

Supplementary information for “Modelling the population health impacts of heated tobacco products in Japan”

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S1 Data sources

Demographic data for Japan was obtained from publicly available sources in October 2018. Data was collected following priority criteria in which data was first searched from Japanese governmental or public institutions, preferably facilitating appropriate breakdown by age and sex; in absence of such data, data published in peer-reviewed journals and collapsed by age, sex or both were used. This search was performed for each data input displayed in Table 1. Demographic data requirements included initial population estimates and recorded deaths for the year 2004, and historic and projected net migration and birth rates for years 2004 through to 2065. As well as smoking prevalence data for the year 2004 to initiate the model, and subsequent years to aid in parameter calibration. Publicly sourced data can be found in supplementary information.

Table S1: Public data sources

Input Data	Source
Japan Population Estimates	Population Census by Statistics Bureau, Ministry of Internal Affairs and Communications (Japan). https://www.stat.go.jp/
Historic Birth Rates	Vital Statistics by Ministry of Health Labour and Welfare (MHLW, Japan) Table 4 Live births by sex month of birth age of mother and live birth order. https://www.mhlw.go.jp/
Projected Birth Rates	National Institute of Population and Social Security Research in Japan Population Projections for Japan (2017): 2016 to 2065 http://www.ipss.go.jp/pp-zenkoku/e/zenkoku_e2017/pp29_summary.pdf
Initial Mortality Proportions	Life Table by Ministry of Health Labour and Welfare (MHLW, Japan, 2000) Table A. Abridged life tables for 2000 https://www.mhlw.go.jp/english/database/db-hw/lifetb00/part5.html
Projected Annual Reduction to Death Rates	Life Table by Ministry of Health Labour and Welfare (MHLW, 2000) Life Table by Ministry of Health Labour and Welfare (MHLW, 2015)
Life Expectancy	Life Table by Ministry of Health Labour and Welfare (MHLW, 2015) https://www.mhlw.go.jp/english/database/db-hw/lifetb15/dl/lifetb15-05.pdf
Historic Net Migration	Statistics Bureau, Ministry of Internal Affairs and Communications

Projected Net Migration	Population Projections for Japan (2017) Table 4-3: Age-specific net international migration rates by sex for Japanese Table 4-4: Number of net migrants of non-Japanese origin by sex Table 4-5: Age distributions of net migrants of non-Japanese origin by sex
Smoking Prevalence	Comprehensive Survey of Living Conditions by Ministry of Health, Labour and Welfare https://www.mhlw.go.jp/english/database/db-hss/cslc-index.html

Model structure

Population cohorts separated by product use characteristics are represented in the model by stocks, and the movement between these stocks are shows as flows (Figure S1)

Schematic of stocks and flow for cohorts.

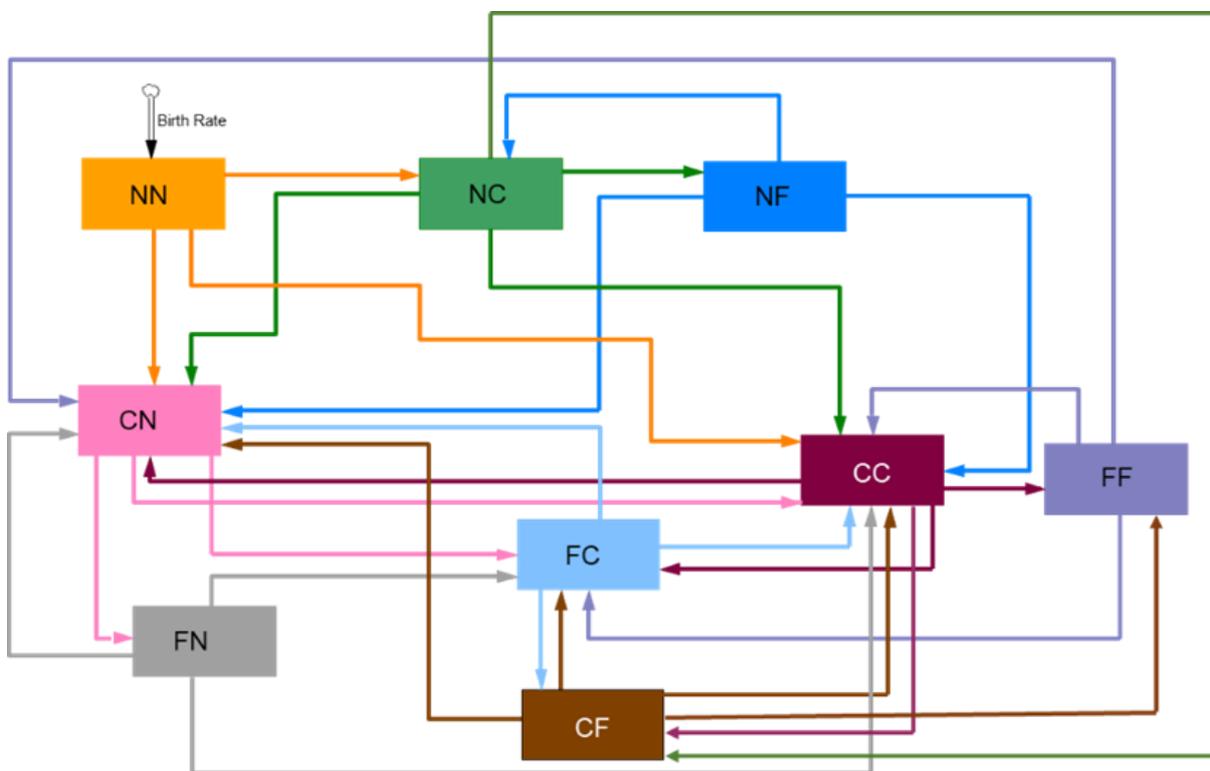


Figure S1. Representation of transitions (arrows) in a 2-product model and cohorts or stocks. These are annotated according to product use where N=Never, C=Current, F=Former. The first letter represents smoking status and the second THP use.

Table S2. Description of model stock definitions.

Stock Nomenclature	Smoking Status	THP Status
NN	Never Smoker	Never THP User
NC	Never Smoker	Current THP User
NF	Never Smoker	Former THP User
CN	Current Smoker	Never THP User
CC	Current Smoker	Current THP User
CF	Current Smoker	Former THP User
FN	Former Smoker	Never THP User
FC	Former Smoker	Current THP User
FF	Former Smoker	Former THP User

Population Categories Definitions

Gender

- Male
- Female

Age

Single Year Ages

- 0
- 1
- 2
- 3
- 4
- ...
- 84
- 85+

Age Cohorts

- AGED UNDER 12
- AGED 12 TO 14 YEARS
- AGED 15 TO 19 YEARS
- AGED 20 TO 24 YEARS
- AGED 25 TO 29 YEARS
- AGED 30 TO 34 YEARS
- AGED 35 TO 39 YEARS
- ...
- AGED 80 TO 84 YEARS
- AGED 85 PLUS YEARS

Race/Ethnicity

- ALL Race/Ethnicity grouped

Smoking Status

- Never Smoker Less than 100 cigarettes in lifetime
- Current Smoker More than 100 cigarettes in lifetime and smoked in last year
- Former Smoker More than 100 cigarettes in lifetime and not smoked in last year

Tobacco Heating Product Status

- Never THP User – Less than 100 heat sticks in lifetime
- Current THP User – More than 100 heat sticks in lifetime and used in last year
- Former THP User- More than 100 heat sticks in lifetime and not used in last year

Duration of Quitting

- 1 - 2 years
- 3 – 5 years
- 6 – 10 years
- 11 – 20 years
- 20+ years

Demographic Data

Population Estimates

Population estimates for Japan in year 2004

Source: Population Census by Statistics Bureau, Ministry of Internal Affairs and Communications (Japan)

Units: Thousand People

Link: <https://www.stat.go.jp/>

Table S3. Population estimates for Japan in year 2004.

