.15)		2004-2007	-1.30 (-2.90 - -0.33)	
	2016-2021	-1.91 (-2.41 - -1.40)		2007-2010	1.03 (-0.65 - 2.74)	
			2010-2021	-0.06 (-0.19 - -0.06)		
Male	1990-1995	-0.27 (-0.74 - 0.19)	0.18 (-0.09 - 0.45)	1990-1995	1.77 (1.50 - 2.03)	0.44 (0.21 - 0.67)
	1995-2004	1.78 (1.57 - 1.98)		1995-2000	-1.40 (-1.74 - -1.07)	
	2004-2007	-2.97 (-4.65 - -1.25)		2000-2004	-0.09 (-0.62 - -0.45)	
	2007-2010	1.63 (-0.17 - 3.46)		2004-2008	-3.87 (-4.39 - -3.35)	

	2010-2016	0.48 (0.01 - 0.95)		2008-2014	-2.87 (-3.12 - -2.61)
	2016-2021	-1.52 (-2.10 - -0.94)		2014-2021	-1.48 (-1.67 - -1.30)
Female	1990-2004	0.89 (0.79 - 0.99)	-1.87 (-2.08 - -1.66)	1990-1993	1.61 (0.83 - 2.39)
	2004-2007	-6.59 (-8.40 - -4.75)		1993-2004	0.24 (0.12 - 0.37)
	2007-2013	-4.51 (-4.93 - -4.09)		2004-2007	-0.52 (-2.01 - -0.98)
	2013-2021	-2.80 (-3.09 - -2.51)		2007-2010	1.64 (0.08 - 3.22)
				2010-2018	0.54 (0.32 - 0.76)
				2018-2021	-0.51 (-1.36 - -0.36)

Abbreviations: AAPC: average annual percent change; APC: annual percent change; CI: confidence interval.

Table S3 Validation of ARIMA's suitability for long-term predictions

Measure	Sex	AIC	BIC	LB p value	RMSE	MAE	MAPE
Deaths		-	-				
	Both	85.72935	78.40067	0.92827	0.24229	0.18939	4.81625
		123	171	7648	845	9851	8085
		-	-				
	Male	58.22512	55.35714	0.60775	0.27379	0.21476	3.04425
		313	872	9098	1009	1679	7318
DAL Ys		-	-				
	Female	124.8608	123.4596	0.46217	0.01569	0.01317	1.30927
		889	915	3476	7462	1983	4523
	Both	119.1248	126.4535	0.29734	3.00357	2.31539	1.07852
		816	612	0289	6429	8397	4072
	Male	145.3680	151.1040	0.83366	4.69541	3.58456	0.92535
	839	328	4539	503	7711	1496	
	Female	60.80003	62.20122	0.20135	2.27435	2.02092	4.35838
		154	892	8752	78	8801	2157

AIC: Akaike Information Criterion, **BIC:** Bayesian Information Criterion, **LB p value:** Ljung-Box Test p-value, **RMSE:** Root Mean Square Error, **MAE:** Mean Absolute Error, **MAPE:** Mean Absolute Percentage Error.

