

APPENDIX**Table A1: Classification of time-critical conditions**

Condition type	Inclusion criteria	ICD-10 code	ICD-10 descriptor	Verbal autopsy code and descriptor
Communicable	Age: Non-neonatal deaths	A40	Streptococcal sepsis	01.01 Sepsis
		A41	Other sepsis	01.02 Acute respiratory infection, including pneumonia
		G00	Bacterial meningitis, not elsewhere classified	
		G03	Meningitis due to other and unspecified causes	01.05 Malaria
		J05	Acute obstructive laryngitis [croup] and epiglottitis	01.07 Meningitis and encephalitis
		B50	Plasmodium falciparum malaria	
Neonatal	Age: Neonatal only	A40	Streptococcal sepsis	01.01 Sepsis
		A41	Other sepsis	01.02 Acute respiratory infection, including pneumonia
		A49	Bacterial infection of unspecified site	01.07 Meningitis and encephalitis
		G00	Bacterial meningitis, not elsewhere classified	01.99 Unspecified infectious disease
		G03	Meningitis due to other and unspecified causes	10.02 Birth asphyxia
		J15	Bacterial pneumonia, not elsewhere classified	10.03 Neonatal pneumonia
		J16	Pneumonia due to other infectious organisms, not elsewhere classified	10.04 Neonatal sepsis
		J18	Pneumonia, organism unspecified	10.06 Congenital malformation
		J22	Unspecified acute lower respiratory infection	10.99 Other and unspecified perinatal cause of death

		P08	<i>Disorders related to long gestation and high birth weight</i>	
		P20	<i>Intrauterine hypoxia</i>	
		P21	Birth asphyxia	
		P22	Respiratory distress of newborn	
		P23	Congenital pneumonia	
		P36	Bacterial sepsis of newborn	
		P50	<i>Fetal blood loss</i>	
		P55	<i>Haemolytic disease of fetus and newborn</i>	
		P58	<i>Neonatal jaundice due to other excessive haemolysis</i>	
		P76	<i>Other intestinal obstruction of newborn</i>	
		P90	Convulsions of newborn	
		Q41	<i>Congenital absence, atresia and stenosis of small intestine</i>	
		Q43	<i>Other congenital malformations of intestine</i>	
		Q45	<i>Other congenital malformations of digestive system</i>	
Maternal	Nil	O00	<i>Ectopic pregnancy</i>	09.01 Ectopic pregnancy
		O06	<i>Unspecified abortion</i>	09.02 Abortion-related death
		O08	<i>Complications following abortion and ectopic and molar pregnancy</i>	09.03 Pregnancy-induced hypertension
		O15	<i>Eclampsia</i>	09.04 Obstetric haemorrhage
		O20	<i>Haemorrhage in early pregnancy</i>	

		O60	Haemorrhage in early pregnancy	09.06 Pregnancy-related sepsis
		O72	Postpartum haemorrhage	09.99 Other and unspecified maternal cause
		O85	Puerperal sepsis	
		O95	Obstetric death of unspecified cause	
		O99	Other maternal diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium	
Non-communicable	Nil	D65	Disseminated intravascular coagulation [defibrination syndrome]	04.01 Acute cardiac disease 04.02 Stroke 04.99 Other and unspecified cardiac disease
		E15	Nondiabetic hypoglycaemic coma	05.01 Chronic obstructive pulmonary disease (COPD)
		G36	Other acute disseminated demyelination	05.02 Asthma
		G40	Epilepsy	06.01 Acute abdomen
		G41	Status epilepticus	08.01 Liver cirrhosis
		G81	Hemiplegia	98 Other and unspecified noncommunicable disease**
		I21	Acute myocardial infarction	99 Cause of death unknown
		I22	Subsequent myocardial infarction	
		I26	Pulmonary embolism	
		I30	Acute pericarditis	
		I46	Cardiac arrest	
		I60	Subarachnoid haemorrhage	
		I61	Intracerebral haemorrhage	