Japan Population Estimates (Thousand People) 2004														
Age	Male	Female	Age	Male	Female	Age	Male	Female	Age	Male	Female	Age	Male	Female
0	573	545	20	772	735	40	829	818	60	872	921	80	300	480
1	577	546	21	781	747	41	810	801	61	846	895	81	249	455
2	595	564	22	781	747	42	784	776	62	869	921	82	215	418
3	600	569	23	790	754	43	773	765	63	841	898	83	187	380
4	598	568	24	831	787	44	780	773	64	765	823	84	179	372
5	598	570	25	843	801	45	795	790	65	664	719	85	132	277
6	612	582	26	866	828	46	773	771	66	704	773	86	120	264
7	608	580	27	878	846	47	754	750	67	723	799	87	106	241
8	607	577	28	918	889	48	793	790	68	716	799	88	92	220
9	616	588	29	956	931	49	821	818	69	677	768	89	77	191
10	618	589	30	1,005	980	50	820	820	70	632	728	90	62	163
11	610	580	31	1,020	1,002	51	871	877	71	623	732	91	51	142
12	621	590	32	1,004	982	52	918	927	72	599	712	92	39	117
13	620	590	33	977	960	53	975	983	73	568	689	93	30	94
14	635	605	34	954	936	54	1,049	1,061	74	530	653	94	21	73
15	648	617	35	933	920	55	1,147	1,166	75	499	634	95	15	56
16	675	640	36	914	902	56	1,139	1,160	76	469	610	96	11	41
17	693	659	37	915	902	57	1,083	1,103	77	436	584	97	7	29
18	710	673	38	711	705	58	675	696	78	406	569	98	5	21
19	740	705	39	886	874	59	718	754	79	358	532	99	3	12
												100+	4	21

Birth Rate

Two sources of data were used for birth rates, one to cover the historic period of 2000-2018, the other for the projection period 2019-2065. Beyond 2065 a simple linear extrapolation was used for 2066-2100.

Historic Birth Rate

Source: Vital Statistics by Ministry of Health Labour and Welfare (MHLW, Japan)
Table 4 Live births by sex month of birth age of mother and live birth order
Units: Thousand People/Year
Link: <https://www.mhlw.go.jp/>

Table S4. Japan historic birth rate.

Birth Rate (Thousand Births/Year)					
Year	Male	Female	Year	Male	Female
2000	612.1	578.4	2011	538.3	512.5
2001	600.9	569.7	2012	531.8	505.5
2002	592.8	561.0	2013	527.7	502.2
2003	576.7	546.9	2014	515.5	488.0
2004	569.6	541.2	2015	515.5	490.2
2005	545.0	517.5	2016	501.9	475.1
2006	560.4	532.2	2017	484.4	461.6
2007	559.8	530.0	2018	470.9	447.5
2008	559.5	531.6			
2009	549.0	521.0			
2010	550.7	520.6			

Projected Birth Rate

Source: National Institute of Population and Social Security Research in Japan
Population Projections for Japan (2017): 2016 to 2065

Units: Thousand People/Year

Link: http://www.ipss.go.jp/pp-zenkoku/e/zenkoku_e2017/pp29_summary.pdf

Table S5. Japan projected birth rate.

Projected Birth Rate (Thousand Births/Year)								
Year	Male	Female	Year	Male	Female	Year	Male	Female
2019	472.2	448.8	2050	335.8	319.2	2081	242.9	230.9
2020	462.4	439.6	2051	331.5	315.1	2082	240.2	228.4
2021	454.2	431.8	2052	327.2	311.0	2083	237.6	225.8
2022	447.0	425.0	2053	322.9	306.9	2084	234.9	223.3
2023	440.9	419.1	2054	318.6	302.8	2085	232.2	220.8
2024	436.3	414.7	2055	314.3	298.7	2086	229.6	218.2
2025	432.7	411.3	2056	311.2	295.8	2087	226.9	215.7
2026	429.6	408.4	2057	308.1	292.9	2088	224.2	213.2
2027	427.6	406.4	2058	305.0	290.0	2089	221.6	210.6
2028	425.0	404.0	2059	302.0	287.0	2090	218.9	208.1
2029	422.4	401.6	2060	298.9	284.1	2091	216.2	205.6
2030	419.4	398.6	2061	296.2	281.6	2092	213.6	203.0
2031	415.8	395.2	2062	293.6	279.0	2093	210.9	200.5
2032	412.7	392.3	2063	290.9	276.5	2094	208.2	198.0
2033	408.6	388.4	2064	288.2	274.0	2095	205.6	195.4
2034	405.0	385.0	2065	285.6	271.4	2096	202.9	192.9
2035	400.9	381.1	2066	282.9	268.9	2097	200.2	190.4
2036	396.8	377.2	2067	280.2	266.4	2098	197.6	187.8
2037	392.7	373.3	2068	277.6	263.8	2099	194.9	185.3
2038	388.6	369.4	2069	274.9	261.3	2100	192.3	182.7
2039	384.5	365.5	2070	272.2	258.8			
2040	380.4	361.6	2071	269.6	256.2			
2041	376.3	357.7	2072	266.9	253.7			
2042	371.7	353.3	2073	264.2	251.2			
2043	367.6	349.4	2074	261.6	248.6			
2044	363.0	345.0	2075	258.9	246.1			
2045	358.9	341.1	2076	256.2	243.6			
2046	354.3	336.7	2077	253.6	241.0			
2047	349.6	332.4	2078	250.9	238.5			
2048	345.0	328.0	2079	248.2	236.0			
2049	340.4	323.6	2080	245.6	233.4			

Note:

Projected births are based on data for total projected births and assuming 105.2 male births to every 100 female births.

Initial Mortality Rates

Source: Life Table by Ministry of Health Labour and Welfare (MHLW, Japan, 2000)

Table A. Abridged life tables for 2000

Units: Proportion/Year

Link: <https://www.mhlw.go.jp/english/database/db-hw/lifetb00/part5.html>

Table S6. Initial mortality rates.

