Estimated alcohol-attributable health burden in Aotearoa New Zealand:

Supplementary Methods

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Definition of conditions and condition mapping

Our analysis included 26 health conditions associated with individuals' alcohol use, categorised into six groups. Condition definitions used for the analysis were aligned with how the conditions had been defined by the Global Burden of Disease Study (GBD) 2016 relative risks.[1]

Data used for the analysis were processed and checked to ensure alignment between health loss outcome measures (deaths, hospitalisations, etc) and the relative risks. For example, checking that the International Classification of Diseases (ICD) codes categorised as oesophageal cancer in the Ministry of Health | Manatū Hauora mortality data were the same as the ICD codes used by GBD to define oesophageal cancer when estimating relative risks.

Overall, there was good concordance between the GBD condition definitions and the format of data in the publicly accessible mortality[2] and hospitalisation[3] datasets for Aotearoa-New Zealand (see Appendix 1 for mapping of ICD codes in dataset to conditions). Cancer registration counts were extracted from unit record data to align with GBD definitions. All ICD codes in the hospitalisation and mortality datasets were also categorised into condition groups to enable calculation of the percentage of deaths and hospitalisations in condition groups that were attributable to alcohol (e.g. the percentage of all cancer deaths attributable to alcohol) (see Appendix 2 for mapping). There were four conditions where further processing of mortality and hospitalisation data was required to produce health loss counts that were concordant with GBD condition definitions: ischaemic stroke, haemorrhagic stroke, alcoholic cardiomyopathy, and alcoholic gastritis.

For ischaemic stroke and haemorrhagic stroke, counts were based on disaggregating the overall count of stroke deaths and hospitalisations. This was required due to the number of stroke deaths and hospitalisations where the sub-type was not specified. We used findings from the Auckland Regional Community Stroke Study[4], a population-based register of all new strokes in Auckland, to determine the proportion of stroke deaths and hospitalisations that were ischaemic and haemorrhagic. Of 1,643 strokes in ARCOS-IV (2011-12), there were 1329 ischaemic strokes, 290 haemorrhagic strokes, and 24 where the sub-type was unknown. Assuming that the unknown strokes (1.5%) are proportionally distributed across ischaemic and haemorrhagic, this gives the proportion of strokes that are ischaemic and haemorrhagic as 82% and 18% respectively. We applied these proportions to age, sex, and ethnicity specific counts of stroke deaths and hospitalisations to give the counts of ischaemic and haemorrhagic strokes for the analysis. We note that we assume that the distribution of stroke sub-types in ARCOS-IV is representative of the distribution of stroke sub-types nationally and has remained unchanged overtime.

For alcoholic cardiomyopathy and alcoholic gastritis, health loss counts were available for the broader condition (i.e. cardiomyopathy and gastritis, ICD-10-AM codes I42 and K29, respectively). To avoid issues with small number fluctuations in any one particular year, we used unit record level data from the Manatū Hauora National Minimum Dataset and Mortality collections to estimate the proportion of cardiomyopathy and gastritis deaths and hospitalisations over a five-year period that were specific to alcohol (ICD-10-AM code I426 for alcohol cardiomyopathy and K292 for alcoholic gastritis), by age, sex, and ethnicity. These proportions were applied to cardiomyopathy and gastritis counts in the publicly available mortality and publicly funded hospitalisation datasets to give the health loss counts used for the analysis.

Processing of publicly available hospitalisation data

This section outlines the steps taken to process the publicly accessible hospitalisation data to generate counts of hospitalisations for the analysis.

Manatū Hauora provides data on publicly funded hospital discharges (hospitalisations henceforth) by age, sex, and ethnicity for each financial year. We used data for the 2017/18 financial year for this analysis. Manatū Hauora provides two datasets – one containing all hospitalisations by primary diagnosis ('DischargesAll'), and one containing injury-related hospitalisations categorised by external code ('DischargesInjury'). Primary diagnosis codes for injuries relate to the nature of the injury sustained (e.g. 'open wound of head') whilst external codes relate to how the injury happened (e.g. 'fall on and from stairs and steps'). External codes are used to classify injuries for the GBD relative risks and therefore it was necessary to combine the datasets available from Manatū Hauora so that injuries were classified by external cause rather than primary diagnosis.

The 'DischargesAll' dataset includes hospitalisations recorded in 'DischargesInjury'. To avoid double counting hospitalisations, we made exclusions from both the 'DischargesAll' and 'DischargesInjury' datasets prior to combining (see Figure 1). First, hospitalisations in under 15 year-olds were excluded from both datasets. Next, injury-specific codes were excluded from 'DischargesAll' and treatment-related codes were excluded from 'DischargesInjury' (see Appendix 3 for full list of ICD codes). These datasets were then combined to give the analytic sample for this project. Exclusions were informed by cross-tabulations of 2017/18 hospitalisations by primary diagnosis and external code conducted on unit-level hospitalisation data with minimal prior processing applied.
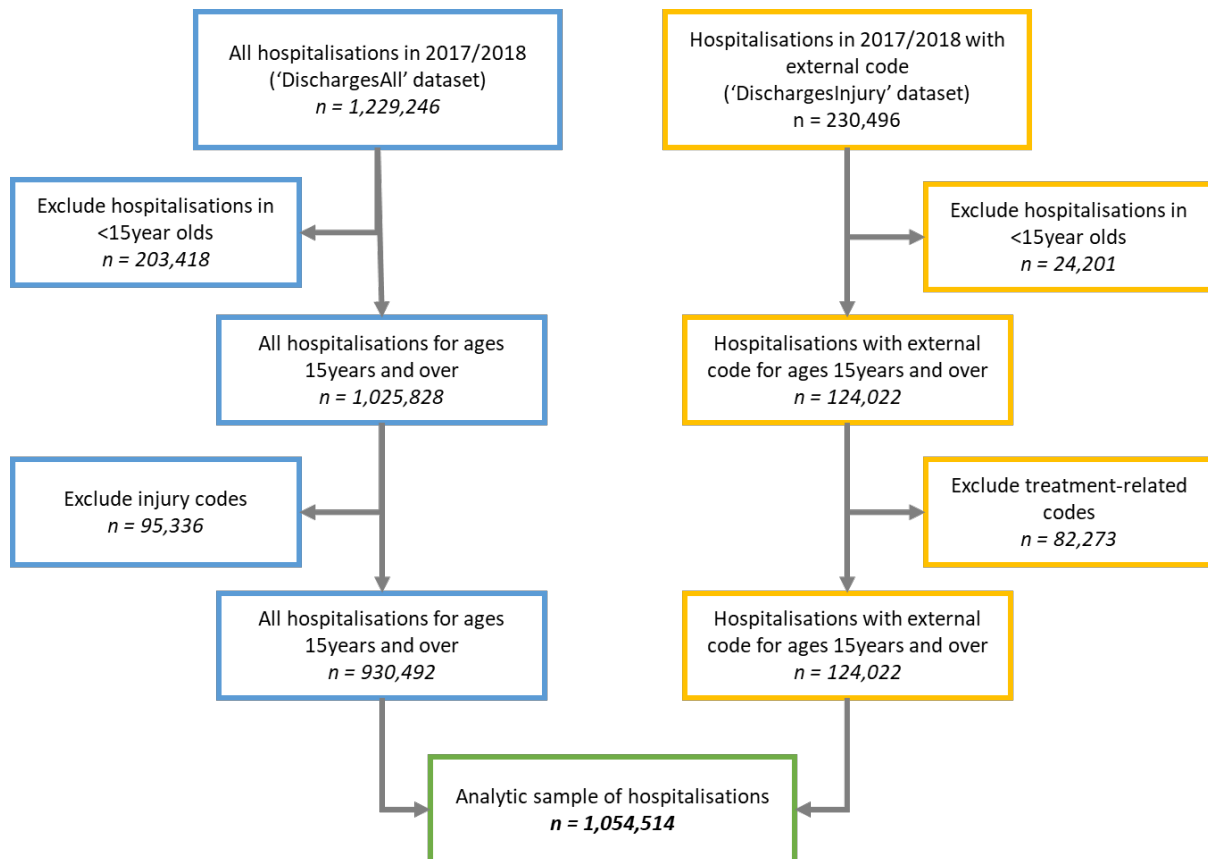
Figure 1. Flow diagram illustrating how analytic sample of hospitalisations was obtained