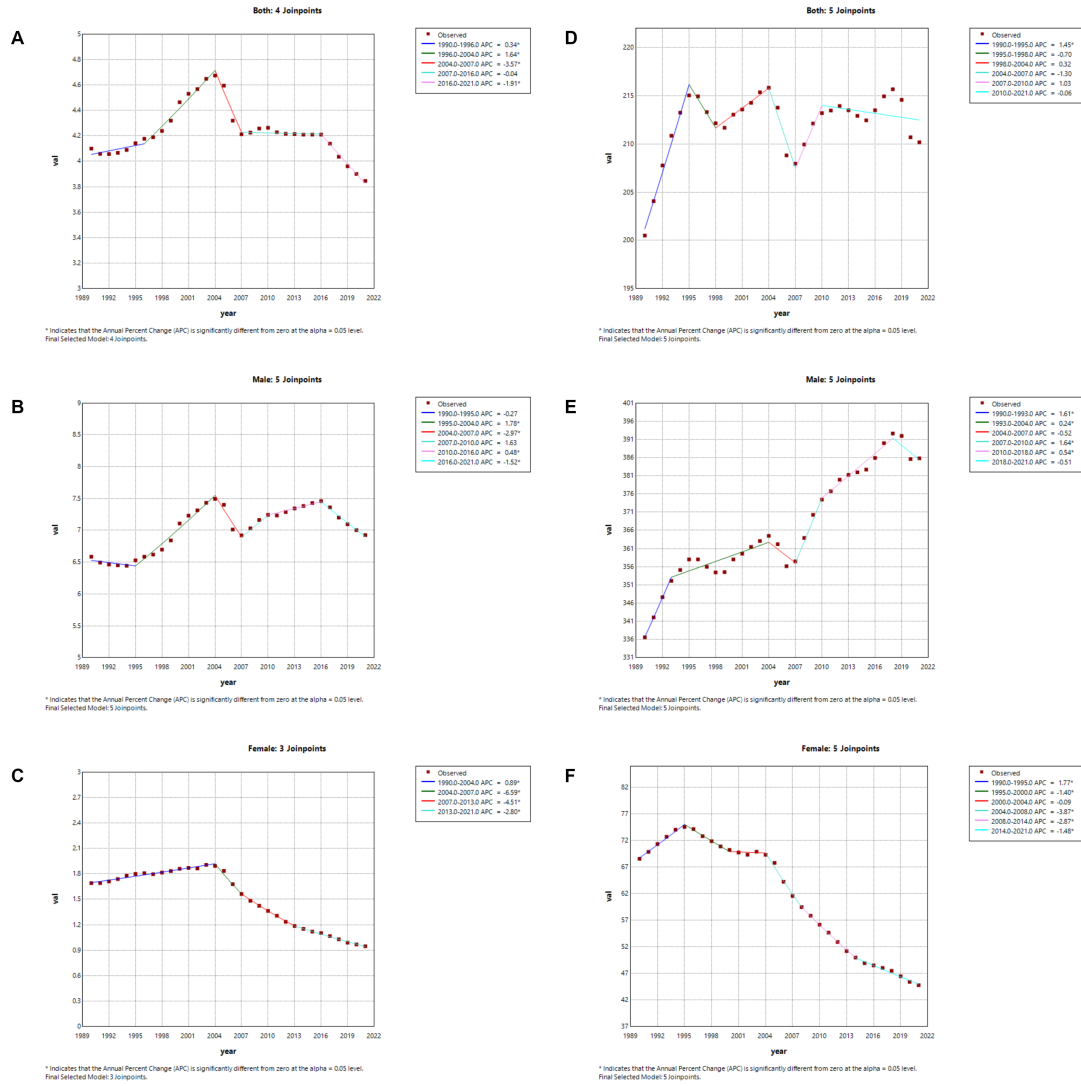


Figure S1 Joinpoint regression analysis of sex-specific age-standardized DALYs rates for smoking-associated T2DM in China: a study spanning 1990 to 2021 (a) both sexes, (b) males, (c) females.