Mortality Proportion Per Year (2000)								
Age	Male	Female	Age	Male	Female	Age	Male	Female
0	0.345%	0.298%	35	0.099%	0.054%	70	2.384%	0.999%
1	0.051%	0.044%	36	0.105%	0.058%	71	2.605%	1.106%
2	0.038%	0.030%	37	0.114%	0.062%	72	2.850%	1.228%
3	0.027%	0.020%	38	0.125%	0.067%	73	3.126%	1.371%
4	0.021%	0.014%	39	0.136%	0.072%	74	3.437%	1.539%
5	0.018%	0.012%	40	0.147%	0.078%	75	3.784%	1.740%
6	0.016%	0.011%	41	0.159%	0.085%	76	4.162%	1.974%
7	0.014%	0.010%	42	0.173%	0.094%	77	4.606%	2.249%
8	0.012%	0.009%	43	0.190%	0.104%	78	5.127%	2.573%
9	0.011%	0.008%	44	0.210%	0.113%	79	5.731%	2.944%
10	0.010%	0.008%	45	0.232%	0.122%	80	6.401%	3.365%
11	0.011%	0.008%	46	0.258%	0.131%	81	7.156%	3.837%
12	0.013%	0.008%	47	0.287%	0.143%	82	7.962%	4.356%
13	0.016%	0.008%	48	0.318%	0.158%	83	8.813%	4.934%
14	0.021%	0.010%	49	0.352%	0.175%	84	9.699%	5.581%
15	0.027%	0.012%	50	0.392%	0.196%	85	10.640%	6.316%
16	0.036%	0.016%	51	0.435%	0.215%	86	11.678%	7.155%
17	0.046%	0.019%	52	0.480%	0.233%	87	12.806%	8.085%
18	0.054%	0.022%	53	0.527%	0.251%	88	14.042%	9.117%
19	0.060%	0.023%	54	0.575%	0.266%	89	15.378%	10.252%
20	0.063%	0.025%	55	0.625%	0.279%	90	17.013%	11.550%
21	0.065%	0.027%	56	0.678%	0.294%	91	18.465%	12.979%
22	0.067%	0.028%	57	0.737%	0.313%	92	19.968%	14.472%
23	0.069%	0.030%	58	0.795%	0.334%	93	21.523%	15.966%
24	0.069%	0.030%	59	0.854%	0.356%	94	23.129%	17.498%
25	0.068%	0.031%	60	0.923%	0.383%	95	24.787%	19.062%
26	0.066%	0.031%	61	1.007%	0.416%	96	26.496%	20.655%
27	0.065%	0.032%	62	1.106%	0.458%	97	28.255%	22.278%
28	0.067%	0.034%	63	1.226%	0.507%	98	30.065%	23.929%
29	0.071%	0.036%	64	1.359%	0.562%	99	31.923%	25.609%
30	0.077%	0.038%	65	1.498%	0.618%	100	33.828%	27.316%
31	0.082%	0.041%	66	1.646%	0.680%			
32	0.088%	0.044%	67	1.808%	0.748%			
33	0.092%	0.047%	68	1.988%	0.825%			
34	0.095%	0.050%	69	2.181%	0.907%			

Projected Annual Reduction to Death Rates

Source: Life Table by Ministry of Health Labour and Welfare (MHLW, 2000)

Life Table by Ministry of Health Labour and Welfare (MHLW, 2015)

Units: Percentage/Year

Link: <https://www.mhlw.go.jp/english/database/db-hw/lifetb00/part5.html>

<https://www.mhlw.go.jp/english/database/db-hw/lifetb15/dl/lifetb15-05.pdf>

Table S7. Projected annual reduction in death rates.

Average Annual Percentage Change								
Age	Male	Female	Age	Male	Female	Age	Male	Female
0	0.035	0.034	35	0.019	0.018	70	0.021	0.021
1	0.027	0.021	36	0.021	0.020	71	0.020	0.021
2	0.030	0.027	37	0.023	0.020	72	0.020	0.021
3	0.034	0.033	38	0.025	0.019	73	0.021	0.022
4	0.037	0.037	39	0.024	0.015	74	0.022	0.024
5	0.038	0.027	40	0.022	0.014	75	0.022	0.024
6	0.031	0.021	41	0.021	0.014	76	0.021	0.024
7	0.022	0.015	42	0.022	0.016	77	0.020	0.024
8	0.019	0.017	43	0.023	0.017	78	0.020	0.024
9	0.021	0.009	44	0.023	0.017	79	0.019	0.024
10	0.023	0.009	45	0.023	0.017	80	0.018	0.023
11	0.030	0.009	46	0.023	0.015	81	0.017	0.023
12	0.032	0.009	47	0.024	0.014	82	0.016	0.022
13	0.025	0.009	48	0.024	0.015	83	0.015	0.020
14	0.031	0.015	49	0.024	0.017	84	0.013	0.019
15	0.030	0.012	50	0.026	0.019	85	0.011	0.018
16	0.035	0.019	51	0.026	0.019	86	0.010	0.017
17	0.037	0.025	52	0.026	0.018	87	0.009	0.016
18	0.034	0.025	53	0.026	0.017	88	0.008	0.014
19	0.028	0.024	54	0.025	0.016	89	0.007	0.013
20	0.022	0.025	55	0.024	0.015	90	0.007	0.012
21	0.019	0.023	56	0.023	0.015	91	0.005	0.010
22	0.018	0.022	57	0.023	0.016	92	0.004	0.008
23	0.016	0.020	58	0.023	0.017	93	0.002	0.006
24	0.015	0.018	59	0.022	0.016	94	0.001	0.003
25	0.014	0.017	60	0.021	0.015	95	0.001	0.001
26	0.012	0.014	61	0.020	0.015	96	0.000	0.000
27	0.012	0.011	62	0.018	0.016	97	0.000	-0.002
28	0.013	0.011	63	0.019	0.017	98	0.000	-0.003
29	0.016	0.012	64	0.019	0.019	99	0.000	-0.004
30	0.019	0.013	65	0.019	0.019	100	0.000	-0.004
31	0.021	0.016	66	0.019	0.020			
32	0.023	0.017	67	0.020	0.021			
33	0.022	0.016	68	0.020	0.021			
34	0.020	0.016	69	0.020	0.022			

Estimates based on the average annual change in mortality proportions between 2000 and 2015.

Life Expectancy

Source: Life Table by Ministry of Health Labour and Welfare (MHLW, 2015)

Units: Years

Link: <https://www.mhlw.go.jp/english/database/db-hw/lifetb15/dl/lifetb15-05.pdf>

Table S8. Life expectancy in Japan.

Life Expectancy at Age								
Age	Male	Female	Age	Male	Female	Age	Male	Female
0	80.8	87.1	35	46.6	52.6	70	15.6	19.9
1	80.0	86.2	36	45.7	51.6	71	14.9	19.1
2	79.0	85.2	37	44.7	50.7	72	14.2	18.2
3	78.0	84.3	38	43.7	49.7	73	13.5	17.4
4	77.0	83.3	39	42.8	48.7	74	12.8	16.5
5	76.0	82.3	40	41.8	47.7	75	12.1	15.7
6	75.0	81.3	41	40.8	46.8	76	11.4	14.9
7	74.0	80.3	42	39.9	45.8	77	10.8	14.1
8	73.0	79.3	43	38.9	44.8	78	10.1	13.3
9	72.0	78.3	44	38.0	43.9	79	9.5	12.5
10	71.1	77.3	45	37.1	42.9	80	8.9	11.8
11	70.1	76.3	46	36.1	41.9	81	8.3	11.1
12	69.1	75.3	47	35.2	41.0	82	7.8	10.4
13	68.1	74.3	48	34.2	40.0	83	7.3	9.7
14	67.1	73.3	49	33.3	39.1	84	6.8	9.0
15	66.1	72.3	50	32.4	38.1	85	6.3	8.4
16	65.1	71.3	51	31.5	37.2	86	5.9	7.8
17	64.1	70.3	52	30.6	36.3	87	5.5	7.2
18	63.1	69.4	53	29.7	35.3	88	5.1	6.7
19	62.2	68.4	54	28.8	34.4	89	4.7	6.2
20	61.2	67.4	55	27.9	33.5	90	4.4	5.7
21	60.2	66.4	56	27.0	32.5	91	4.1	5.3
22	59.2	65.4	57	26.1	31.6	92	3.8	4.8
23	58.3	64.4	58	25.3	30.7	93	3.6	4.5
24	57.3	63.4	59	24.4	29.8	94	3.3	4.1
25	56.3	62.4	60	23.6	28.8	95	3.1	3.8
26	55.3	61.5	61	22.7	27.9	96	2.9	3.5
27	54.4	60.5	62	21.9	27.0	97	2.7	3.2
28	53.4	59.5	63	21.1	26.1	98	2.5	3.0
29	52.4	58.5	64	20.3	25.2	99	2.4	2.7
30	51.5	57.5	65	19.5	24.3	100	2.2	2.5
31	50.5	56.5	66	18.7	23.4			
32	49.5	55.6	67	17.9	22.5			
33	48.6	54.6	68	17.1	21.7			
34	47.6	53.6	69	16.4	20.8			

