

Appendix

Coding of area-level data

Area-level socio-economic deprivation and rurality were derived by linking meshblock codes (containing approximately 60–120 residents) to addresses in the address notification table where available, otherwise domicile codes in the New Zealand Cancer Registry (NZCR), through a series of steps. These steps sought to obtain the meshblock of the address at the time of or closest in time to the date of diagnosis where possible. If the most recent meshblock pre- and post-diagnosis was the same, then this meshblock was used. Otherwise, if a meshblock was only available prior to or post-diagnosis, then this meshblock was used. If meshblocks pre- and post-diagnosis were known but differed, then the post-diagnosis meshblock was used if it was more recent and less than 2 months old, otherwise the meshblock prior

to diagnosis was used. Where no addresses were available in the address notification table, domicile codes in the NZCR were used.

Comparison of ethnicity sources

To assess whether Māori ethnicity might be undercounted in the NZCR, we compared Māori ethnicity records in the NZCR to those in the personal details table of the Integrated Data Infrastructure, which codes ethnicity based on the highest-quality data source available for a given individual. This comparison showed 3.6% (n=51) of Māori recorded in the personal details table were recorded as non-Māori in the NZCR (i.e., “missed”), whereas 10.6% (n=81) of Māori in the NZCR were recorded as non-Māori in the personal details table. This indicates that using the personal details table for ethnicity would result in a lower count of Māori than the NZCR.

Appendix Table 1: Missingness of disease-specific information for gastric cancer cohort (2002–2021) by year of diagnosis.

	Year of diagnosis																			
Disease specifics	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Number diagnosed each year	405	393	372	345	366	378	372	372	369	396	381	375	396	387	411	411	408	390	435	495
Gastric cancer site—unspecified																				
Number	123	114	96	99	126	135	147	111	123	132	138	123	63	99	96	84	87	78	102	102
Percent	30.4	29.0	25.8	28.7	34.4	35.7	39.5	29.8	33.3	33.3	36.2	32.8	15.9	25.6	23.4	20.4	21.3	20.0	23.4	20.6
Extent of disease—unknown																				
Number	138	144	126	117	126	153	150	156	153	165	171	174	177	177	204	195	189	195	216	237
Percent	34.1	36.6	33.9	33.9	34.4	40.5	40.3	41.9	41.5	41.7	44.9	46.4	44.7	45.7	49.6	47.4	46.3	50.0	49.7	47.9
Tumour grade—unknown																				
Number	174	198	174	150	141	174	156	123	114	144	150	132	141	123	147	108	132	129	147	180
Percent	43	50.4	46.8	43.5	38.5	46.0	41.9	33.1	30.9	36.4	39.4	35.2	35.6	31.8	35.8	26.3	32.4	33.1	33.8	36.4

Data correspond to Figure 1.

Appendix Table 2: Māori:non-Māori RR of death from gastric cancer within 1 year of a gastric cancer diagnosis across diagnosis periods, by age group.

	2002–2006			2007–2011			2012–2017		
	Māori:non-Māori RR			Māori:non-Māori RR			Māori:non-Māori RR		
	est.	95% CI		est.	95% CI		est.	95% CI	
Age group									
<45	1.15	0.70	1.89	1.13	0.69	1.85	1.01	0.59	1.73
45–64	1.29	0.97	1.70	1.10	0.82	1.46	1.08	0.81	1.41
65–84	1.04	0.80	1.34	0.95	0.73	1.23	1.08	0.85	1.36
85+	0.66	0.13	1.96	1.35	0.43	3.23	1.36	0.67	2.48

RR = rate ratio; est. = estimate; 95% CI = 95% confidence interval.

Appendix Table 3: Māori:non-Māori RR of death from gastric cancer within 1 year of a gastric cancer diagnosis across diagnosis periods, by NZDep, GCH, sex.