		I62	Other nontraumatic intracranial haemorrhage	
		I63	Cerebral infarction	
		I64	Stroke, not specified as haemorrhage or infarction	
		J44	Other chronic obstructive pulmonary disease	
		J45	Asthma	
		J46	Status asthmaticus	
		J36	Peritonsillar abscess	
		J96	Respiratory failure, not elsewhere classified	
		K25	Gastric ulcer	
		K26	Duodenal ulcer	
		K27	Peptic ulcer, site unspecified	
		K35	Acute appendicitis	
		K56	Paralytic ileus and intestinal obstruction without hernia	
		L00	Staphylococcal scalded skin syndrome	
		R04	Haemorrhage from respiratory passages	
		R10	Abdominal and pelvic pain	
		R56	Convulsions, not elsewhere classified	
	If > 30 years	R96	Other sudden death, cause unknown	
Injury	Nil	S09	Other and unspecified injuries of head	12.01 Road traffic accident
		S29	Other and unspecified injuries of thorax	12.02 Other transport accident

		S36	<i>Injury of intra-abdominal organs</i>	12.03 Accidental fall
		T65	<i>Toxic effect of other and unspecified substances</i>	12.04 Accidental drowning and submersion
		T29	<i>Burns and corrosions of multiple body regions</i>	12.05 Accidental exposure to smoke, fire and flames
		T51	<i>Toxic effect of alcohol</i>	12.06 Contact with venomous animals and plants
		T98	<i>Sequelae of other and unspecified effects of external causes</i>	12.07 Accidental poisoning and exposure to noxious substance
		V02	Pedestrian injured in collision with two- or three-wheeled motor vehicle	12.08 Intentional self-harm
		V03	Pedestrian injured in collision with car, pick-up truck or van	12.09 Assault
		V04	Pedestrian injured in collision with heavy transport vehicle or bus	12.10 Exposure to force of nature
		V05	Pedestrian injured in collision with railway train or railway vehicle	12.99 Other and unspecified external cause of death
		V09	Pedestrian injured in other and unspecified transport accidents	(98 Other and unspecified noncommunicable disease**)
		V13	<i>Pedal cyclist injured in collision with car, pick-up truck or van</i>	
		V14	Pedal cyclist injured in collision with heavy transport vehicle or bus	
		V23	Motorcycle rider injured in collision with car, pick-up truck or van	
		V24	Motorcycle rider injured in collision with heavy transport vehicle or bus	

	V27	Motorcycle rider injured in collision with other nonmotor vehicle
	V29	Motorcycle rider injured in other and unspecified
	V43	<i>Car occupant injured in collision with car, pick-up truck or van</i>
	V44	Car occupant injured in collision with heavy transport vehicle or bus
	V47	<i>Car occupant injured in collision with fixed or stationary object</i>
	V48	<i>Car occupant injured in noncollision transport accident</i>
	V49	<i>Car occupant injured in other and unspecified transport accidents</i>
	V53	<i>Occupant of pick-up truck or van injured in collision with car, pick-up truck or van</i>
	V54	Occupant of pick-up truck or van injured in collision with heavy transport vehicle or bus
	V58	<i>Occupant of pick-up truck or van injured in noncollision transport accident</i>
	V59	<i>Occupant of pick-up truck or van injured in other and unspecified transport accidents</i>
	V64	Occupant of heavy transport vehicle injured in collision with heavy transport vehicle or bus
	V68	Occupant of heavy transport vehicle injured in

			noncollision transport accident
		V74	Bus occupant injured in collision with heavy transport vehicle or bus
		V78	Bus occupant injured in noncollision transport accident
		V81	Occupant of railway train or railway vehicle injured in transport accident
		V83	Occupant of special vehicle mainly used on industrial premises injured in transport accident
		V85	Occupant of special construction vehicle injured in transport accident
		V87	Traffic accident of specified type but victim's mode of transport unknown
		V89	Motor- or nonmotor-vehicle accident, type of vehicle unspecified
		V90	Accident to watercraft causing drowning and submersion
		V99	Unspecified transport accident
		W01	Fall on same level from slipping, tripping and stumbling
		W06	Fall involving bed
		W10	Fall on and from stairs and steps
		W11	Fall on and from ladder

		W13	Fall from, out of or through building or structure	
		W14	Fall from tree	
		W17	Other fall from one level to another	
		W18	Other fall on same level	
		W19	Unspecified fall	
		W20	Struck by thrown, projected or falling object	
		W23	Caught, crushed, jammed or pinched in or between objects	
		W29	Contact with other powered hand tools and household machinery	
		W31	Contact with other and unspecified machinery	
		W34	Discharge from other and unspecified firearms	
		W49	Exposure to other and unspecified inanimate mechanical forces	
		W54	Bitten or struck by dog	
		W55	Bitten or struck by other mammals	
		W66	Drowning and submersion following fall into bath-tub	
		W67	Drowning and submersion while in swimming-pool	
		W69	Drowning and submersion while in natural water	