Net Migration

Historic Net Migration

Source: Statistics Bureau, Ministry of Internal Affairs and Communications,

Units: Thousand People/Year

Link: <http://www.ipss.go.jp/p-info/e/psj2012/PSJ2012-10.xls>

http://www.ipss.go.jp/pp-zenkoku/j/zenkoku2017/db_zenkoku2017/s_tables/app15.htm

Table S9. Historical net migration in Japan. (Top) Male, (Bottom) Female.

Male Net Migration (Thousand People/Year)														
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
2001	-3.62	-3.25	-2.27	4.61	15.18	9.55	6.19	4.45	1.03	1.24	1.88	1.92	5.84	9.10
2002	-2.14	1.60	2.40	5.83	7.95	-6.36	-7.69	-5.90	-5.23	-8.75	-12.82	-10.20	-9.36	-9.83
2003	-5.91	-2.02	-0.09	5.96	12.03	3.18	1.46	1.40	1.93	1.16	-0.79	-0.07	0.48	4.33
2004	-8.03	-4.13	-1.62	2.87	5.71	-1.78	-5.07	-4.82	-3.74	-2.62	-3.17	-3.86	-1.48	1.17
2005	-7.24	-5.21	-1.78	3.67	5.72	0.81	-2.69	-3.65	-1.94	-3.61	-4.00	-5.55	-2.73	0.35
2006	-6.18	-3.83	-1.87	6.54	17.75	6.52	-0.66	-2.40	-0.66	-0.31	-2.22	-3.77	-2.05	-0.02
2007	-7.57	-4.36	-1.80	5.52	19.78	9.10	0.15	-2.84	-1.59	-0.82	-2.06	-3.54	-3.20	-1.03
2008	-8.02	-4.69	-1.96	6.20	20.60	2.66	-5.16	-5.22	-4.45	-3.79	-3.52	-3.85	-3.65	-3.22
2009	-10.38	-5.89	-3.50	4.12	7.59	-14.63	-12.04	-9.12	-6.49	-5.67	-4.60	-3.91	-2.57	0.11
2010	-3.36	-1.32	0.30	4.04	13.27	-8.20	-7.63	-5.33	-2.02	-1.46	-1.59	-1.40	-0.20	1.52
2011	-5.77	-2.41	-0.22	5.00	7.32	-12.70	-11.43	-7.24	-3.47	-1.91	-1.93	-1.01	-0.98	-0.63
2012	-2.13	-1.62	-0.37	5.36	10.50	-7.72	-11.39	-9.51	-6.42	-5.14	-3.49	-2.32	-1.27	-1.16
2013	-0.89	0.03	1.16	8.21	17.54	-0.78	-4.76	-3.50	-2.43	-1.79	-1.68	-1.16	-0.75	-0.32
2014	-0.45	0.74	1.66	11.33	23.46	1.49	-2.62	-2.74	-1.26	-1.47	-0.85	-0.91	-0.38	-0.74
2015	-0.52	1.04	2.13	15.33	32.82	8.47	1.66	0.05	0.57	0.76	0.07	0.03	0.03	0.68

Female Net Migration (Thousand People/Year)														
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
2001	-3.79	-3.64	-3.45	3.41	24.16	20.11	13.32	5.87	2.40	1.82	6.14	8.84	9.61	9.13
2002	-2.38	1.42	2.11	7.42	9.41	3.45	8.42	8.90	4.06	-1.43	-7.84	-8.45	-8.06	-7.31
2003	-4.98	-1.59	0.20	5.37	10.35	6.33	7.17	5.50	4.51	1.82	0.73	1.82	2.36	5.20
2004	-7.65	-4.35	-1.71	5.08	2.69	-2.74	-2.55	-0.29	1.83	1.17	-0.70	0.52	1.03	3.18
2005	-7.13	-4.83	-2.31	6.37	-0.47	-4.72	-5.91	-3.37	-0.74	-1.33	-2.21	-0.64	0.23	2.16
2006	-6.05	-3.63	-1.78	10.61	12.48	0.14	-6.10	-4.93	-1.81	-1.64	-1.67	-1.78	-0.46	0.99
2007	-6.84	-3.56	-1.39	10.92	17.58	4.71	-5.41	-6.66	-3.44	-2.50	-2.34	-2.38	-0.81	-0.02
2008	-7.70	-4.44	-1.99	11.20	15.12	-0.81	-7.63	-8.70	-5.45	-3.68	-3.16	-3.84	-2.45	-3.03
2009	-9.93	-6.00	-3.73	7.82	2.95	-9.69	-11.05	-9.49	-6.78	-6.04	-4.17	-2.22	0.63	0.91
2010	-3.30	-0.98	0.17	7.77	10.65	-1.90	-3.46	-1.63	0.40	0.25	-0.14	0.86	2.31	2.40
2011	-5.19	-2.59	-0.52	7.30	-3.53	-13.23	-10.99	-5.73	-1.42	-1.15	-1.35	-1.18	-1.03	-1.02
2012	-1.73	-1.35	-0.42	6.82	2.10	-9.37	-9.60	-8.04	-6.59	-4.69	-3.91	-2.36	-1.52	-1.47
2013	-1.32	0.13	0.96	8.51	6.19	-2.01	-3.15	-1.64	0.53	-0.43	-0.30	-0.76	-0.45	-0.79
2014	-0.63	0.49	1.42	10.40	7.23	-3.96	-2.69	-0.39	0.66	-0.01	-0.69	-0.74	-0.59	-1.39
2015	-0.42	1.06	1.90	13.38	16.50	-0.27	-1.48	-0.08	1.57	0.75	-0.20	-0.39	-0.45	-0.55

Projected Net Migration

Sources: Population Projections for Japan (2017)
 Table 4-3: Age-specific net international migration rates by sex for Japanese
 Table 4-4: Number of net migrants of non-Japanese origin by sex
 Table 4-5: Age distributions of net migrants of non-Japanese origin by sex

Units: Thousand People/Year

Link: http://www.ipss.go.jp/pp-zenkoku/e/zenkoku_e2017/g_images_e/pp29gt0405e.htm
http://www.ipss.go.jp/pp-zenkoku/e/zenkoku_e2017/g_images_e/pp29gt0404e.htm
http://www.ipss.go.jp/pp-zenkoku/e/zenkoku_e2017/g_images_e/pp29gt0405e.htm

Table S10: Projected net migration in Japan. (Top) Male, (Bottom) Female.