The analytic sample contained 28,686 more hospitalisations for ages 15 years and over than the original hospitalisation dataset from Manatū Hauora. This represents a 2.8% double count of hospitalisations in our sample relative to the actual number of hospitalisations in the 2017/18 financial year. Based on our cross-tabulations of hospitalisations by primary and external cause, there are three issues contributing to the majority of double counting in our analytic sample:

1) Hospitalisations with a non-specific primary diagnosis code and an external code. This captures instances of injury events falling under non-specific or treatment-related primary codes such as 'Z03 Medical observation and evaluation for suspected diseases and conditions', 'Z54 Convalescence', and 'Z50 Care involving the use of rehabilitation procedures'. This likely contributes to the bulk of double counting in our analytic sample. Based on our cross-tabulations, exclusion of these codes would be likely to result in a substantial undercount as many hospitalisations falling under these codes did not have an external code.
2) Hospitalisations resulting from medical issues relating to an external cause event. This captures where the primary diagnosis does not fall under an injury-specific ICD code such as instances where the primary code was 'L03 Cellulitis' (skin inflammation/infection) or 'R55 Syncope and collapse' (fainting). Based on our cross-tabulations, exclusion of these codes would also likely result in a substantial undercount as these primary diagnoses can also result from causes unrelated to injuries.
3) Co-occurrence of medical events with external cause events. This captures instances where a medical event co-occurs with an external cause event (e.g. primary diagnosis is 'I63 Cerebral infarction' with external cause code 'W19 Unspecified fall'). Based on our cross-tabulations this is likely to be a minor contributor to double counting in our analysis. Exclusion of either the primary diagnosis or external cause codes would result in a substantial undercount of hospitalisations as these co-occurrence events are rare relative to the prevalence of the primary diagnosis and external cause codes.

Further efforts to reduce double counting of hospitalisations would require a custom analysis of the individual-level hospitalisation data and include ordering codes according to priority (i.e. deciding whether co-occurrence of cerebral infarction and fall should be coded as one or the other). This was beyond the scope of this project. Given that the over-count of hospitalisations was small (2.8%), the level of bias introduced by double counting hospitalisations is likely to be minor.

Injury mapping for Accident Compensation Corporation claims data

The Accident Compensation Corporation (ACC) coding of claims does not include information on the equivalent ICD codes and therefore custom mapping of claims to GBD condition categories was required. Counts of claims for the 2017/18 financial year by injury type (transport injuries, self-harm, interpersonal violence, and unintentional injuries) were provided to the authors by ACC. This section details the methods used to compile ACC claim counts for this analysis.

ACC is a Crown entity responsible for delivering an accident insurance scheme in Aotearoa New Zealand.[5] A claim is a request for ACC to help cover the costs of medical bills, treatment, help at home and work, and help with income. It does not reflect injuries for which an ACC claim is not filed (minor injuries where no treatment is sought). Claims are assigned to one of five accounts; motor vehicle (injuries on a public road involving a moving motor vehicle); work (work-related injuries); earners' (non-work injuries to people in employment); treatment injury (injuries that are caused by, or happen during treatment); and non-earners' (injuries not covered in other accounts to people not in employment).[5]

The claims counts provided by ACC to the authors included the majority of all claims (89%, n = 1,455,000/1,636,000) made in the 2017/18 financial year. Four claim categories were excluded from the analysis (see Table 1) due to not being relevant or there being insufficient detail on claims in a category to permit inclusion.

Table 1. Accident Compensation Corporation injury claims excluded from the analysis

Claim type	Description	Count	Percentage of total claims	Reason for exclusion
Accredited Employers Programme Claims	Claims managed by an ACC accredited employer – from the 'Work Account'	30,000	2%	Insufficient claim level data for analysis – claim payment made directly to employer to the individual.
Public Health Acute Services	Accidental injury costs from acute inpatient, emergency department and outpatient care, pharmaceuticals, care for complex burns and laboratory services	100,000	6%	Insufficient claim level data for analysis – payment made directly to health service (e.g. DHB) rather than to individual.
Work related gradual process claims	Claims that result from ongoing exposure to an element in the workplace (e.g. asbestos or noise) – from the 'Work Account'	37,000	2%	Not relevant
Treatment Injury claims	Injuries caused by treatment delivered in District Health Boards, private hospitals and in general practice settings – from the 'Treatment Injury Account'	14,000	1%	Not relevant

The following steps were used to classify the remaining ACC claims into their respective GBD condition categories:

1) Claims paid from the Motor Vehicle Account were classified as transport injuries
2) Claims classified by ACC as sensitive claims were coded to interpersonal violence
3) Read codes were used to code remaining claims to interpersonal violence and self-harm (see Appendix 4 for condition mapping)
4) All remaining claims were classified as unintentional injuries

This process was informed by inspecting the ICD codes used to estimate GBD relative risk of injuries. However, we note that due to differences in the classification systems used, there is likely to be some mismatch of claims to specific injury conditions. For example, the motor vehicle account captures transport injuries involving a motor vehicle, but the GBD definition additionally captures transport injuries where motor vehicles are not involved (e.g. Pedal cyclist injured in collision with fixed or stationary object). Overall, the process of classifying claims into their respective conditions is likely to overestimate unintentional injuries and underestimate other injury types. Where the alcohol attributable fraction is lower for unintentional injuries than other injury types, the impact is likely to be an underestimate of the number of alcohol attributable claims, and vice versa if the AAF was higher for unintentional injuries.