		W70	<i>Drowning and submersion following fall into natural water</i>	
		W73	<i>Other specified drowning and submersion</i>	
		W74	<i>Unspecified drowning and submersion</i>	
		W75	<i>Accidental suffocation and strangulation in bed</i>	
		W77	<i>Threat to breathing due to cave-in, falling earth and other substances</i>	
		W79	<i>Inhalation and ingestion of food causing obstruction of respiratory tract</i>	
		W80	<i>Inhalation and ingestion of other objects causing obstruction of respiratory tract</i>	
		W85	Exposure to electric transmission lines	
		W86	Exposure to other specified electric current	
		W87	Exposure to unspecified electric current	
		X00	Exposure to uncontrolled fire in building or structure	
		X01	<i>Exposure to uncontrolled fire, not in building or structure</i>	
		X03	<i>Exposure to controlled fire, not in building or structure</i>	
		X04	Exposure to ignition of highly flammable material	
		X05	Exposure to ignition or melting of nightwear	

		X06	Exposure to ignition or melting of other clothing and apparel	
		X08	Exposure to other specified smoke, fire and flames	
		X09	Exposure to unspecified smoke, fire and flames	
		X12	Contact with other hot fluids	
		X17	Contact with hot engines, machinery and tools	
		X19	Contact with other and unspecified heat and hot substances	
		X20	Contact with venomous snakes and lizards	
		X21	Contact with venomous spiders	
		X22	Contact with scorpions	
		X27	Contact with other specified venomous animals	
		X29	Contact with unspecified venomous animal or plant	
		X33	Victim of lightning	
		X34	Victim of earthquake	
		X37	Victim of cataclysmic storm	
		X39	Exposure to other and unspecified forces of nature	
		X40	Accidental poisoning by and exposure to nonopioid analgesics, antipyretics and antirheumatics	

		X45	<i>Accidental poisoning by and exposure to alcohol</i>	
		X46	<i>Accidental poisoning by and exposure to organic solvents and halogenated hydrocarbons and their vapours</i>	
		X48	Accidental poisoning by and exposure to pesticides	
		X49	Accidental poisoning by and exposure to other and unspecified chemicals and noxious substances	
		X50	<i>Overexertion and strenuous or repetitive movements</i>	
		X64	<i>Intentional self-poisoning by and exposure to other and unspecified drugs, medicaments and biological substances</i>	
		X65	<i>Intentional self-poisoning by and exposure to alcohol</i>	
		X68	<i>Intentional self-poisoning by and exposure to pesticides</i>	
		X69	<i>Intentional self-poisoning by and exposure to other and unspecified chemicals and noxious substances</i>	
		X70	<i>Intentional self-harm by hanging, strangulation and suffocation</i>	
		X71	<i>Intentional self-harm by drowning and submersion</i>	
		X72	<i>Intentional self-harm by handgun discharge</i>	

		X74	<i>Intentional self-harm by other and unspecified firearm discharge</i>	
		X76	<i>Intentional self-harm by smoke, fire and flames</i>	
		X80	<i>Intentional self-harm by jumping from a high place</i>	
		X81	<i>Intentional self-harm by jumping or lying before moving object</i>	
		X82	<i>Intentional self-harm by crashing of motor vehicle</i>	
		X83	<i>Intentional self-harm by other specified means</i>	
		X84	<i>Intentional self-harm by unspecified means</i>	
		X93	<i>Assault by handgun discharge</i>	
		X94	<i>Assault by rifle, shotgun and larger firearm discharge</i>	
		X95	Assault by other and unspecified firearm discharge	
		X97	<i>Assault by smoke fire, flames</i>	
		X98	<i>Assault by steam, hot vapours and hot objects</i>	
		X99	Assault by sharp object	
		Y00	Assault by blunt object	
		Y01	<i>Assault by pushing from high place</i>	
		Y03	<i>Assault by crashing of motor vehicle</i>	
		Y04	<i>Assault by bodily force</i>	