Male Net Migration (Thousand People/Year)														
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
2020	-0.2	0.1	1.3	5.1	14.9	6.8	1.0	-1.0	-0.6	-0.4	-0.8	-0.6	-0.3	0.3
2030	-0.2	0.1	1.3	5.1	14.9	6.8	1.0	-1.0	-0.6	-0.4	-0.8	-0.6	-0.3	0.3
2040	-0.2	0.1	1.3	5.1	14.9	6.8	1.0	-1.0	-0.6	-0.4	-0.8	-0.6	-0.3	0.3
2050	-0.2	0.1	1.3	5.1	14.9	6.8	1.0	-1.0	-0.6	-0.4	-0.8	-0.6	-0.3	0.3
2060	-0.2	0.1	1.3	5.1	14.9	6.8	1.0	-1.0	-0.6	-0.4	-0.8	-0.6	-0.3	0.3
2070	-0.2	0.1	1.3	5.1	14.9	6.8	1.0	-1.0	-0.6	-0.4	-0.8	-0.6	-0.3	0.3
2080	-0.2	0.1	1.3	5.1	14.9	6.8	1.0	-1.0	-0.6	-0.4	-0.8	-0.6	-0.3	0.3
2090	-0.2	0.1	1.3	5.1	14.9	6.8	1.0	-1.0	-0.6	-0.4	-0.8	-0.6	-0.3	0.3
2100	-0.2	0.1	1.3	5.1	14.9	6.8	1.0	-1.0	-0.6	-0.4	-0.8	-0.6	-0.3	0.3

Female Net Migration (Thousand People/Year)														
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
2020	-0.1	0.5	1.2	6.4	14.0	3.3	0.5	0.2	1.1	0.8	-0.1	-0.3	-0.4	-0.4
2030	-0.1	0.5	1.2	6.4	14.0	3.3	0.5	0.2	1.1	0.8	-0.1	-0.3	-0.4	-0.4
2040	-0.1	0.5	1.2	6.4	14.0	3.3	0.5	0.2	1.1	0.8	-0.1	-0.3	-0.4	-0.4
2050	-0.1	0.5	1.2	6.4	14.0	3.3	0.5	0.2	1.1	0.8	-0.1	-0.3	-0.4	-0.4
2060	-0.1	0.5	1.2	6.4	14.0	3.3	0.5	0.2	1.1	0.8	-0.1	-0.3	-0.4	-0.4
2070	-0.1	0.5	1.2	6.4	14.0	3.3	0.5	0.2	1.1	0.8	-0.1	-0.3	-0.4	-0.4
2080	-0.1	0.5	1.2	6.4	14.0	3.3	0.5	0.2	1.1	0.8	-0.1	-0.3	-0.4	-0.4
2090	-0.1	0.5	1.2	6.4	14.0	3.3	0.5	0.2	1.1	0.8	-0.1	-0.3	-0.4	-0.4
2100	-0.1	0.5	1.2	6.4	14.0	3.3	0.5	0.2	1.1	0.8	-0.1	-0.3	-0.4	-0.4

Smoking Data

Smoking Status Definitions

- **Never Smoker**
Never smoked or smoked less than 100 cigarettes in lifetime
- **Current Smoker**
Smoked more than 100 cigarettes in lifetime and have smoked at least once in the last 12 months.
- **Former Smoker**
Smoked more than 100 cigarettes in lifetime and have not smoked in the last 12 months
- **Former Smoker Quit Time Distribution**
The distribution of the number of years a former smoker has quit smoking
- **Smoking Initiation**
An individual that goes from Never Smoker to Current Smoker over a one-year period
- **Smoking Cessation**
An individual that goes from Current Smoker to Former Smoker over a one-year period
- **Relapse**
An individual that goes from Former Smoker to Current Smoker over a one-year period
- **Smoking Initiation Trend**
The average annual percentage decline in smoking initiation rate

NOTE

The prevalence estimates will be slightly different to other published data due to our definitions of what constitutes a smoker or former smoker. Our smoking prevalence's are likely to be slightly higher as someone who quits will still be counted as a current smoker for the next 12 months.

Our definitions also mean that we are likely to see a larger prevalence of dual users and a lower percentage of people that have directly swapped cigarettes for Tobacco Heated Products (THP) when the THP is in the market place, as smokers that switch to the new product again will be defined as still being a current smoker for the next 12 months.

Initial Smoking Prevalence (2004)

Source: Comprehensive Survey of Living Conditions by MHLW

Units: Percentage

Link: <https://www.mhlw.go.jp/english/database/db-hss/cslc-index.html>

Table S11. Prevalence by smoking status.

Age	Smoking Status Prevalence					
	Never Smoker		Current Smoker		Former Smoker	
	Male	Female	Male	Female	Male	Female
0 - 11	100%	100%	0%	0%	0%	0%
12 - 14	99.8%	99.7%	0.1%	0.1%	0.1%	0.2%
15 - 19	90.1%	95.8%	9.6%	3.9%	0.3%	0.3%
20 - 24	48.2%	77.0%	50.4%	21.4%	1.4%	1.5%
25 - 29	41.9%	75.4%	55.6%	22.0%	2.4%	2.5%
30 - 34	40.1%	76.2%	56.9%	21.4%	3.0%	2.4%
35 - 39	40.6%	79.7%	56.2%	19.0%	3.2%	1.3%
40 - 44	41.5%	79.7%	54.5%	19.3%	4.0%	1.0%
45 - 49	42.5%	81.3%	54.2%	17.9%	3.3%	0.8%
50 - 54	43.8%	84.7%	52.9%	14.5%	3.3%	0.8%
55 - 59	47.3%	87.0%	49.1%	12.4%	3.5%	0.6%
60 - 64	55.9%	90.2%	40.3%	9.3%	3.8%	0.5%
65 - 69	63.0%	92.4%	33.1%	7.1%	3.9%	0.5%
70 - 74	67.3%	93.5%	28.2%	6.1%	4.5%	0.5%
75 - 79	70.2%	94.7%	25.6%	4.8%	4.2%	0.5%
80 - 84	74.5%	95.4%	20.8%	4.0%	4.7%	0.6%
85+	81.3%	96.0%	14.9%	3.3%	3.8%	0.7%

Former Smoker Quit Time Distribution

Source: Estimating the population health impact of introducing a reduced-risk tobacco product into Japan. The effect of differing assumptions, and some comparisons with the U.S

Units: Percentage

Link: <https://pubmed.ncbi.nlm.nih.gov/30367904/>

Table S12. Former smoker quit distribution by sex.

