

**Supplementary Table 1. Baseline input parameter table used in modelling dietary counselling for weight loss**

Baseline input Parameter	Source and application to model	Expected Value and 95% UI	Distribution
Baseline population count	Statistics NZ (SNZ) population estimates for 2011.	Nil uncertainty.	
All-cause mortality rates	SNZ mortality rates for 2011.	Nil uncertainty.	
Disease-specific incidence, prevalence, and case-fatality rates (and remission rates)	For each disease, coherent sets of incidence rates, prevalence, case-fatality rates (CFR), and remission rates (zero for non-cancers, the complement of the CFR for cancers to give the expected 5-y relative survival) were estimated using DISMOD II using data from NZBDS, HealthTracker and the Ministry of Health.	Uncertainty: rates all +/- 5% standard deviation (SD).	Log-normal
Disease trends	Trends are applied to incidence, case-fatality and remission. These are switched on until 2026 and then kept constant for the remainder of the lifetime.	Uncertainty: +/- 0.5% absolute change. Diabetes: Uncertainty +/- 1.5% absolute change.	Normal
Total morbidity per capita in 2011	The per capita rate of years of life lived with disability (YLD) from the NZBDS.	Uncertainty: +/- 10% SD.	Log-normal
Disease morbidity rate per capita	Each disease was assigned a disability rate (DR; by sex and age) equal to YLDs for that disease (scaled down to adjust for comorbidities) from the 2006 NZBDS projected forward to 2011, divided by the disease prevalence. This DR was assigned to the proportion of the cohort in each disease state.	Uncertainty: +/- 10% SD.	Normal
Health system costs	Linked health data (hospitalisations, inpatient procedures, outpatients, pharmaceuticals, laboratories, and expected primary care usage) for each individual in NZ for the period 2006–2010 had unit costs assigned to each event, and then five health system costs (2011 NZ\$) were estimated.	Estimated at SD = $\pm 10\%$ of the point estimate.	Gamma
Timelags	It takes time for a change in BMI to impact on disease incidence. As there are no data on just how long these are we have used wide windows for timelags. For cancers the timelag was assumed to range between 10 and 30 years. For CHD, Stroke, diabetes and osteoarthritis, the non-cancers, the timelag was assumed to be shorter and ranges between 0 and 5 years. Wide uncertainty is included in these estimates.	Uncertainty: +/- 20% SD about each of minimum (10) and maximum (30) with no correlation	Normal
BMI TMREL	The Theoretical Minimum Risk Exposure Level (TMREL) is the level of risk exposure at which the dose response ceases. For BMI, a TMREL of between 21 and 23 was used from the latest Global Burden of Disease study <sup>(1)</sup> .		Uniform
Adult height	Mean and SD of height from NZ Adult Nutrition Survey 2008/09 <sup>(2)</sup>	Uncertainty using reported SD.	Normal