Data provided to the authors disaggregated claims by ethnicity, sex, and age group, and additionally by whether the claim related to a fatal or non-fatal injury. Claims counts under 6 were coded as "<6", and subsequently recoded to zero by the authors. We note that this is likely to result in a slight

undercount in both the total number of claims, and alcohol attributable claims. We combined counts from fatal and non-fatal injuries to give the overall claim counts used for the analysis.

Cancer registrations

Publicly available data on cancer registrations for 2018 were not disaggregated into the same categories as the AAFs and therefore we extracted cancer registrations counts by cancer type, age, sex, and ethnicity directly from the Cancer Registry. We used 2018 data from a 2021 extract of the cancer registry provided to the University of Otago for earlier work and re-used with permission for this project. The Cancer Registry database is continually updated (e.g. historical registrations added, duplicates removed) and therefore counts of cancer registrations obtained for the same time period but from different extract dates may differ. Table 2 outlines the ICD-10 codes for the different cancer types included in the analysis.

Table 2. ICD-10-AM codes used to classify cancers by type for the AAF analysis

ICD-10-AM code	Cancer type
C00-C96, D45-D47	All cancers
C50	Breast
C18-C20	Colorectal
C32	Laryngeal
C00-C08	Lip and oral
C22	Liver
C11	Nasopharyngeal
C15	Oesophageal
C09, C10, C12, C13	Pharyngeal

YLLs, YLDs and DALYs

We used the GBD Results Tool[6] to obtain Aotearoa New Zealand-specific counts of years of life lost (YLLs), years lived with disability (YLDs), and disability-adjusted life years (DALYs) for each condition and for the overall Aotearoa New Zealand population, by age and sex. Therefore, no further mapping or processing of data was required to generate the health loss counts used in the analysis as condition names and definitions were already aligned.

Age and sex standardisation

To account for differences in age and sex structure between Māori and non-Māori populations, we also calculated age and sex standardised rates of alcohol attributable health loss (for measures where data were available by ethnicity). Rates were standardised to the 2018 Māori estimated resident population from Stats NZ.[7] This standard was chosen to frame prevalence estimates for other ethnic groups in relation to this Indigenous standard (age and sex structure).[8]

The estimated resident population is the latest estimates of people who usually live in New Zealand based on the 2018 Census, and adjusted for net census undercount, residents temporarily overseas, and population change due to births, deaths, and migration, between census night (6 March 2018) and the mid-year reference date (30 June 2018).[7] The estimated resident population by age, sex, and ethnicity is reproduced in Table 3, and the weights applied by age and sex are given in Table 4.

Table 3. Estimated Resident Population count by age, sex, and ethnicity

Ethnicity	Sex	Age group	ERP2018
Māori	Female	15-24	70,600
		25-34	59,020
		35-44	46,560
		45-54	46,810
		55-64	36,130
		65-74	18,130
		75-99	8,980
	Male	15-24	73,920
		25-34	56,960
		35-44	43,800
		45-54	44,180
		55-64	32,730
		65-74	16,270
		75-99	6,720
Non-Māori	Female	15-24	246,930
		25-34	293,860
		35-44	264,460
		45-54	287,970
		55-64	265,830
		65-74	200,560
		75-99	164,080
	Male	15-24	265,980
		25-34	299,580
		35-44	256,430
		45-54	274,800
		55-64	252,680
		65-74	191,790
		75-99	128,390

Table 4. Weights used to calculate age and sex standardised rates (calculated using the 2018 Māori estimated resident population)

Sex	Age group	wgt2018
Female	15-24	0.125889
	25-34	0.105241
	35-44	0.083023
	45-54	0.083469
	55-64	0.064425
	65-74	0.032328
	75-99	0.016013
Male	15-24	0.131809
	25-34	0.101567
	35-44	0.078101
	45-54	0.078779
	55-64	0.058362
	65-74	0.029012
	75-99	0.011983

Alcohol use inputs for AAFs

Multiple data sources were combined to calculate the alcohol use inputs for InterMAHP. We calculated the measures of per capita consumption by sex, age group and ethnicity (Māori/non-Māori). We used three data sources across several analytical steps: New Zealand Health Survey (NZHS), Stats NZ Alcohol Available for Consumption, and the World Health Organization's (WHO) Global Information System on Alcohol and Health (GISAH).

Stats NZ reports that for the entire Aotearoa New Zealand population in 2018, the litres of ethanol per person aged 15+ was 8.92 L. This value is considered 'recorded' alcohol. We performed adjustments using Aotearoa New Zealand specific data for 2019 from GISAH. According to GISAH, 'unrecorded' alcohol in Aotearoa New Zealand is 14.29% the size of recorded alcohol (i.e. 1.27 L), summing to a 'total' alcohol value of 10.19 L. GISAH reports that the Aotearoa New Zealand population consumes more alcohol outside of Aotearoa New Zealand than tourists visiting Aotearoa New Zealand consume within the country. This equates to 2.88% increase in total alcohol (i.e. 0.29 L). When added together, total alcohol and tourist alcohol equals 10.49L, which is the per capita alcohol consumption for Aotearoa New Zealand.

Since this value was not specific to ethnicity, we used NZHS data to produce ethnicity-specific ratios. Survey respondents were excluded from the analysis if data on ethnicity, sex, or age was missing, or if the survey question used to calculate the measure had a response missing. Survey questions about 'standard drinks' were accompanied with a show card depicting how many standard drinks that each of a range of common alcohol beverage types and container sizes equated to. The key NZHS questions were 'How often do you have a drink containing alcohol?' and 'Looking at the Showcard, how many drinks containing alcohol do you have on a typical day when you are drinking?' (referring to one standard drink). We multiplied the responses using a standard frequency-quantity approach and performed additional unit conversions to yield number of standard drinks per day. We then calculated the mean number of standard drinks per person aged 15 + per day for Māori, non-Māori, and the total NZ population. We constructed ratios from these values (1.08 for Māori; 0.99 for non-Māori).