Male Former Smokers	Years Quit					
	0	1-2	3-5	6-10	11-20	21+
0-11	100.0	0.0	0.0	0.0	0.0	0.0
12-14	100.0	0.0	0.0	0.0	0.0	0.0
15-19	100.0	0.0	0.0	0.0	0.0	0.0
20-24	18.1	29.1	36.0	13.2	3.6	0.0
24-29	18.1	29.1	36.0	13.2	3.6	0.0
30-34	14.4	17.2	24.8	18.3	24.9	0.3
35-39	14.4	17.2	24.8	18.3	24.9	0.3
40-44	9.4	10.0	23.7	12.5	30.5	13.8
45-49	9.4	10.0	23.7	12.5	30.5	13.8
50-54	8.8	10.3	19.1	4.4	22.0	35.3
55-59	8.8	10.0	19.1	4.4	22.0	35.3
60-64	7.1	0.0	28.6	14.3	21.4	28.6
65-69	7.1	0.0	28.6	14.3	21.4	28.6
70-74	7.1	0.0	28.6	14.3	21.4	28.6
75-79	7.1	0.0	28.6	14.3	21.4	28.6
80-84	7.1	0.0	28.6	14.3	21.4	28.6
85+	7.1	0.0	28.6	14.3	21.4	28.6

Female Former Smokers	Years Quit					
	0	1-2	3-5	6-10	11-20	21+
0-11	100.0	0.0	0.0	0.0	0.0	0.0
12-14	100.0	0.0	0.0	0.0	0.0	0.0
15-19	100.0	0.0	0.0	0.0	0.0	0.0
20-24	18.1	29.1	36.0	13.2	3.6	0.0
24-29	18.1	29.1	36.0	13.2	3.6	0.0
30-34	14.4	17.2	24.8	18.3	24.9	0.3
35-39	14.4	17.2	24.8	18.3	24.9	0.3
40-44	9.4	10.0	23.7	12.5	30.5	13.8
45-49	9.4	10.0	23.7	12.5	30.5	13.8
50-54	8.8	10.3	19.1	4.4	22.0	35.3
55-59	8.8	10.0	19.1	4.4	22.0	35.3
60-64	7.1	0.0	28.6	14.3	21.4	28.6
65-69	7.1	0.0	28.6	14.3	21.4	28.6
70-74	7.1	0.0	28.6	14.3	21.4	28.6
75-79	7.1	0.0	28.6	14.3	21.4	28.6
80-84	7.1	0.0	28.6	14.3	21.4	28.6
85+	7.1	0.0	28.6	14.3	21.4	28.6

Smoking Initiation

Source: (1) Comprehensive Survey of Living Conditions by MHLW
(2) Health Care Issues in the United States and Japan
(3) Smoking and Lung Cancer Risk in American and Japanese Men:
An International Case-Control Study

Units: Percentage

Link: (1) <https://www.mhlw.go.jp/english/database/db-hss/cslc-index.html>
(2) ISBN: 0-262-90292-7
(3) <https://cebp.aacrjournals.org/content/cebp/10/11/1193.full.pdf>

Table S13. Ever smoking initiation.

Age	Ever Smoking Initiation Probability (2004)	
	Male	Female
20	58.1%	24.6%

Note

We assumed that smokers started smoking at the age of 20 years (the legal age of smoking in Japan) and estimated the initial initiation probability from the percentage of ever smokers in the 20-29 age cohort in the 2004 survey.

According to reference (2) the mean age of smoking initiation in Japan is estimated to be 20.7 years, with a standard deviation of 5.0 years. Source (3) estimated the average age of smoking onset was 19.3 years (95% CI: 2.9 years).

Smoking Initiation Trend

Source: Comprehensive Survey of Living Conditions by MHLW (2004, 2007, 2010, 2013, 2016)

Units: Percentage

Link: <https://www.mhlw.go.jp/english/database/db-hss/cslc-index.html>

Table S14. Annual decline in smoking initiation.

Age	Average Annual Decline in Smoking Initiation Probability	
	Male	Female
20	4.6%	6.7%

An estimate of the trend in smoking initiation was derived from the average annual decline in ever smoking prevalence in the 20 – 29 age cohort over the period of 2004 to 2016.

Smoking Cessation

Source: (1) Comprehensive Survey of Living Conditions by MHLW (2004, 2007, 2010, 2013, 2016)
(2) Web-based survey on smoking cessation behaviors of current and former smokers in Japan

Units: Percentage/Year

Link: (1) <https://www.mhlw.go.jp/english/database/db-hss/cslc-index.html>
(2) <https://www.tandfonline.com/doi/full/10.1185/03007995.2014.938149>

Table S15. Annual quitting probability.

Annual Quit Probability		
Age Cohort	Male	Female
20-29	2.2%	5.4%
30-39	3.6%	3.0%
40-49	3.9%	3.1%
50-59	4.6%	4.6%
60-69	6.9%	6.2%
70-79	9.2%	9.9%
80+	9.1%	8.5%

Note

The quit probabilities were estimated by calibrating the model to the observed smoking prevalence's, using the initiation probabilities, trend in initiation probabilities and relapse probabilities. A calibration method of minimising the 'Mean Average Error Over Mean' statistic was used for each gender and adult age cohort to estimate the quit probabilities to align modelled and observed smoking prevalence's from 2004 to 2016, prior to any significant impact of Tobacco Heating products.

The age adjusted quit probabilities based on the probabilities above are 4.4% for males and 4.6% for females.

The mean age at which smokers quit based on these quit probabilities is 42 years and 34 years for males and females, respectively. Source (2) estimates the mean age at which former smokers had quit smoking was 36.8 (11.3) years

Smoking Relapse

Source: (1) Long-Term Smoking Relapse: A Study Using the British Household Panel Survey
(2) Nicotine replacement therapy for long-term smoking cessation: a meta-analysis

Units: Percentage/Year

Link: <https://pubmed.ncbi.nlm.nih.gov/21036960/>
<https://tobaccocontrol.bmj.com/content/15/4/280.full>

Table S16. Annual smoking relapse probability.

Years Quit	Annual Relapse Probability
1 - 2 years	14.80%
2 - 3 years	9.92%
3 - 4 years	6.65%
4 - 5 years	4.46%
5 - 6 years	2.99%
6 - 7 years	2.00%
7 - 8 years	1.34%
8 - 9 years	0.90%
9 - 10 years	0.60%
10 - 11 years	0.40%
11 - 12 years	0.27%
12 - 13 years	0.18%
13 - 14 years	0.12%
14 - 15 years	0.08%
15 - 16 years	0.05%
16 - 17 years	0.04%
17 - 18 years	0.02%
18 - 19 years	0.02%
19 - 20 years	0.01%
20 - 21 years	0.00%

The annual relapse probability for former smokers that have successfully for 1 year or more by the number of years abstinent. Using these estimates, 37% of former smokers will relapse after 1 year of abstinence. The data estimates are based on a UK sample. Paper (2) estimated 30% of those regarded as quitters after 12 months will subsequently relapse across a meta-analysis of twelve eligible trials. No data could be found for the specific long term relapse of former smokers in Japan and sensitivity analysis will be performed to test how output variables are affected on these inputs.

Current Smoker Relative Risk (All Cause Mortality)

Source: Population attributable numbers and fractions of deaths due to smoking: a pooled analysis of 180,000 Japanese.

Units: Dimensionless

Link: <https://pubmed.ncbi.nlm.nih.gov/21111753/>

Table S17. Mortality relative risk for current smokers.