	2002–2006			2007–2011			2012–2017		
	Māori:non-Māori ASRR			Māori:non-Māori ASRR			Māori:non-Māori ASRR		
	est.	95% CI		est.	95% CI		est.	95% CI	
NZDep quintile									
1	1.14	0.46	2.62	1.13	0.28	3.22	0.88	0.32	2.23
2	1.97	0.58	5.53	1.17	0.51	2.65	1.26	0.54	2.72
3	1.22	0.61	2.33	1.05	0.53	2.02	0.98	0.36	2.35
4	1.12	0.57	2.26	1.20	0.61	2.35	0.96	0.48	1.97
5	1.13	0.71	1.84	0.97	0.59	1.62	0.95	0.55	1.69
GCH									
U1	1.33	0.91	1.92	1.08	0.74	1.56	0.90	0.59	1.36
U2	0.85	0.46	1.61	1.10	0.54	2.28	1.73	0.82	3.70
R1	0.67	0.25	1.85	1.61	0.69	3.90	0.71	0.25	2.70
R2–R3	0.94	0.30	4.17	0.69	0.15	6.86	0.85	0.22	4.69
Sex									
Female	1.08	0.71	1.67	0.85	0.55	1.32	1.01	0.64	1.57
Male	1.19	0.81	1.75	1.30	0.86	1.95	1.01	0.65	1.56

N=7,796.

RR = rate ratio; NZDep = New Zealand Index of Deprivation; GCH = Geographical Classification for Health; ASRR = age-standardised rate ratio; est. = estimate; 95% CI = 95% confidence interval.

Appendix Table 4: All-cause deaths within 1–5 years of gastric cancer diagnosis among Māori and non-Māori by age, including crude and age-standardised RR.

	Māori			Non-Māori			Māori:non-Māori RR		
	N	n	Crude rate	N	n	Crude rate	est.	95% CI	
Diagnosed with gastric cancer in 2002–2021 and died within 1 year of diagnosis									
<i>Age group</i>									
<45	261	120	46.0	330	141	42.7	1.08	0.83	1.37
45–64	594	297	50.0	1,776	741	41.7	1.20	1.05	1.37
65–84	564	336	59.6	3,498	1,890	54.0	1.10	0.98	1.24
85+	30	30	100.0	798	621	77.8	1.29	0.74	1.64
Total age standardised			49.8			45.0	1.11	0.96	1.28
Diagnosed with gastric cancer in 2002–2020 and died within 2 years of diagnosis									
<i>Age group</i>									
<45	249	144	57.8	300	171	57.0	1.01	0.80	1.27
45–64	555	366	65.9	1,659	957	57.7	1.14	1.01	1.29
65–84	531	387	72.9	3,270	2,220	67.9	1.07	0.96	1.20
85+	30	30	100.0	759	678	89.3	1.12	0.69	1.53
Total age standardised			62.5			59.4	1.05	0.92	1.20
Diagnosed with gastric cancer in 2002–2019 and died within 3 years of diagnosis									
<i>Age group</i>									
<45	234	141	60.3	282	174	61.7	0.98	0.78	1.23
45–64	525	378	72.0	1,572	1,014	64.5	1.12	0.99	1.26
65–84	495	390	78.8	3,069	2,295	74.8	1.05	0.94	1.17
85+	27	27	100.0	720	675	93.8	1.07	0.64	1.47
Total age standardised			66.5			64.8	1.03	0.90	1.17
Diagnosed with gastric cancer in 2002–2017 and died within 5 years of diagnosis									
<i>Age group</i>									
<45	213	135	63.4	237	159	67.1	0.94	0.74	1.19
45–64	459	351	76.5	1,392	972	69.8	1.10	0.97	1.25
65–8	441	378	85.7	2,727	2,193	80.4	1.07	0.96	1.20
85+	24	21	87.5	633	612	96.7	0.91	0.58	1.46
Total age standardised			69.9			69.7	1.00	0.88	1.15

N=7,851.

RR = rate ratio; est. = estimate; 95% CI = 95% confidence interval.

Appendix Table 5: All-cause deaths within 1–5 years of gastric cancer diagnosis among Māori and non-Māori by NZDep, GCH and sex, including crude and age-standardised RR.