		Y05	<i>Sexual assault by bodily force</i>	
		Y08	Assault by other specified means	
		Y09	Assault by unspecified means	
		Y13	<i>Poisoning by and exposure to other drugs acting on the autonomic nervous system, undetermined intent</i>	
		Y14	<i>Poisoning by and exposure to other and unspecified drugs, medicaments and biological substances, undetermined intent</i>	
		Y18	<i>Poisoning by and exposure to pesticides, undetermined intent</i>	
		Y19	<i>Poisoning by and exposure to other and unspecified chemicals and noxious substances, undetermined intent</i>	
		Y20	<i>Hanging, strangulation and suffocation, undetermined intent</i>	
		Y21	<i>Drowning and submersion, undetermined intent</i>	
		Y22	<i>Handgun discharge, undetermined intent</i>	
		Y24	<i>Other and unspecified firearm discharge, undetermined intent</i>	
		Y30	<i>Falling, jumping or pushed from a high place, undetermined intent</i>	

		Y85	<i>Sequela of transport accidents</i>	
		R58	Haemorrhage, not elsewhere classified	

Normal type denotes condition classified as time-critical by Hsiao et al. (2013). Bold/italic type denotes conditions classified as time-critical by author consensus decision.

** Multiple ICD-10 codes in the non-communicable section and one ICD-10 code (R58 Haemorrhage, not elsewhere classified) in the injury section map(s) to the verbal autopsy code 98. Occurrences of the verbal autopsy code 98 in the dataset have been assigned to the non-communicable disease category; they have not been double counted by assigning to both the non-communicable disease and injury categories.

Table A2: Causes of death identified in dataset, by condition category

Category	Number of deaths	Percentage of total deaths in category / %
Maternal	112	
09.01 Ectopic pregnancy	2	1.79
09.02 Abortion-related death	8	7.14
09.03 Pregnancy-induced hypertension	26	23.21
09.04 Obstetric haemorrhage	66	58.93
09.06 Pregnancy-related sepsis	7	6.25
09.99 Other and unspecified maternal CoD	3	2.68
Non-communicable disease	2961	
04.01 Acute cardiac disease	225	7.60
04.02 Stroke	557	18.81
04.99 Other and unspecified cardiac dis	503	16.99
05.01 Chronic obstructive pulmonary dis	122	4.12
05.02 Asthma	113	3.82
06.01 Acute abdomen	113	3.82
08.01 Epilepsy	23	0.78
98 Other and unspecified NCD	165	5.57
99 Indeterminate	1140	38.50

Communicable	1483	
01.01 Sepsis (non-obstetric)	15	1.01
01.02 Acute resp infect incl pneumonia	1213	81.79
01.05 Malaria	146	9.84
01.07 Meningitis and encephalitis	109	7.35
Neonatal	287	
01.07 Meningitis and encephalitis	7	2.43
10.02 Birth asphyxia	56	19.51
10.03 Neonatal pneumonia	95	33.10
10.04 Neonatal sepsis	20	6.97
10.06 Congenital malformation	74	25.78
10.99 Other and unspecified neonatal CoD	35	12.20
Injury-related	1042	
12.01 Road traffic accident	420	40.31
12.02 Other transport accident	19	1.82
12.03 Accid fall	6	0.58
12.04 Accid drowning and submersion	34	3.26
12.05 Accid expos to smoke fire & flame	36	3.45
12.06 Contact with venomous plant/animal	2	0.19
12.07 Accid poisoning & noxious subs	12	1.15
12.08 Intentional self-harm	56	5.37
12.09 Assault	444	42.61
12.10 Exposure to force of nature	1	0.10
12.99 Other and unspecified external CoD	12	1.15

Table A3: Proportion of time-critical deaths attributable to condition category, by age group

Condition category	Age group							
	<10 n=924	≥10 to <20 n=184	≥20 to <30 n=458	≥30 to <40 n=837	≥40 to <50 n=686	≥50 to <60 n=622	≥60 to <70 n=636	≥70 n=1538
Maternal	0 (0%)	10 (5.43%)	32 (7.00%)	51 (6.09%)	19 (2.80%)	0 (0%)	0 (0%)	0 (0%)
NCD	0 (0%)	0 (0%)	0 (0%)	401 (47.91%)	375 (54.66%)	444 (71.38%)	476 (74.84%)	1265 (82.25%)
CD	556 (60.17%)	78 (42.39%)	137 (29.91%)	163 (19.47%)	139 (20.26%)	93 (14.95%)	106 (16.67%)	211 (13.72%)
Neonatal	287 (31.06%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Injury	81 (8.80%)	96 (52.17%)	289 (63.10%)	222 (26.52%)	153 (22.30%)	85 (13.67%)	54 (8.49%)	62 (40.31%)