**Supplementary Table 2. Intervention input parameter table used in modelling dietary counselling for weight loss**

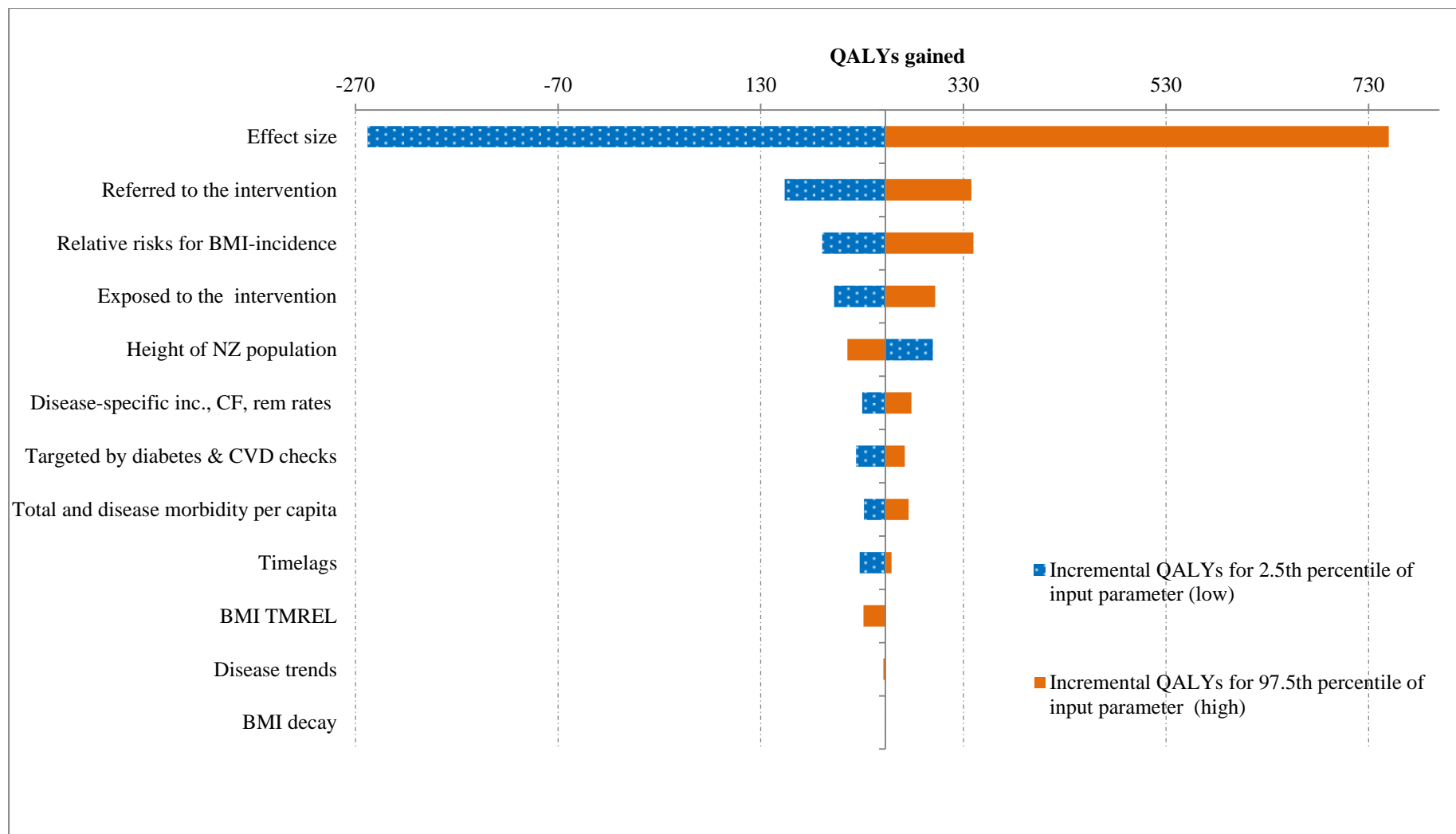
<b>Intervention Input Parameters</b>	<b>Source and application to model</b>	<b>Expected Value and 95% UI</b>	<b>Distribution</b>
Effect size	Weight loss in the intervention arm of the review had an average non-significant weight loss of $-0.45$ kg (95% CI $-1.34$ to $0.43$ ) <sup>(3)</sup> at 12 months. Due to the average contact time in the meta-analysis being more than that in the modelled intervention the effect size was scaled down. Using the original effect sizes in the 5 included studies an average per minute weight decrease was calculated and then multiplied by 120 minutes to give an effect size of $-0.34$ kg.	$-0.34$ kg (95% CI: $-1.01$ to $0.32$ ).	Normal
Decay in BMI change post-intervention	Modeled BMI reduction decays back to the pre-intervention BMI at a rate of $0.03$ units per month returning to approximately baseline levels the year after the intervention. <sup>(4)</sup>	24% per year Uncertainty $\pm 20\%$ SD.	Exponential
Those targeted by diabetes and CVD check	90% of those eligible for a Diabetes and CVD check are captured through this programme: <sup>(5)</sup> Targets overweight and obese adults over 35 years (Māori men), 45 (Māori women and Non-Māori men) and 55 (Non-Māori women) in the model.	95% UI: 80% - 97%	Beta
Those referred to the intervention	60% of the above were assumed to be referred by GPs to practice nurses <sup>(6)</sup>	95% UI: 35% - 82%	Beta
Those exposed to the intervention	49.4% of the above are likely to take up the intervention <sup>(7)</sup>	95% UI: 40% - 59%	Beta
Intervention costs	Total intervention costs were 2011 NZ\$ 38 291 968 for individual dietary counselling (See Table 1 in main text for details).	Modelled uncertainty set at 20% of the mean	Gamma
Relative risks for risk factors and disease incidence	See Supplementary table 3 and 4 for disease specific relative risks.		