	Māori			Non-Māori			Māori:non-Māori RR		Māori:non-Māori ASRR			
	N	n	Crude rate	N	n	Crude rate	est.	95% CI	est.	95% CI		
Diagnosed with gastric cancer in 2002–2021 and died within 1 year of diagnosis												
<i>NZDep quintile</i>												
1	90	42	46.7	1,140	573	50.3	0.93	0.67	1.27	0.98	0.59	1.58
2	132	72	54.5	1,263	597	47.3	1.14	0.88	1.46	1.25	0.81	1.91
3	195	111	56.9	1,311	717	54.7	1.04	0.84	1.27	1.15	0.80	1.63
4	309	171	55.3	1,353	765	56.5	0.97	0.82	1.15	1.16	0.85	1.59
5	717	384	53.6	1,281	720	56.2	0.95	0.84	1.08	1.02	0.80	1.30
<i>GCH</i>												
U1	648	333	51.4	3,942	2,010	51.0	1.01	0.89	1.13	1.06	0.88	1.28
U2	390	207	53.1	1,164	663	57.0	0.93	0.79	1.09	1.12	0.79	1.60
R1	210	117	55.7	819	462	56.4	1.00	0.81	1.22	1.17	0.77	1.84
R2–R3	198	123	62.1	426	237	55.6	1.11	0.89	1.39	0.99	0.52	2.05
<i>Sex</i>												
Female	627	321	51.2	2,232	1,236	55.4	0.92	0.81	1.04	1.07	0.87	1.33
Male	825	462	56.0	4,167	2,154	51.7	1.08	0.98	1.20	1.13	0.93	1.38
Diagnosed with gastric cancer in 2002–2020 and died within 2 years of diagnosis												
<i>NZDep quintile</i>												
1	87	54	62.1	1,065	678	63.7	0.94	0.70	1.25	1.02	0.65	1.55
2	126	93	73.8	1,170	738	63.1	1.17	0.93	1.45	1.30	0.88	1.89
3	180	129	71.7	1,233	843	68.4	1.04	0.86	1.25	1.10	0.79	1.51
4	291	195	67.0	1,281	909	71.0	0.94	0.80	1.10	0.97	0.73	1.30
5	675	456	67.6	1,197	837	69.9	0.96	0.86	1.08	0.97	0.78	1.22
<i>GCH</i>												
U1	609	393	64.5	3,672	2,370	64.5	1.00	0.90	1.11	1.01	0.85	1.20
U2	366	252	68.9	1,095	801	73.2	0.94	0.81	1.08	1.03	0.76	1.41
R1	201	138	68.7	771	549	71.2	0.96	0.79	1.16	1.12	0.76	1.69
R2–R3	186	141	75.8	405	288	71.1	1.07	0.87	1.31	1.06	0.58	2.04
<i>Sex</i>												
Female	591	387	65.5	2,088	1,422	68.1	0.96	0.86	1.08	1.06	0.87	1.29

Appendix Table 5 (continued): All-cause deaths within 1–5 years of gastric cancer diagnosis among Māori and non-Māori by NZDep, GCH and sex, including crude and age-standardised RR.

	Māori			Non-Māori			Māori:non-Māori RR			Māori:non-Māori ASRR		
	N	n	Crude rate	N	n	Crude rate	est.	95% CI		est.	95% CI	
Male	774	537	69.4	3,903	2,604	66.7	1.04	0.94	1.14	1.05	0.88	1.26
Diagnosed with gastric cancer in 2002–2019 and died within 3 years of diagnosis												
<i>NZDep quintile</i>												
1	84	54	64.3	987	693	70.2	0.94	0.70	1.24	1.07	0.69	1.63
2	120	93	77.5	1,107	780	70.5	1.11	0.89	1.38	1.24	0.85	1.80
3	171	132	77.2	1,161	876	75.5	1.03	0.85	1.24	1.01	0.73	1.39
4	276	198	71.7	1,212	933	77.0	0.93	0.80	1.09	0.93	0.70	1.25
5	630	459	72.9	1,125	852	75.7	0.96	0.85	1.07	0.98	0.79	1.22
<i>GCH</i>												
U1	564	396	70.2	3,453	2,457	71.2	0.98	0.88	1.10	0.99	0.84	1.18
U2	342	249	72.8	1,041	816	78.4	0.93	0.80	1.07	1.02	0.75	1.38
R1	195	147	75.4	720	561	77.9	0.97	0.81	1.17	1.05	0.72	1.56
R2–R3	177	141	79.7	384	300	78.1	1.01	0.82	1.24	1.04	0.56	2.12
<i>Sex</i>												
Female	564	396	70.2	1,965	1,467	74.7	0.94	0.84	1.06	1.01	0.84	1.23
Male	720	543	75.4	3,672	2,688	73.2	1.03	0.93	1.13	1.03	0.86	1.23
Diagnosed with gastric cancer in 2002–2017 and died within 5 years of diagnosis												
<i>NZDep quintile</i>												
1	78	57	73.1	855	648	75.8	0.97	0.72	1.27	1.04	0.68	1.57
2	108	84	77.8	984	741	75.3	1.06	0.83	1.32	1.09	0.73	1.61
3	156	123	78.8	1,056	855	81.0	0.99	0.81	1.20	0.96	0.68	1.33
4	243	186	76.5	1,068	882	82.6	0.93	0.79	1.09	0.90	0.67	1.22
5	549	432	78.7	981	789	80.4	0.98	0.87	1.10	1.01	0.80	1.27
<i>GCH</i>												
U1	498	375	75.3	3,048	2,334	76.6	0.98	0.88	1.09	0.99	0.83	1.18
U2	303	240	79.2	924	765	82.8	0.94	0.81	1.09	1.02	0.75	1.39
R1	171	141	82.5	639	528	82.6	0.99	0.82	1.20	0.92	0.61	1.40