Multiplying the per capita consumption value of 10.49 L by each ratio yields a per capita consumption estimate for Māori of 11.34 L and for non-Māori of 10.38 L.

Finally, the relative consumption by age and sex within each ethnic group from the NZHS analysis was included as an International Model of Alcohol Harms and Policies (InterMAHP) input. Consumption within each population group (i.e. by ethnicity, sex, and age group) was calculated within InterMAHP and the resulting estimates of per capita consumption are given in Table 5.

Table 5. Per capita alcohol consumption estimates used as inputs to InterMAHP

Ethnicity	Sex	Age group	Per capita consumption (litres of ethanol per year)		
			Central estimate (used for main result)	Lower estimate (used to calculate lower uncertainty interval)	Upper estimate (used to calculate upper uncertainty interval)
Māori	Female	15-24	6.91	5.53	8.30
Māori	Female	25-34	7.14	5.71	8.57
Māori	Female	35-44	11.11	8.89	13.33
Māori	Female	45-54	9.97	7.98	11.97
Māori	Female	55-64	8.95	7.16	10.74
Māori	Female	65-74	4.42	3.54	5.30
Māori	Female	≥75	2.83	2.27	3.40
Māori	Male	15-24	12.24	9.79	14.69
Māori	Male	25-34	12.81	10.25	15.37
Māori	Male	35-44	16.09	12.88	19.31
Māori	Male	45-54	18.13	14.51	21.76
Māori	Male	55-64	17.23	13.78	20.67
Māori	Male	65-74	15.53	12.42	18.63
Māori	Male	≥75	12.47	9.97	14.96
Non-Māori	Female	15-24	4.97	5.97	5.97
Non-Māori	Female	25-34	4.76	5.72	5.72
Non-Māori	Female	35-44	6.42	7.71	7.71
Non-Māori	Female	45-54	8.60	10.31	10.31
Non-Māori	Female	55-64	7.97	9.57	9.57
Non-Māori	Female	65-74	6.42	7.71	7.71
Non-Māori	Female	≥75	6.01	7.21	7.21
Non-Māori	Male	15-24	12.12	14.54	14.54
Non-Māori	Male	25-34	12.12	14.54	14.54
Non-Māori	Male	35-44	13.36	16.03	16.03
Non-Māori	Male	45-54	16.26	19.51	19.51
Non-Māori	Male	55-64	18.54	22.25	22.25
Non-Māori	Male	65-74	17.09	20.51	20.51
Non-Māori	Male	≥75	10.36	12.43	12.43

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Appendices

Appendix 1: Mapping of ICD codes to define conditions in mortality and hospital discharges datasets

Condition	Manatū Hauora publicly funded hospital discharges	Manatū Hauora mortality web tool
Alcohol use disorders	F10, X45, X65, Y15	F10, X45, X65, Y15
Alcoholic cardiomyopathy[a]	I42	I42
Alcoholic gastritis[a]	K29	K29
Atrial fibrillation and cardiac arrhythmia	I48	I48
Breast cancer	C50	C50
Colorectal cancer	C18, C19, C20	C18, C19, C20, C21
Diabetes	E10, E11, E13, E14	E10, E11, E13, E14
Epilepsy	G40, G41	G40, G41
Hypertension	I11	I11
Interpersonal violence	X85, X89, X90, X91, X93, X95, X97, X98, X99, Y00, Y01, Y03, Y04, Y05, Y06, Y07, Y08, Y09	X85, X88, X91, X92, X93, X95, X97, X99, Y00, Y03, Y04, Y06, Y07, Y08, Y09, Y87
Ischaemic heart disease	I20, I21, I22, I23, I24, I25	I20, I21, I22, I24, I25
Larynx cancer	C32	C32
Lip and oral cavity cancer	C00, C01, C02, C03, C04, C05, C06, C07, C08	C00, C01, C02, C03, C04, C05, C06, C07, C08
Liver cancer	C22	C22
Liver cirrhosis	K70, K71, K72, K73, K74, K75, K76, K77	K70, K71, K72, K73, K74, K75, K76
Lower respiratory tract infections	J09, J10, J11, J12, J13, J14, J15, J16, J17, J18, J20, J21, J22, J85, J86	J09, J10, J11, J12, J13, J14, J15, J16, J18, J20, J21, J22, J85, J86, P23
Nasopharynx cancer	C11	C11
Oesophageal cancer	C15	C15
Pancreatitis	K85, K86	K85, K86
Pharynx cancer	C09, C10, C12, C13	C09, C10, C12, C13
Self-harm	X60, X61, X62, X63, X64, X66, X67, X68, X69, X70, X71, X72, X74, X76, X77, X78, X79, X80, X81, X82, X83, X84	X60, X61, X62, X63, X64, X66, X67, X68, X69, X70, X71, X72, X74, X75, X76, X78, X80, X81, X82, X83, X84
Stroke[b]	G45, G46, I60, I61, I62, I63, I64, I65, I66, I67, I68, I69	G45, I60, I61, I62, I63, I64, I67, I69