**Supplementary Table 3. Relative risks of BMI-related diseases (non-cancers) from the Global Burden of Disease Study (for males and females, per 5 BMI units) <sup>(1)</sup>**

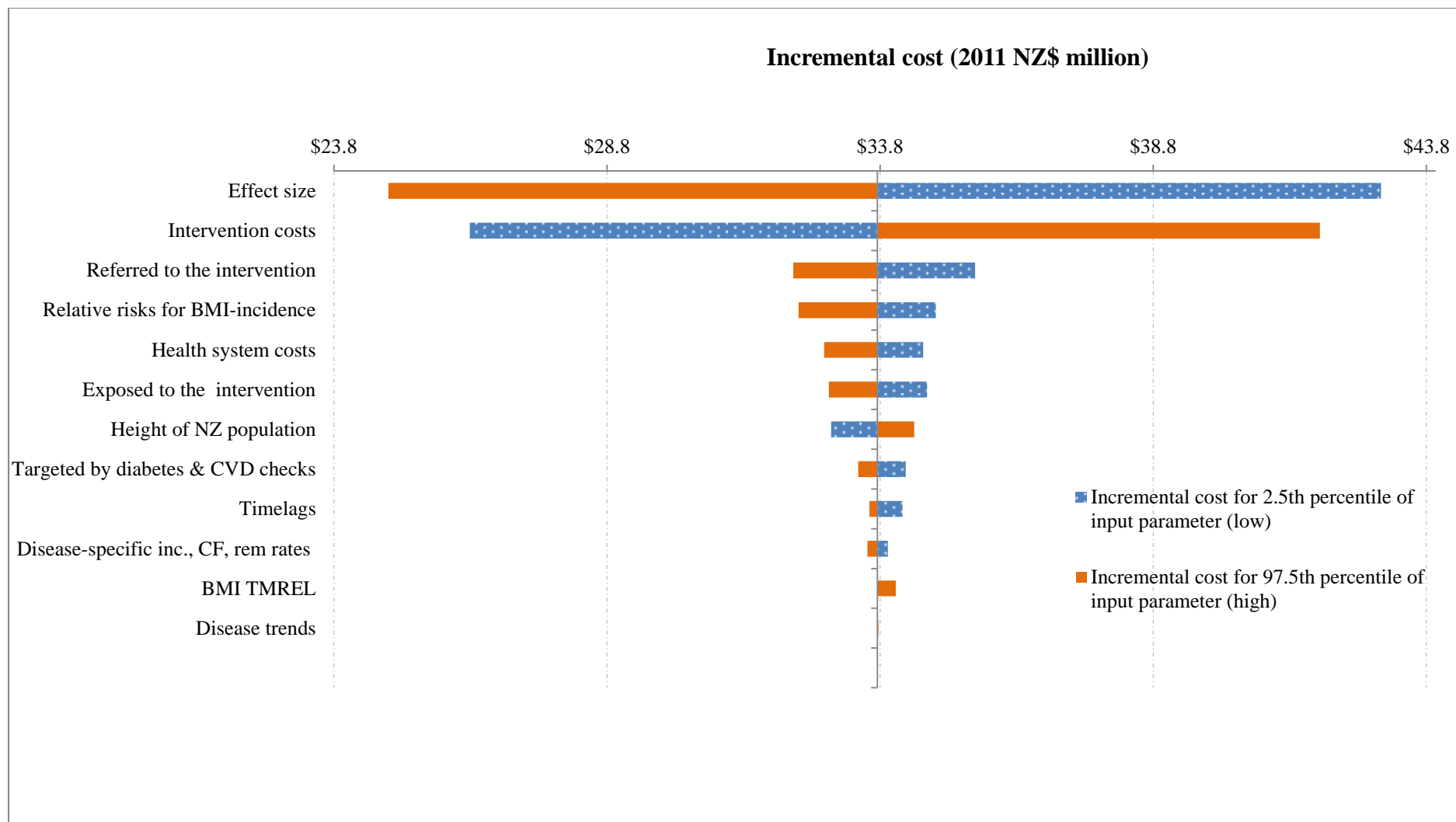
	<b>Age-group</b>	<b>CHD</b>	<b>Stroke</b>	<b>Type 2 diabetes</b>	<b>Osteoarthritis (knee &amp; hip combined)</b>
Male	25-29	2.274 (1.252 - 3.686)	2.620 (1.486 - 4.318)	3.546 (2.300 - 5.227)	1.677 (1.388 - 2.021)
	30-34	2.018 (1.291 - 3.107)	2.404 (1.547 - 3.599)	3.455 (2.500 - 4.692)	1.568 (1.305 - 1.882)
	35-39	1.724 (1.531 - 1.934)	2.134 (1.760 - 2.581)	3.349 (2.801 - 3.918)	1.592 (1.328 - 1.919)
	40-44	1.599 (1.417 - 1.785)	1.985 (1.675 - 2.337)	3.160 (2.689 - 3.700)	1.576 (1.312 - 1.876)
	45-49	1.567 (1.455 - 1.681)	1.862 (1.646 - 2.114)	2.864 (2.450 - 3.318)	1.510 (1.275 - 1.798)
	50-54	1.520 (1.416 - 1.631)	1.732 (1.518 - 1.964)	2.624 (2.222 - 3.038)	1.504 (1.265 - 1.797)
	55-59	1.466 (1.372 - 1.558)	1.599 (1.468 - 1.740)	2.417 (2.084 - 2.781)	1.521 (1.288 - 1.814)
	60-64	1.414 (1.324 - 1.505)	1.496 (1.363 - 1.637)	2.215 (1.866 - 2.611)	1.543 (1.294 - 1.830)
	65-69	1.364 (1.286 - 1.448)	1.406 (1.321 - 1.499)	2.046 (1.724 - 2.388)	1.558 (1.296 - 1.866)
	70-74	1.319 (1.241 - 1.400)	1.323 (1.238 - 1.411)	1.896 (1.596 - 2.229)	1.558 (1.301 - 1.883)