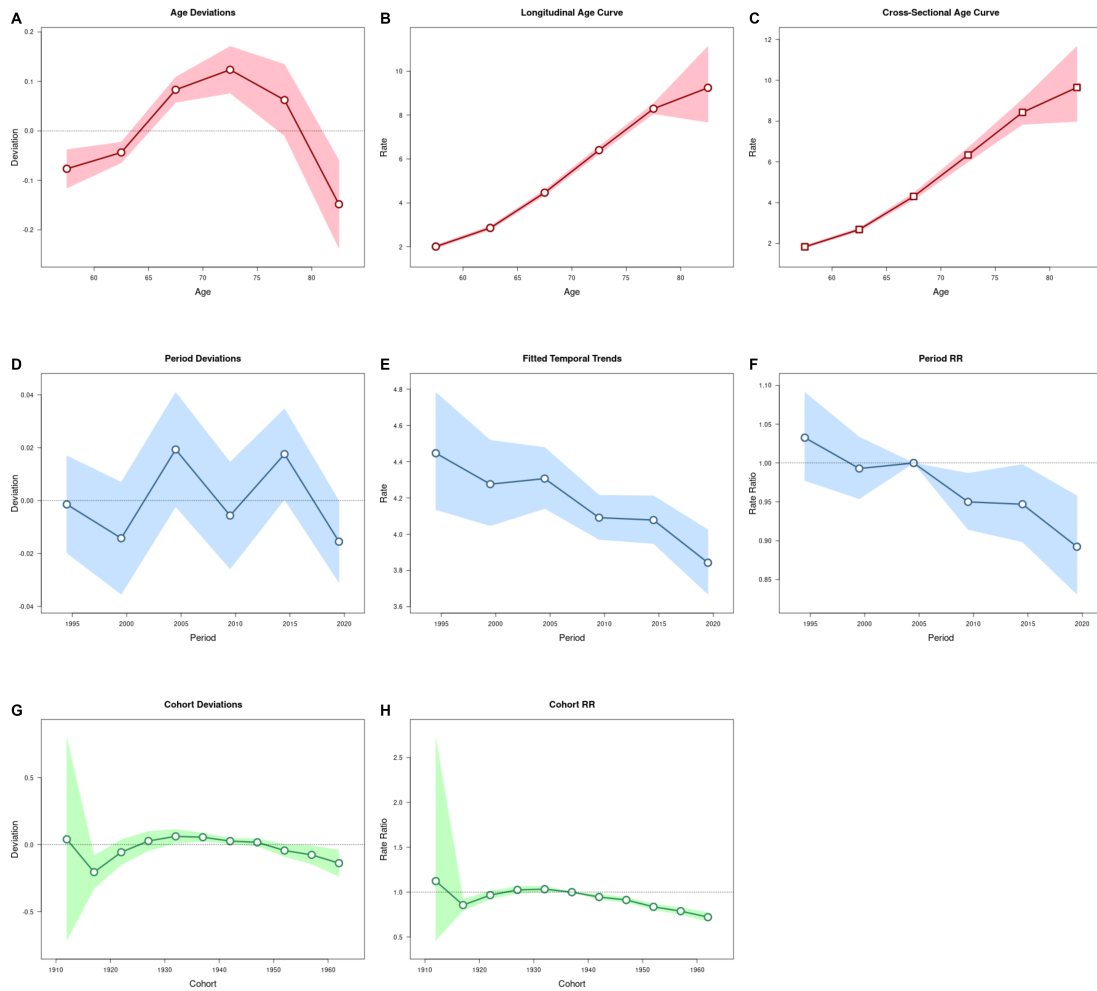


Figure S2 Smoking-associated T2DM - Related Deaths Burden Among Middle - aged and Elderly Chinese Adults: Results of Age - Period - Cohort Analysis Displaying Trends and Deviations in Rates across Age, Period, and Cohort Dimensions. (A) Age Deviations; (B) Longitudinal Age Curve; (C) Cross - Sectional Age Curve; (D) Period Deviations; (E) Fitted Temporal Trends; (F) Period RR; (G) Cohort Deviations; (H) Cohort RR.