Transport injuries	V00, V01, V02, V03, V04, V05, V06, V09, V10, V11, V12, V13, V14, V16, V17, V18, V19, V20, V21, V22, V23, V24, V26, V27, V28, V29, V32, V33, V34, V37, V38, V39, V40, V41, V42, V43, V44, V45, V46, V47, V48, V49, V53, V54, V55, V57, V58, V59, V60, V63, V64, V67, V68, V69, V73, V74, V77, V78, V79, V80, V81, V82, V83, V84, V85, V86, V87, V88, V89, V90, V91, V92, V93, V94, V95, V96, V97, V98, V99	V00, V02, V03, V04, V05, V09, V10, V11, V12, V13, V14, V15, V17, V18, V19, V20, V22, V23, V24, V27, V28, V29, V37, V38, V40, V43, V44, V45, V46, V47, V48, V49, V50, V52, V53, V54, V55, V57, V58, V59, V63, V64, V65, V67, V68, V73, V77, V78, V79, V80, V81, V83, V84, V85, V86, V87, V90, V91, V92, V93, V94, V95, V96, V97, V99, Y85
Tuberculosis	A15, A16, A17, A18, A19	A15, A16, A17, A18, A19, B90
Unintentional injuries	W00, W01, W02, W03, W04, W05, W06, W07, W08, W09, W10, W11, W12, W13, W14, W15, W16, W17, W18, W19, W20, W21, W22, W23, W24, W25, W26, W27, W28, W29, W30, W31, W32, W34, W36, W37, W38, W39, W40, W41, W44, W45, W46, W49, W50, W51, W52, W53, W54, W55, W56, W57, W60, W61, W64, W65, W67, W68, W69, W70, W73, W74, W75, W76, W78, W79, W80, W81, W84, W85, W86, W87, W88, W89, W91, W92, W93, W94, X00, X01, X02, X03, X04, X05, X06, X08, X09, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X21, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X36, X37, X39, X40, X41, X42, X43, X44, X46, X47, X48, X49, X50, X51, X53, X54, X58, X59, Y10, Y11, Y12, Y13, Y14, Y16, Y17, Y18, Y19, Y20, Y21, Y22, Y24, Y26, Y27, Y28, Y29, Y30, Y31, Y32, Y33, Y34	W00, W01, W02, W03, W04, W05, W06, W07, W08, W09, W10, W11, W12, W13, W14, W15, W16, W17, W18, W19, W20, W21, W22, W23, W24, W25, W26, W27, W28, W29, W30, W31, W34, W36, W37, W38, W40, W41, W44, W45, W49, W50, W51, W54, W55, W56, W57, W64, W65, W66, W67, W68, W69, W70, W73, W74, W75, W76, W77, W78, W79, W80, W81, W83, W84, W85, W86, W87, W92, W93, W94, X00, X01, X02, X03, X04, X05, X06, X08, X09, X10, X11, X16, X19, X21, X23, X30, X31, X32, X33, X34, X36, X37, X38, X39, X40, X41, X42, X43, X44, X46, X47, X48, X49, X50, X51, X53, X58, X59, Y10, Y11, Y12, Y14, Y17, Y18, Y20, Y21, Y24, Y26, Y28, Y30, Y31, Y32, Y33, Y34, Y40, Y42, Y43, Y44, Y45, Y47, Y48, Y49, Y51, Y52, Y54, Y55, Y57, Y59, Y60, Y63, Y65, Y71, Y73, Y83, Y84, Y86, Y88

[a] ICD codes relate to all cardiomyopathy and all gastritis. Individual level data were used to estimate the proportion of cardiomyopathy and gastritis counts that were alcoholic (by age, sex, and ethnicity).

[b] GBD 2016 relative risks have separate values for ischaemic and haemorrhagic stroke. We used findings from Krishnamurthi (2018) to split stroke codes into the two main sub-types for the analysis.

Appendix 2: Categorisation of hospitalisation and mortality data into condition groups

Condition Group	ICD-10-AM codes used for Manatū Hauora publicly funded hospital discharges analysis	ICD-10-AM codes used for Manatū Hauora mortality web tool
(1) Injuries	V00, V01, V02, V03, V04, V05, V06, V09, V10, V11, V12, V13, V14, V16, V17, V18, V19, V20, V21, V22, V23, V24, V26, V27, V28, V29, V32, V33, V34, V37, V38, V39, V40, V41, V42, V43, V44, V45, V46, V47, V48, V49, V53, V54, V55, V57, V58, V59, V60, V63, V64, V67, V68, V69, V73, V74, V77, V78, V79, V80, V81, V82, V83, V84, V85, V86, V87, V88, V89, V90, V91, V92, V93, V94, V95, V96, V97, V98, V99, W00, W01, W02, W03, W04, W05, W06, W07, W08, W09, W10, W11, W12, W13, W14, W15, W16, W17, W18, W19, W20, W21, W22, W23, W24, W25, W26, W27, W28, W29, W30, W31, W32, W34, W36, W37, W38, W39, W40, W41, W44, W45, W46, W49, W50, W51, W52, W53, W54, W55, W56, W57, W60, W61, W64, W65, W67, W68, W69, W70, W73, W74, W75, W76, W78, W79, W80, W81, W84, W85, W86, W87, W88, W89, W91, W92, W93, W94, X00, X01, X02, X03, X04, X05, X06, X08, X09, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X21, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X36, X37, X39, X40, X41, X42, X43, X44, X46, X47, X48, X49, X50, X51, X53, X54, X58, X59, X60, X61, X62, X63, X64, X66, X67, X68, X69, X70, X71, X72, X74, X76, X77, X78, X79, X80, X81, X82, X83, X84, X85, X89, X90, X91, X93, X95, X97, X98, X99, Y00, Y01, Y03, Y04, Y05, Y06, Y07, Y08, Y09, Y10, Y11, Y12, Y13, Y14, Y16, Y17, Y18, Y19, Y20, Y21, Y22, Y24, Y26, Y27, Y28, Y29, Y30, Y31, Y32, Y33, Y34	V00, V02, V03, V04, V05, V09, V10, V11, V12, V13, V14, V15, V17, V18, V19, V20, V22, V23, V24, V27, V28, V29, V37, V38, V40, V43, V44, V45, V46, V47, V48, V49, V50, V52, V53, V54, V55, V57, V58, V59, V63, V64, V65, V67, V68, V73, V77, V78, V79, V80, V81, V83, V84, V85, V86, V87, V90, V91, V92, V93, V94, V95, V96, V97, V99, W00, W01, W02, W03, W04, W05, W06, W07, W08, W09, W10, W11, W12, W13, W14, W15, W16, W17, W18, W19, W20, W21, W22, W23, W24, W25, W26, W27, W28, W29, W30, W31, W34, W36, W37, W38, W40, W41, W44, W45, W49, W50, W51, W54, W55, W56, W57, W64, W65, W66, W67, W68, W69, W70, W73, W74, W75, W76, W77, W78, W79, W80, W81, W83, W84, W85, W86, W87, W92, W93, W94, X00, X01, X02, X03, X04, X05, X06, X08, X09, X10, X11, X16, X19, X21, X23, X30, X31, X32, X33, X34, X36, X37, X38, X39, X40, X41, X42, X43, X44, X46, X47, X48, X49, X50, X51, X53, X58, X59, X60, X61, X62, X63, X64, X66, X67, X68, X69, X70, X71, X72, X74, X75, X76, X78, X80, X81, X82, X83, X84, X85, X88, X91, X92, X93, X95, X97, X99, Y00, Y03, Y04, Y06, Y07, Y08, Y09, Y10, Y11, Y12, Y14, Y17, Y18, Y20, Y21, Y24, Y26, Y28, Y30, Y31, Y32, Y33, Y34, Y35, Y36, Y40, Y42, Y43, Y44, Y45, Y47, Y48, Y49, Y51, Y52, Y54, Y55, Y57, Y59, Y60, Y63, Y65, Y71, Y73, Y83, Y84, Y85, Y86, Y87, Y88, Y89
(2) Cardiovascular conditions	G45, G46, I01, I05, I06, I07, I08, I09, I10, I11, I12, I13, I15, I20, I21, I22, I23, I24, I25, I26, I27, I28, I30, I31, I32, I33, I34, I35, I36, I37, I38, I40, I41, I42, I43, I44, I45, I46, I47, I48, I49, I50, I51, I60, I61, I62, I63, I64, I65, I66, I67, I68, I69, I70, I71, I72, I73, I74, I77, I78, I80, I81,	G45, I01, I05, I06, I07, I08, I09, I10, I11, I12, I13, I20, I21, I22, I24, I25, I26, I27, I28, I30, I31, I33, I34, I35, I36, I38, I40, I42, I44, I45, I46, I47, I48, I49, I50, I51, I60, I61, I62, I63, I64, I67, I69, I70, I71, I72, I73, I74, I77, I78, I80, I81, I82, I83, I84, I85, I86, I87, I89, I95, I99