	Male	Female
Under 40	1.00	1.00
40-44	1.59	0.95
45-49	1.59	0.95
50-54	1.64	2.21
55-59	1.64	2.21
60-64	1.96	1.70
65-69	1.96	1.70
70-74	1.53	1.74
75-79	1.53	1.74
80-84	1.30	1.39
85+	1.30	1.39

Former Smoker Excess Risk Half Life Decay (All Cause)

Source: How rapidly does the excess risk of lung cancer decline following quitting smoking? A quantitative review using the negative exponential model.

Units: Dimensionless

Link: <https://pubmed.ncbi.nlm.nih.gov/23764305/>

Table S18. Decay in all mortality risk for former smokers.

Continent	Years	
	Half-Life	95% Confidence interval
Asia	7.32	(4.91–10.01)

Note

The half-life estimate for Lung Cancer is used for All Causes

THP Data

THP User Relative Risk Ratio

Source: (1) Statement on the toxicological evaluation of novel heat-not-burn tobacco products, The Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT), Department of Health UK, December 2017
(2) Heat-not-burn tobacco products: a systematic literature review

Units: Dimensionless

Link: (1)https://cot.food.gov.uk/sites/default/files/heat_not_burn_tobacco_statement.pdf
(2)<https://tobaccocontrol.bmj.com/content/28/5/582>

Table S19. Assumption of risk ratio of THP use to smoking.

	Default Value	Minimum Value	Maximum Value
Risk Reduction Ratio	10%	10%	50%

The risk reduction ratio compared to conventional cigarette smoking

The UK Toxicity of Chemicals in Food, Consumer Products and the Environment (1) estimated a potential harm reduction was approximately 50% - 90% to harmful and potentially harmful compounds (HPHCs).

The meta-analysis from source (2) concluded THPs exposed users and bystanders to toxicants, although at substantially lower levels than cigarettes, the reduction varied between 42% and 96%.

THP Transitions

For THPs, transition rates were obtained using data collected from a cross-sectional population survey in Japan. This study began with a pilot survey in 2018 followed by repeated nationally representative waves over a period of three years [Adamson et al. 2019]. Eligible participants were age 20 years and above. The purpose of the survey was to establish tobacco usage behaviours in Japan, with a focus on the impact of tobacco heating products. Results from this study have been reported by Jones and colleagues [Jones et al. 2020, Adamson et al. 2020]

Estimates for the transitions used here are based on the combined weighted results of the pilot and Wave 1 surveys. Sex specific rates were utilised for most transitions; however, age specific transitions were not available due to low frequencies when subdivided by age categories. For THP users Switching to Dual use (NC to CC) and dual users quitting both products (CC to FF), no female transition was captured in the survey. Thus, the value across both sexes was applied across both males and females. For THP quitting rates, the same quit probabilities as those used for smokers were applied. The sensitivity of this assumption was tested.

For THP relapse, the same relapse probabilities as for smokers were utilised, based on the number of years abstinent. Data from the survey was used to inform the proportion of relapses that fall back into each different product use category (THP, Cigarette or dual use).

Source : (1) Protocol for a Japanese nationwide repeated cross-sectional study to assess tobacco and nicotine product use behaviour after market introduction of tobacco heating products (THPs)
 (2) Results from a 2018 cross-sectional survey in Tokyo, Osaka and Sendai to assess tobacco and nicotine product usage after the introduction of heated tobacco products (HTPs) in Japan

Link : (1) <https://europepmc.org/article/ppr/ppr80070>
 (2) <https://harmreductionjournal.biomedcentral.com/articles/10.1186/s12954-020-00374-3>

Except where stated differently, all the following transition distributions were provided by the study
 “Repeated Cross-Sectional Study to Assess Tobacco and Nicotine Usage Patterns and Behaviour After Market Introduction of glo in Japan” – Kantar Health

This study is an epidemiological population survey. The study consists of multiple repeated cross-sectional surveys over a period of three years. At the beginning of the first study year a pilot study was implemented to test the envisaged approach. This was followed by nationally representative waves conducted at regular intervals up to twice a year. The study started in Q2 2018 with the pilot, concluding with the final wave due in 2020.

The estimates below are based on the combined results of the pilot and Wave 1 surveys.

Table S20. Transition rates between into and between the 2 products.

THP Initiation (NN-NC)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	0.1	0	0.4
Female	0.2	0	0.5

Dual Use Initiation (NN-CC)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	0.1	0.0	0.4
Female	0.0	0.0	0.1

Smokers Switching to THP (CN-FC)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	0.4	0.1	13
Female	1.2	0.3	3.3

Smokers Switching to Dual Use (CN-CC)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	9.8	7.5	12.6
Female	8.4	5.6	12.0

THP Users Switching to Smoking (NC-CF)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	0.0		
Female	0.0		

The survey did not capture any direct gateway from THP initiators to smoking only. It is assumed that this element of the gateway is included in the transition to THP initiator to dual user due to the definition of a former user requiring 12 months abstinence.

THP Users Switching to Dual Use (NC-CC)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	3.0	0	20.5
Female			

As no female transitions were captured in the survey data the across both genders, the same value is used for both males and females

THP Users Quitting (NC-NF)

Units: Percentage/Year

Annual Quit Probability		
Age Cohort	Male	Female
20-29	2.2%	5.4%
30-39	3.6%	3.0%
40-49	3.9%	3.1%
50-59	4.6%	4.6%
60-69	6.9%	6.2%
70-79	9.2%	9.9%
80+	9.1%	8.5%

The survey did not capture any NC THP cessation. The same quit probabilities of THP as that of smokers are assumed. The THP transition probability sensitivity testing includes scalars to NC quit probability between 50% greater and 50% less than smoking quit probabilities.

Dual Users Switching to Smoking Only (CC-CF)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
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Male	3.9	1.4	8.4
Female	7.3	0.6	26.5

Dual Users Switching to THP Only (CC-FC)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	31.9	24.1	40.6
Female	36.5	23.1	51.7

Dual Users Quitting Both Products (CC-FF)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	2.1	0.5	5.9
Female			

The survey did not capture any female transition. The across both genders value is used for male and female transition probability.

Former Smokers Relapse Destination (FN-CN, FN-FC, FN-CC)

Units: Dimensionless

	Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Smoking Only (CN)	Male	1.0	0.3	2.2
	Female	2.3	0.9	4.7
THP Only (FC)	Male	0.1	0.0	0.5
	Female	0.5	0.1	1.8
Dual Use (CC)	Male	0.4	0.1	1.2
	Female	0.3	0.0	1.7

The survey data above is used to proportionally allocate the former smoker relapse to smoking only, THP only or to dual use. The allocation proportions are shown below.

	Gender	Weighted Percentage [%]
Smoking Only (CN)	Male	67%
	Female	74%
THP Only (FC)	Male	7%
	Female	16%
Dual Use (CC)	Male	27%
	Female	10%

Former THP User Relapse Destination (NF-CF, NF-NC, NF-CC)

Units: Dimensionless

	Gender	Weighted Percentage [%]
Smoking Only (CF)	Male	7%
	Female	16%
THP Only (NC)	Male	67%
	Female	74%
Dual Use (CC)	Male	27%
	Female	10%

The survey data did not capture any former THP (NF) relapse. The same relapse probabilities are used as for former smokers. The THP transition probability sensitivity testing includes scalars to NF relapse probability between 50% greater and 50% less than smoking relapse probabilities.

The allocation weightings to relapse destination for former THP users above are based on those for Former Smoker relapse, using relapse allocations to the 'same' or 'different' or 'dual' product use.