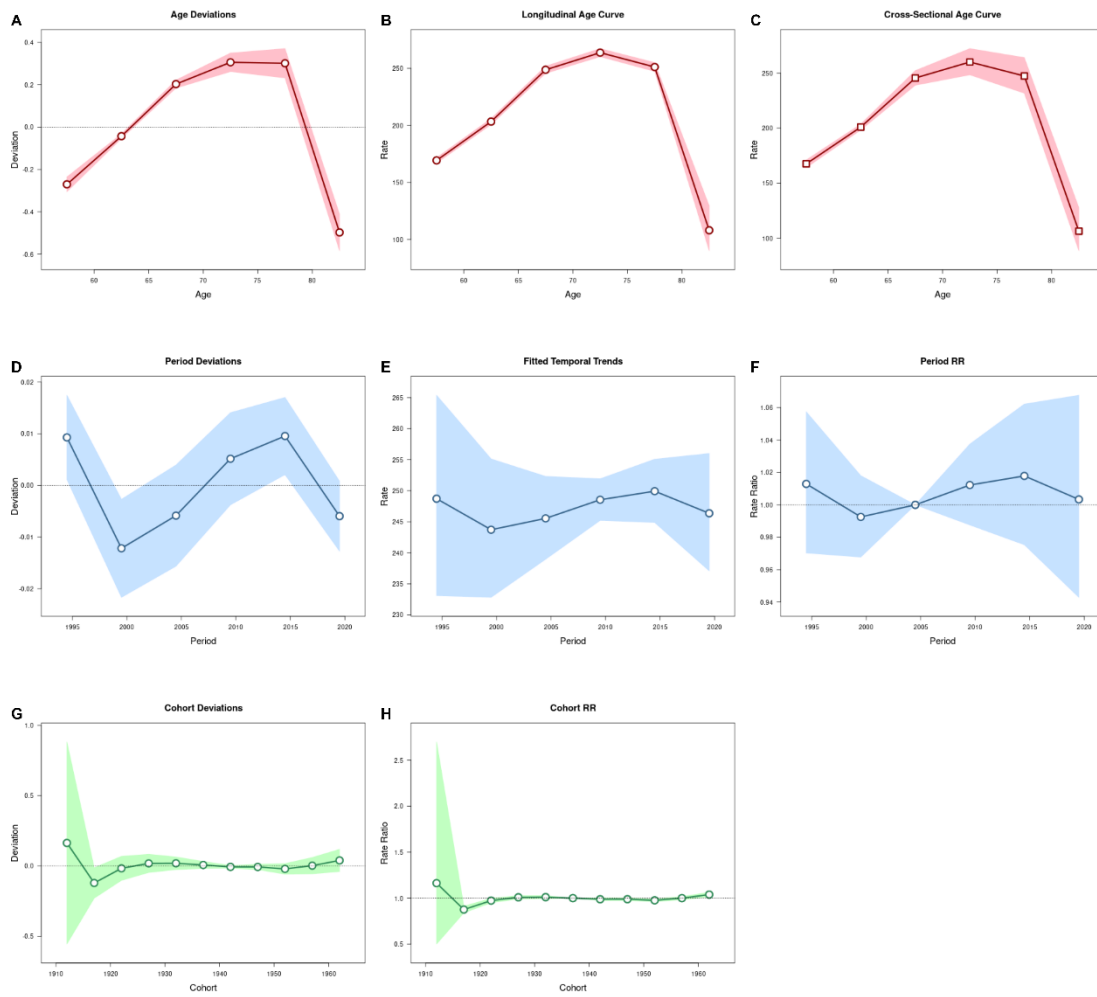


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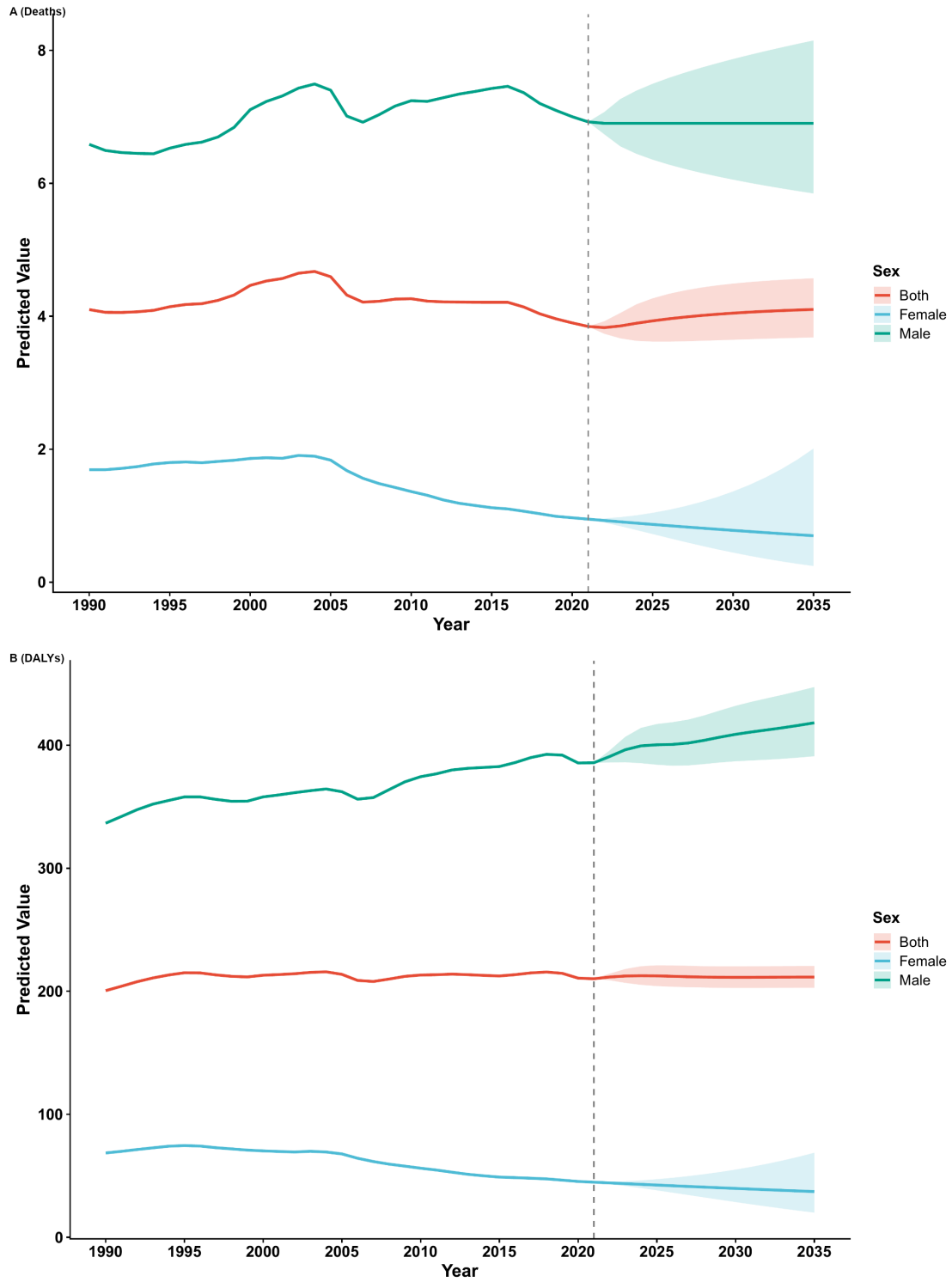


Figure S4 Predicted trends of tobacco-induced low back pain over the next 15 years (2022-2036) (A. Rate of Deaths; B. Rate of DALYs). Lines represent the true and predicted trend; shaded regions represent the predicted trend's 95% CI.