NCD = Non-communicable disease

CD = Communicable disease

Table A4: Proportion of time-critical deaths attributable to condition category, by year

Condition category	Year of death						
	1993 n=133	1994 n=132	1995 n=154	1996 n=140	1997 n=123	1998 n=186	1999 n=182
Maternal	2 (1.50%)	2 (1.52%)	1 (0.65%)	1 (0.71%)	0 (0%)	3 (1.61%)	1 (0.55%)
NCD	65 (48.87%)	61 (46.21%)	88 (57.14%)	88 (62.86%)	62 (50.41%)	102 (54.84%)	84 (46.15%)
CD	26 (19.55%)	22 (16.67%)	27 (17.53%)	23 (16.43%)	25 (20.33%)	26 (13.98%)	44 (24.18%)
Neonatal	8 (6.02%)	8 (6.06%)	4 (2.60%)	4 (2.86%)	8 (6.50%)	10 (5.38%)	14 (7.69%)
Injury	32 (24.06%)	39 (29.55%)	34 (22.08%)	24 (17.14%)	28 (22.76%)	45 (24.19%)	39 (21.43%)

Condition category	Year of death						
	2000 n=182	2001 n=182	2002 n=222	2003 n=247	2004 n=221	2005 n=268	2006 n=295
Maternal	2 (1.10%)	2 (1.10%)	2 (0.90%)	5 (2.02%)	2 (0.91%)	7 (2.61%)	4 (1.36%)
NCD	102 (56.04%)	93 (51.10%)	111 (50.00%)	127 (51.42%)	116 (52.49%)	164 (61.19%)	143 (48.48%)
CD	41 (22.53%)	47 (25.82%)	42 (18.92%)	49 (19.84%)	50 (22.62%)	38 (14.18%)	74 (25.08%)
Neonatal	12 (6.59%)	8 (4.40%)	11 (5.00%)	13 (5.26%)	6 (2.72%)	20 (7.46%)	18 (6.10%)
Injury	25 (13.74%)	32 (17.58%)	56 (25.23%)	53 (21.46%)	47 (21.27%)	39 (14.55%)	56 (18.98%)

Condition category	Year of death						
	2007 n=315	2008 n=359	2009 n=334	2010 n=340	2011 n=333	2012 n=334	2013 n=398
Maternal	4 (1.27%)	7 (1.95%)	4 (1.20%)	6 (1.76%)	4 (1.20%)	15 (4.49%)	12 (3.02%)
NCD	165 (52.38%)	154 (42.90%)	170 (50.90%)	171 (50.29%)	169 (50.75%)	157 (47.01%)	197 (49.50%)
CD	88 (27.94%)	113 (31.48%)	105 (31.44%)	98 (28.82%)	90 (27.03%)	102 (30.54%)	108 (27.14%)
Neonatal	17 (5.40%)	30 (8.36%)	18 (5.40%)	23 (6.77%)	18 (5.41%)	7 (2.10%)	12 (3.02%)
Injury	41 (13.02%)	55 (15.32%)	37 (11.08%)	42 (12.35%)	52 (15.62%)	53 (15.87%)	69 (17.34%)

Condition category	Year of death	
	2014 n=418	2015 n=387
Maternal	11 (2.63%)	15 (3.88%)
NCD	196 (46.89%)	176 (45.48%)
CD	126 (30.14%)	119 (30.75%)
Neonatal	11 (2.63%)	7 (1.81%)
Injury	74 (17.70%)	70 (18.09%)

NCD = Non-communicable disease

CD = Communicable disease

Table A5: Cause of death in time-critical deaths with CoM indicator of discharged whilst ill

Cause of death	Number of deaths	Percentage
01.01 Sepsis (non-obstetric)	1	1.49
01.02 Acute resp infect incl pneumonia	16	23.88
01.05 Malaria	1	1.49
01.07 Meningitis and encephalitis	1	1.49
04.01 Acute cardiac disease	2	2.99
04.02 Stroke	21	31.34
04.99 Other and unspecified cardiac dis	13	19.4
05.01 Chronic obstructive pulmonary dis	3	4.48
06.01 Acute abdomen	4	5.97
09.04 Obstetric haemorrhage	1	1.49
12.09 Assault	1	1.49
98 Other and unspecified NCD	1	1.49
99 Indeterminate	2	2.99