Appendix Table 5 (continued): All-cause deaths within 1–5 years of gastric cancer diagnosis among Māori and non-Māori by NZDep, GCH and sex, including crude and age-standardised RR.

	Māori			Non-Māori			Māori:non-Māori RR			Māori:non-Māori ASRR		
	N	n	Crude rate	N	n	Crude rate	est.	95% CI		est.	95% CI	
R2–R3	159	132	83.0	333	285	85.6	0.98	0.79	1.21	0.82	0.44	1.69
Sex												
Female	498	372	74.7	1,752	1,383	78.9	0.95	0.84	1.06	0.98	0.81	1.20
Male	636	516	81.1	3,240	2,550	78.7	1.03	0.93	1.13	1.02	0.85	1.22

N=7,796.

NZDep = New Zealand Index of Deprivation; GCH = Geographical Classification for Health; RR = rate ratio; ASRR = age-standardised rate ratio; est. = estimate; 95% CI = 95% confidence interval.

Appendix Table 6: Māori:non-Māori RR for all-cause mortality within 1 year of a gastric cancer diagnosis across diagnosis periods, by age group.

	2002–2006			2007–2011			2012–2016			2017–2021		
	Māori:non-Māori RR			Māori:non-Māori RR			Māori:non-Māori RR			Māori:non-Māori RR		
	est.	95% CI		est.	95% CI		est.	95% CI		est.	95% CI	
Age group												
<45	1.11	0.69	1.79	1.07	0.65	1.73	0.98	0.54	1.75	1.03	0.59	1.76
45–64	1.24	0.94	1.62	1.07	0.80	1.40	1.11	0.83	1.47	1.46	1.10	1.93
65–84	1.00	0.77	1.28	1.00	0.78	1.27	1.07	0.84	1.35	1.39	1.10	1.75
85+	0.63	0.13	1.86	1.42	0.51	3.17	1.20	0.57	2.27	1.17	0.52	2.27

N=7,851

RR = rate ratio; est. = estimate; 95% CI = 95% confidence interval.

Appendix Table 7: Māori:non-Māori ASRR for all-cause mortality within 1 year of a gastric cancer diagnosis across diagnosis periods, by NZDep quintiles, GCH and sex.