	75-79	1.274 (1.187 - 1.365)	1.239 (1.160 - 1.328)	1.740 (1.445 - 2.087)	1.558 (1.290 - 1.861)
80+	1.170 (1.090 - 1.252)	1.069 (1.000 - 1.157)	1.461 (1.207 - 1.762)	1.588 (1.320 - 1.925)	
Female	25-29	2.274 (1.252 - 3.686)	2.717 (1.543 - 4.538)	3.546 (2.300 - 5.227)	1.496 (1.285 - 1.748)
	30-34	2.018 (1.291 - 3.107)	2.514 (1.614 - 3.772)	3.455 (2.500 - 4.692)	1.466 (1.251 - 1.722)
	35-39	1.724 (1.531 - 1.934)	2.234 (1.806 - 2.754)	3.349 (2.801 - 3.918)	1.460 (1.255 - 1.712)
	40-44	1.599 (1.417 - 1.785)	2.035 (1.699 - 2.419)	3.160 (2.689 - 3.700)	1.501 (1.272 - 1.761)
	45-49	1.567 (1.455 - 1.681)	1.837 (1.633 - 2.072)	2.864 (2.450 - 3.318)	1.496 (1.268 - 1.776)
	50-54	1.520 (1.416 - 1.631)	1.761 (1.530 - 2.015)	2.624 (2.222 - 3.038)	1.541 (1.284 - 1.856)
	55-59	1.466 (1.372 - 1.558)	1.621 (1.480 - 1.775)	2.417 (2.084 - 2.781)	1.566 (1.313 - 1.886)
	60-64	1.414 (1.324 - 1.505)	1.502 (1.366 - 1.649)	2.215 (1.866 - 2.611)	1.565 (1.306 - 1.865)
	65-69	1.364 (1.286 - 1.448)	1.411 (1.323 - 1.507)	2.046 (1.724 - 2.388)	1.575 (1.304 - 1.892)
	70-74	1.319 (1.241 - 1.400)	1.323 (1.238 - 1.413)	1.896 (1.596 - 2.229)	1.562 (1.303 - 1.889)
	75-79	1.274 (1.187 - 1.365)	1.237 (1.159 - 1.322)	1.740 (1.445 - 2.087)	1.555 (1.288 - 1.856)
80+	1.170 (1.090 - 1.252)	1.069 (1.000 - 1.160)	1.461 (1.207 - 1.762)	1.562 (1.305 - 1.882)	