	I82, I83, I85, I86, I87, I88, I89, I95, I97, I98, I99	
(3) Diabetes	E10, E11, E13, E14	E10, E11, E13, E14
(4) Cancers	C00, C01, C02, C03, C04, C05, C06, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C30, C31, C32, C33, C34, C37, C38, C39, C40, C41, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C88, C90, C91, C92, C93, C94, C95, C96, D09, D45, D46, D47	C00, C01, C02, C03, C04, C05, C06, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C30, C31, C32, C33, C34, C37, C38, C39, C40, C41, C43, C44, C45, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C80, C81, C82, C83, C84, C85, C86, C88, C90, C91, C92, C93, C94, C95, C96, D09, D45, D46, D47
(5) Communicable diseases	A00, A01, A02, A03, A04, A05, A06, A07, A08, A09, A15, A16, A17, A18, A19, A23, A26, A27, A28, A31, A32, A36, A37, A38, A39, A40, A41, A42, A43, A46, A48, A49, A51, A52, A53, A54, A55, A56, A59, A60, A63, A64, A68, A69, A74, A75, A77, A78, A81, A85, A86, A87, A88, A90, A91, A92, A93, A94, B00, B01, B02, B05, B06, B07, B08, B09, B15, B16, B17, B18, B19, B20, B23, B24, B25, B26, B27, B30, B33, B34, B35, B36, B37, B38, B43, B44, B45, B46, B47, B48, B50, B51, B53, B54, B55, B58, B59, B60, B67, B69, B74, B77, B78, B80, B81, B82, B83, B85, B86, B87, B88, B89, B99, I00, I02, J00, J01, J02, J03, J04, J05, J06, J09, J10, J11, J12, J13, J14, J15, J16, J17, J18, J20, J21, J22, J85, J86, P23	A02, A03, A04, A05, A06, A07, A08, A09, A15, A16, A17, A18, A19, A28, A31, A32, A35, A37, A39, A40, A41, A43, A46, A48, A49, A50, A52, A81, A85, A86, A87, B00, B01, B02, B16, B17, B18, B20, B21, B22, B23, B24, B25, B27, B30, B33, B34, B37, B44, B45, B46, B47, B50, B58, B59, B67, B69, B78, B86, B90, B91, B94, B99, I00, J01, J02, J03, J04, J05, J06, J09, J10, J11, J12, J13, J14, J15, J16, J18, J20, J21, J22, J85, J86, P23
(6) Other	D00, D01, D02, D03, D04, D05, D06, D07, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36, D37, D38, D39, D40, D41, D42, D43, D44, D48, D50, D51, D52, D53, D55, D56, D57, D58, D59, D60, D61, D62, D64, D65, D66, D67, D68, D69, D70, D71, D72, D73, D74, D75, D76, D80, D81, D82, D83, D84, D86, D89, E02, E03, E04, E05, E06, E07, E09, E15, E16, E20, E21, E22, E23, E24, E25, E26, E27, E28, E29, E30, E31, E32, E34, E41, E43, E44, E45, E46, E51, E53, E55, E56, E58, E61, E63, E65, E66, E70, E71, E72, E73,	D12, D13, D14, D15, D16, D17, D18, D21, D25, D27, D30, D32, D33, D35, D36, D37, D38, D39, D41, D42, D43, D44, D48, D50, D51, D52, D53, D55, D56, D57, D58, D59, D60, D61, D62, D64, D65, D66, D67, D68, D69, D70, D72, D73, D75, D76, D80, D81, D82, D83, D84, D86, D89, E03, E04, E05, E06, E07, E16, E21, E22, E23, E24, E26, E27, E31, E34, E41, E43, E46, E51, E53, E61, E63, E64, E66, E70, E71, E72, E74, E75, E76, E77, E78, E79, E80, E83, E84, E85, E86, E87, E88, F01, F03, F05, F06, F10, F11, F12, F15, F19, F20, F21, F22, F25, F29, F31, F32, F33, F41, F42, F43, F45, F50, F55, F60, F70, F72, F73, F79,