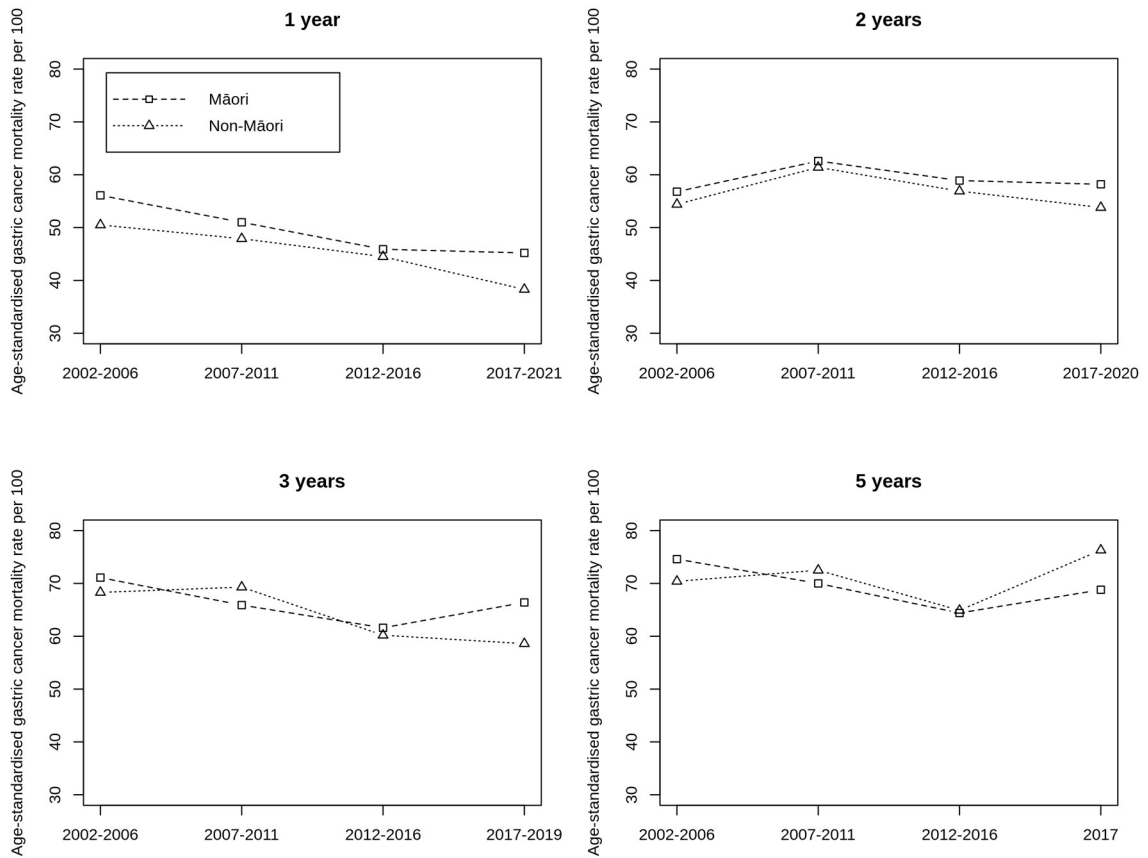
	2002–2006			2007–2011			2012–2016			2017–2021		
	Māori:non-Māori ASRR			Māori:non-Māori ASRR			Māori:non-Māori ASRR			Māori:non-Māori ASRR		
	est.	95% CI		est.	95% CI		est.	95% CI		est.	95% CI	
NZDep quintile												
1	0.99	0.42	2.18	1.10	0.28	3.12	1.16	0.40	3.09	0.39	0.15	1.81
2	1.94	0.60	5.27	1.13	0.50	2.51	1.22	0.50	2.73	0.79	0.27	2.06
3	1.18	0.60	2.22	1.14	0.61	2.11	0.93	0.35	2.26	1.23	0.51	2.73
4	1.06	0.56	2.05	1.01	0.53	1.91	0.82	0.40	1.70	1.90	0.99	3.66
5	1.15	0.73	1.84	0.94	0.59	1.54	0.97	0.55	1.74	0.93	0.57	1.54
GCH												
U1	1.28	0.89	1.83	1.02	0.71	1.47	0.87	0.56	1.34	1.01	0.68	1.47
U2	0.77	0.42	1.42	1.09	0.55	2.16	2.17	0.99	4.86	1.09	0.46	2.61
R1	0.75	0.30	1.86	1.61	0.72	3.71	0.56	0.20	2.01	2.34	0.96	6.31
R2–R3	0.95	0.31	4.03	0.69	0.16	6.43	0.85	0.23	4.46	0.62	0.21	6.48
Sex												
Female	1.05	0.70	1.59	0.85	0.56	1.31	0.91	0.57	1.44	1.45	0.91	2.29
Male	1.14	0.79	1.66	1.23	0.82	1.80	1.08	0.68	1.69	0.99	0.65	1.49

N=7,796 due to missing domicile/NZDep/GCH.

Age-standardisation based on 0–44, 45–64 and 65+ age groups.

ASRR = age-standardised rate ratio; NZDep = New Zealand Index of Deprivation; GCH = Geographical Classification for Health; est. = estimate; 95% CI = 95% confidence interval.

Appendix Figure 1: Age-standardised all-cause mortality rates for Māori and non-Māori up to 5 years following diagnosis with gastric cancer in different periods.



Appendix Figure 2: Age-standardised gastric cancer-caused mortality rates for Māori and non-Māori up to 5 years following diagnosis with gastric cancer in different periods.