**Supplementary Table 4. Relative risks of BMI-related cancers from the Global Burden of Disease Study (per 5 BMI units) <sup>(1)</sup>**

		<b>Kidney cancer</b>	<b>Liver cancer</b>	<b>Oesophageal cancer</b>	<b>Pancreatic cancer</b>	<b>Thyroid cancer</b>	<b>Colorectal cancer</b>	<b>Gallbladder cancer</b>	<b>Endometrial Cancer</b>	<b>Breast cancer</b>	<b>Ovarian cancer</b>
Males	All ages	1.24 (1.17 - 1.31)	1.29 (1.11 - 1.49)	1.39 (1.08 - 1.76)	1.07 (1.00 - 1.15)	1.22 (1.07 - 1.38)	1.18 (1.15 - 1.21)	1.16 (1.03 - 1.28)	NA	NA	NA
Females	All ages	1.32 (1.25 - 1.40)	1.18 (1.03 - 1.34)	1.35 (1.01 - 1.75)	1.09 (1.04 - 1.14)	1.14 (1.09 - 1.18)	1.06 (1.03 - 1.08)	1.34 (1.22 - 1.48)	1.61 (1.54 - 1.68)	1.02 (1.02 - 1.03)	1.04 (1.00 - 1.08)



**Supplementary figure 1 Tornado plot showing the major drivers of uncertainty in the health gain (in QALYs) for the population as a result of individual dietary counselling (inc: incidence, CF: case fatality, rem: remission, TMREL: theoretical minimum risk exposure level)**



**Supplementary figure 2 Tornado plot showing the major drivers of uncertainty in the health system costs (in 2011 NZ\$ in millions) for the population as a result of individual dietary counselling (inc: incidence, CF: case fatality, rem: remission, TMREL: theoretical minimum risk exposure level)**

## References

1. Forouzanfar MH, Alexander L, Anderson HR *et al.* (2015) Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet* **386**, 2287-2323.
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7. Wee CC, Davis RB, Phillips RS (2005) Stage of readiness to control weight and adopt weight control behaviors in primary care. *J Gen Intern Med* **20**, 410-415.