E74, E75, E76, E77, E78, E79, E80, E83, E84, E85, E86, E87, E88, E89, F00, F01, F02, F03, F04, F05, F06, F07, F09, F10, F11, F12, F13, F14, F15, F16, F17, F18, F19, F20, F21, F22, F23, F25, F28, F29, F30, F31, F32, F33, F34, F38, F39, F40, F41, F42, F43, F44, F45, F48, F50, F51, F53, F54, F55, F60, F61, F62, F63, F64, F65, F66, F68, F69, F70, F71, F72, F73, F79, F80, F81, F82, F83, F84, F88, F89, F90, F91, F92, F93, F94, F95, F98, F99, G00, G01, G02, G03, G04, G05, G06, G08, G10, G11, G12, G13, G20, G21, G22, G23, G24, G25, G30, G31, G32, G35, G36, G37, G40, G41, G43, G44, G47, G50, G51, G52, G53, G54, G55, G56, G57, G58, G60, G61, G62, G63, G64, G70, G71, G72, G73, G80, G81, G82, G83, G90, G91, G92, G93, G94, G95, G96, G97, G98, G99, H00, H01, H02, H03, H04, H05, H06, H10, H11, H13, H15, H16, H17, H18, H19, H20, H21, H22, H25, H26, H27, H30, H31, H32, H33, H34, H35, H40, H43, H44, H46, H47, H48, H49, H50, H51, H52, H53, H54, H55, H57, H58, H59, H60, H61, H62, H65, H66, H67, H68, H69, H70, H71, H72, H73, H74, H80, H81, H83, H90, H91, H92, H93, H94, H95, J30, J31, J32, J33, J34, J35, J36, J37, J38, J39, J40, J41, J42, J43, J44, J45, J46, J47, J60, J61, J66, J67, J68, J69, J70, J80, J81, J82, J84, J90, J91, J92, J93, J94, J95, J96, J98, J99, K00, K01, K02, K03, K04, K05, K06, K07, K08, K09, K10, K11, K12, K13, K14, K20, K21, K22, K25, K26, K27, K28, K29, K30, K31, K35, K36, K37, K38, K40, K41, K42, K43, K44, K45, K46, K50, K51, K52, K55, K56, K57, K58, K59, K60, K61, K62, K63, K64, K65, K66, K67, K70, K71, K72, K73, K74, K75, K76, K77, K80, K81, K82, K83, K85, K86, K90, K91, K92, L00, L01, L02, L03, L04, L05, L08, L10, L11, L12, L13, L20, L21, L22, L23, L24, L25, L26, L27, L28, L29, L30, L40, L41, L42, L43, L44, L50, L51, L52, L53, L55, L56, L57, L58, L59, L60, L65, L66, L68, L70, L71, L72, L73, L74, L81, L82, L83, L84, L85, L88, L89, L90, L91, L92, L93, L94, L95, L97, L98, L99, M00, M01, M02, M03, M05, M06, F84, F89, G00, G03, G04, G06, G08, G09, G10, G11, G12, G14, G20, G21, G23, G24, G25, G30, G31, G35, G36, G37, G40, G41, G47, G52, G54, G58, G60, G61, G62, G70, G71, G72, G80, G81, G82, G83, G90, G91, G93, G95, G96, G98, H05, H25, H35, H44, H49, H60, H66, H70, H81, J32, J34, J35, J36, J37, J38, J39, J40, J41, J42, J43, J44, J45, J46, J47, J60, J61, J62, J63, J64, J67, J68, J69, J70, J80, J81, J82, J84, J90, J92, J93, J94, J96, J98, K02, K04, K05, K07, K10, K11, K12, K20, K21, K22, K25, K26, K27, K28, K29, K30, K31, K35, K36, K37, K38, K40, K41, K42, K43, K44, K45, K46, K50, K51, K52, K55, K56, K57, K58, K59, K60, K61, K62, K63, K64, K65, K66, K70, K71, K72, K73, K74, K75, K76, K80, K81, K82, K83, K85, K86, K90, K92, L02, L03, L05, L08, L10, L11, L12, L27, L30, L40, L50, L51, L52, L53, L60, L88, L89, L93, L95, L97, L98, M00, M05, M06, M08, M10, M11, M13, M15, M16, M17, M19, M21, M23, M24, M25, M30, M31, M32, M33, M34, M35, M40, M41, M43, M45, M46, M47, M48, M50, M51, M54, M60, M62, M65, M66, M70, M71, M72, M75, M79, M80, M81, M84, M85, M86, M87, M88, M94, M95, N00, N01, N02, N03, N04, N05, N06, N07, N10, N11, N12, N13, N14, N15, N17, N18, N19, N20, N21, N25, N26, N27, N28, N30, N31, N32, N34, N35, N36, N39, N40, N41, N42, N45, N48, N49, N61, N70, N71, N73, N76, N80, N81, N82, N83, N84, N85, N90, N92, N93, N94, O00, O10, O23, O41, O44, O85, O86, O87, O88, O90, O98, O99, P05, P07, P10, P11, P15, P20, P21, P22, P24, P25, P26, P27, P28, P29, P35, P36, P37, P38, P39, P50, P52, P53, P54, P55, P56, P61, P70, P76, P77, P78, P83, P91, P95, P96, Q00, Q01, Q02, Q03, Q04, Q05, Q07, Q15, Q18, Q20, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q31, Q32, Q33, Q34, Q36, Q38, Q39, Q42, Q43, Q44, Q45, Q54, Q60, Q61, Q62, Q63, Q64, Q65, Q66, Q67, Q72, Q74, Q75, Q76, Q77, Q78, Q79, Q80, Q81, Q82, Q84, Q85, Q87, Q89, Q90, Q91, Q92, Q93,

M07, M08, M09, M10, M11, M12, M13, M14, M15, M16, M17, M18, M19, M20, M21, M22, M23, M24, M25, M30, M31, M32, M33, M34, M35, M36, M40, M41, M42, M43, M45, M46, M47, M48, M49, M50, M51, M53, M54, M60, M61, M62, M63, M65, M66, M67, M68, M70, M71, M72, M75, M76, M77, M79, M80, M81, M82, M83, M84, M85, M86, M87, M88, M89, M90, M91, M92, M93, M94, M95, M96, N00, N01, N02, N03, N04, N05, N06, N08, N10, N11, N12, N13, N14, N15, N16, N17, N18, N19, N20, N21, N23, N25, N26, N28, N29, N30, N31, N32, N34, N35, N36, N39, N40, N41, N42, N43, N44, N45, N46, N47, N48, N49, N50, N51, N60, N61, N62, N63, N64, N70, N71, N72, N73, N74, N75, N76, N77, N80, N81, N82, N83, N84, N85, N86, N87, N88, N89, N90, N91, N92, N93, N94, N95, N96, N97, N98, N99, O00, O01, O02, O03, O04, O05, O06, O07, O08, O10, O11, O12, O13, O14, O15, O16, O20, O21, O22, O23, O24, O25, O26, O28, O30, O31, O32, O33, O34, O35, O36, O40, O41, O42, O43, O44, O45, O46, O47, O48, O60, O61, O62, O63, O64, O65, O66, O67, O68, O69, O70, O71, O72, O73, O74, O75, O80, O81, O82, O83, O84, O85, O86, O87, O88, O89, O90, O91, O92, O98, O99, P00, P01, P02, P03, P04, P05, P07, P08, P10, P11, P12, P13, P14, P15, P20, P21, P22, P24, P25, P27, P28, P29, P35, P36, P37, P38, P39, P50, P51, P52, P53, P54, P55, P58, P59, P61, P70, P71, P74, P76, P77, P78, P80, P81, P83, P90, P91, P92, P94, P96, Q01, Q02, Q03, Q04, Q05, Q06, Q07, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q20, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q30, Q31, Q32, Q33, Q34, Q35, Q36, Q38, Q39, Q40, Q41, Q42, Q43, Q44, Q45, Q50, Q51, Q52, Q53, Q54, Q55, Q56, Q60, Q61, Q62, Q63, Q64, Q65, Q66, Q67, Q68, Q69, Q70, Q71, Q72, Q74, Q75, Q76, Q77, Q78, Q79, Q80, Q81, Q82, Q83, Q84, Q85, Q86, Q87, Q89, Q90, Q91, Q92, Q93, Q96, Q97, Q98, Q99,	Q95, Q96, Q98, Q99, R00, R02, R04, R09, R13, R31, R40, R41, R47, R54, R56, R57, R58, R63, R64, R68, R95, R99, U07, X45, X65, Y15