Former Smoker and Former THP User Relapse Destination (FF-CF, FF-FC, FF-CC)

Units: Dimensionless

	Gender	Weighted Percentage [%]
Smoking Only (CF)	Male	7%
	Female	16%
THP Only (FC)	Male	67%
	Female	74%
Dual Use (CC)	Male	27%
	Female	10%

The survey data did not capture any former smokers and former THP users (FF) relapse. The same relapse probabilities are used as for former smokers. The THP transition probability sensitivity testing includes scalars to NF relapse probability between 50% greater and 50% less than smoking relapse probabilities.

The allocation weightings to relapse destination are the same as those for former THP users

THP Users Former Smokers Switching to Dual Use (FC-CC)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	0.9	0.0	7.4
Female			

No transition for females was captured in the survey, the across both genders value is used for the transition probability for males and females

THP Users Former Smokers Quitting THP (FC-FF)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	3.3	0.2	14.9
Female	8.8	0.4	36.8

THP Users Former Smokers Switching to Smoking Only (FC-CF)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	0.0		
Female	0.0		

The survey did not capture any direct switching to smoking only. It is hypothesised that this is included in the transition to dual use due to the definition of a former user requiring 12 months abstinence and zero transitions are assumed here.

Current Smokers Former THP Users Quitting Smoking (CF-FF)

Units: Percentage/Year

Annual Quit Probability		
Age Cohort	Male	Female
20-29	2.2%	5.4%
30-39	3.6%	3.0%
40-49	3.9%	3.1%
50-59	4.6%	4.6%
60-69	6.9%	6.2%
70-79	9.2%	9.9%
80+	9.1%	8.5%

The same quit probabilities are assumed as for Current Smokers that have never used THP

Current Smokers Former THP Users to Dual Use (CF-CC)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	9.8	7.5	12.6
Female	8.4	5.6	12.0

No survey data was captured on transition. The same transition probability as for CN to CC was assumed

Current Smokers Former THP Users to Dual Use (CF-FC)

Units: Percentage/Year

Gender	Weighted Percentage [%]	Lower Confidence Limit	Upper Confidence Limit
Male	0.4	0.1	13
Female	1.2	0.3	3.3

S2 Supplementary Outputs

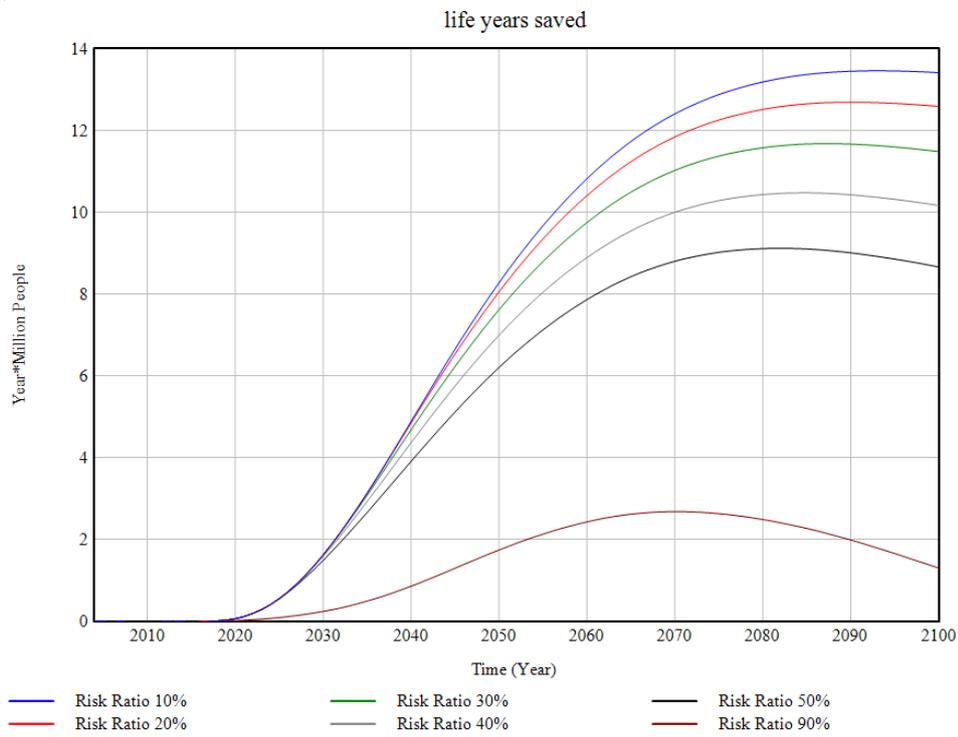


Figure S2. Projection of Life Years Saved for additive risk scenario with risk ratios between 10 -50% including 90% risk ratio.

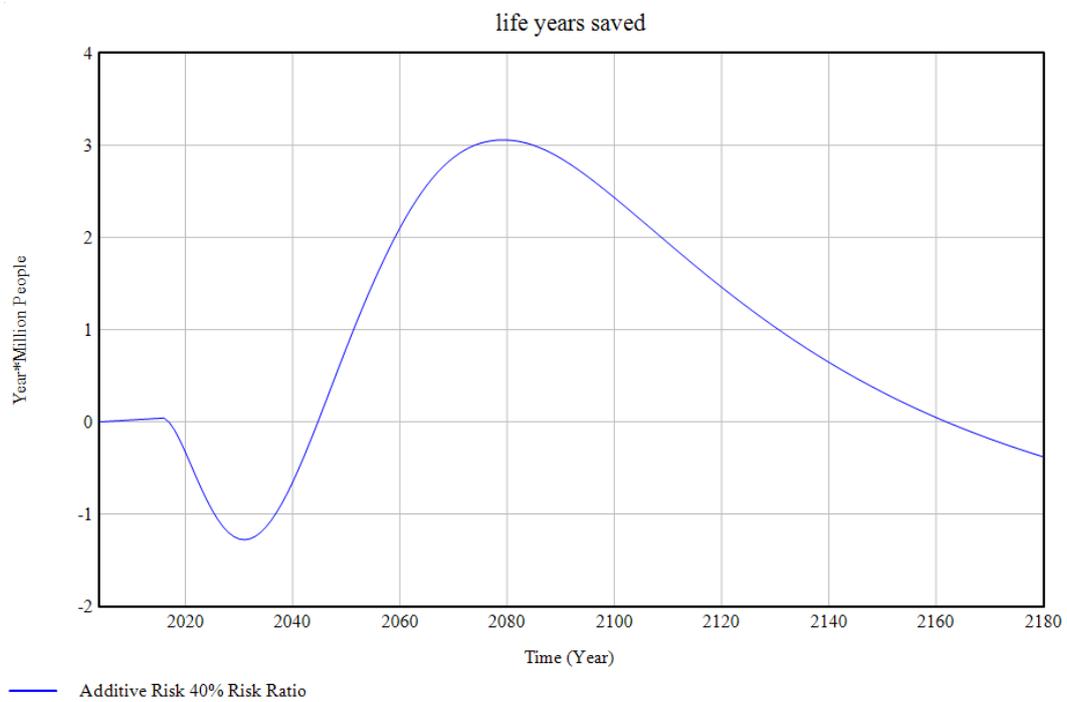


Figure S3. Life-years saved with 40% risk ratio in an additive scenario. It reaches tipping point at 2160