R00, R01, R02, R03, R04, R05, R06, R07, R09, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R25, R26, R27, R29, R30, R31, R32, R33, R34, R35, R36, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R68, R69, R70, R71, R72, R73, R74, R76, R77, R78, R79, R80, R81, R82, R84, R85, R86, R87, R89, R90, R91, R92, R93, R94, R95, R96, R99, T78, T80, T81, T82, T83, T84, T85, T86, T87, T88, Z00, Z01, Z02, Z03, Z04, Z08, Z09, Z11, Z12, Z13, Z20, Z22, Z23, Z24, Z25, Z26, Z27, Z28, Z29, Z30, Z31, Z34, Z35, Z36, Z38, Z39, Z40, Z41, Z42, Z43, Z44, Z45, Z46, Z47, Z48, Z49, Z50, Z51, Z52, Z53, Z54, Z56, Z57, Z58, Z59, Z60, Z61, Z62, Z63, Z65, Z71, Z72, Z73, Z74, Z75, Z76, Z80, Z82, Z83, U66, X45, X65, Y15, Y35	

Appendix 3: Exclusions applied to Manatū Hauora hospitalisation dataset

	ICD-10-AM Codes (ICDThreeCharCode variable in original dataset)
Exclusions from DischargesAll dataset	S00, S01, S02, S03, S04, S05, S06, S08, S09, S10, S11, S12, S13, S14, S15, S16, S17, S19, S20, S21, S22, S23, S24, S25, S26, S27, S28, S29, S30, S31, S32, S33, S34, S35, S36, S37, S38, S39, S40, S41, S42, S43, S44, S45, S46, S47, S48, S49, S50, S51, S52, S53, S54, S55, S56, S57, S58, S59, S60, S61, S62, S63, S64, S65, S66, S67, S68, S69, S70, S71, S72, S73, S74, S75, S76, S77, S79, S80, S81, S82, S83, S84, S85, S86, S87, S88, S89, S90, S91, S92, S93, S94, S95, S96, S97, S98, S99, T00, T01, T04, T07, T08, T09, T11, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22, T23, T24, T25, T26, T27, T28, T29, T33, T34, T35, T36, T37, T38, T39, T40, T41, T42, T43, T44, T45, T46, T47, T48, T49, T50, T51, T52, T53, T54, T55, T56, T57, T58, T59, T60, T61, T62, T63, T65, T66, T67, T68, T69, T70, T71, T73, T74, T75, T79, T89
Exclusions from DischargesInjury dataset	U73, U90, Y40, Y41, Y42, Y43, Y44, Y45, Y46, Y47, Y48, Y49, Y50, Y51, Y52, Y53, Y54, Y55, Y56, Y57, Y58, Y59, Y60, Y61, Y62, Y63, Y64, Y65, Y69, Y70, Y71, Y72, Y73, Y74, Y75, Y76, Y77, Y78, Y79, Y80, Y81, Y82, Y83, Y84, Y85, Y86, Y87, Y88, Y89, Y90, Y92, Y95

Appendix 4: Mapping of read codes in ACC data to interpersonal violence and self-harm

Interpersonal violence	U...., U0..., U002., U0020, U047., U0485, U0804, U1..., U101., U102., U106., U108y, U111., U112., U113., U113z, U115., U116., U1162, U11C., U11L., U11Q., U11Q5, U11Qy, U11Qz, U11R., U11R0, U11R1, U11R7, U11Rz, U11y., U120., U1200, U1201, U120y, U122., U123., U124., U1240, U124z, U125., U1256, U126., U127., U127y, U127z, U12A., U13.., U132., U133., U134., U13z0, U14.., U140., U141., U1410, U141z, U143., U1430, U143y, U144., U1440, U145., U1450, U1456, U15.., U150., U151., U152., U1526, U158., U16.., U16y0, U16z0, U17.., U170., U171., U172., U173., U18.., U181., U181y, U181z, U183., U1830, U186., U191., U191z, U1926, U1A.., U1A0., U1A17, U1A4., U1A80, U1A8y, U1A9., U1A9z, U1AB., U1AB0, U1ABz, U1AC., U1AC0, U1ACy, U1ACz, U1Ay., U1Ay0, U1Ay2, U1Ay3, U1Ay5, U1Ay6, U1Ayy, U1Ayz, U1B0., U1B00, U1B07, U1C.., U1Cy6, U1Cz., U1Cz0, U2..., U20.., U200., U2000, U202., U204., U205., U2080, U208y, U208z, U209., U2090, U20B., U20C., U20Cy, U20y., U20y0, U20yy, U20yz, U21.., U210., U21z., U22z., U27.., U27y., U28.., U29.., U290., U291., U295., U29z., U2E.., U2y.., U2y0., U2y1., U2yy., U2yz., U2z.., U2z0., U2zz., U3..., U30.., U300., U34.., U340., U35.., U36.., U360., U364., U36z., U370., U38.., U39.., U3E.., U3F.., U3Fz., U3K.., U3K0., U3K4., U3Ky., U3L.., U3L0., U3L1., U3L2., U3L3., U3L4., U3L5., U3Ly., U3Lz., U3y.., U3z.., U3zz., U40.., U4080, U409., U409y, U40B., U40y., U40y0, U40y7, U41.., U410., U42.., U420., U42y., U430., U47.., U470., U49.., U4A.., U6..., U60.., U601y, U6055, U6097, U60G., U60G5, U60G9, U60K., U61.., U610., U611y, U6141, U700., U72.., U83.., TL..., TL0.., TL00., TL01., TL0z., TL10., TL1z., TL2.., TL20., TL22., TL3.., TL31., TL32., TL33., TL3z., TL4.., TL50., TL51., TL54., TL6.., TL60., TL61., TL62., TL63., TL64., TL6z., TL7.., TL70., TLx.., TLx2., TLx20, TLx21, TLx2z, TLxy., TLxy0, TLxyz, TLxz., TLxz3, TLxzz, TLy.., TLz..
Self-Harm	TK..., TK0.., TK00., TK02., TK04., TK05., TK06., TK07., TK0z., TK1.., TK11., TK2.., TK20., TK21., TK2y., TK2z., TK3.., TK30., TK3y., TK3z., TK4.., TK50., TK51., TK6.., TK60., TK601, TK61., TK6z., TK7.., TKx.., TKx0., TKx00, TKx1., TKx3., TKx4., TKx5., TKx7., TKxz., TKy.., TKz..