

Table S1. Groups of causes used in the Multiple Correspondence Analysis an number of deaths at ages 50-89 with obesity as UC or CC that have a mention of these groups - France, Italy, United States, 2010-2011

#	ICD-10 codes	Deaths at ages 50-89 with obesity as UC or CC that have a mention of the group			
		France %	Italy %	U.S. %	
<b>Infectious and parasitic diseases</b>					
1	Tuberculosis	A15-A19, B90	26 0%	8 0%	5 0%
2	AIDS (HIV-disease)	B20-B24	3 0%	1 0%	40 0%
3	Viral hepatitis	B15-B19, B94.2	37 0%	81 1%	322 1%
4	Septicaemia	A40-A41	1074 10%	841 9%	3107 7%
5	Intestinal infectious diseases	A00-A09	72 1%	13 0%	231 1%
6	Other infectious and parasitic diseases	(A00-B99), U01-U4, U80-U89 except Supra 'A' and 'B'	365 4%	62 1%	438 1%
<b>Neoplasms</b>					
7	Malignant neoplasm of lip, oral cavity, pharynx	C00-C14	10 0%	6 0%	25 0%
8	Malignant neoplasm of oesophagus	C15	17 0%	3 0%	36 0%
9	Malignant neoplasm of stomach	C16	18 0%	31 0%	30 0%
10	Malignant neoplasm of small intestine, colon, rectum and anus, and other/ill-defined digestive organs	C17,C18,C19, C20, C21,C26	170 2%	106 1%	309 1%
11	Malignant neoplasm of liver, the intrahepatic bile ducts, gallbladder and other unspecified parts of biliary tract	C22, C23 ,C24	106 1%	67 1%	124 0%
12	Malignant neoplasm of pancreas	C25	45 0%	40 0%	119 0%
13	Malignant neoplasm of larynx and trachea/bronchus/lung	C32-C34	176 2%	146 2%	417 1%
14	Malignant melanoma of skin	C43	16 0%	13 0%	39 0%
15	Malignant neoplasm of skin	C44	6 0%	4 0%	23 0%
16	Malignant neoplasm of breast	C50	157 2%	124 1%	320 1%
17	Malignant neoplasm of cervix uteri and other parts of uterus	C53-C55	76 1%	61 1%	223 1%
18	Malignant neoplasm of ovary	C56	32 0%	12 0%	79 0%
19	Malignant neoplasm of prostate	C61	93 1%	39 0%	200 0%
20	Malignant neoplasm of kidney	C64	34 0%	22 0%	133 0%
21	Malignant neoplasm of bladder	C67	35 0%	20 0%	84 0%
22	Malignant neoplasm of lymph./haematopoietic tissue	C81-C96	133 1%	104 1%	275 1%
23	Malignant neoplasm of eye, brain and other parts of central nervous system	C69-C72	22 0%	16 0%	47 0%
24	Secondary malignant neoplasm	C77-C79	375 4%	225 3%	271 1%
25	Malignant neoplasm of ill-defined/unspecified/ independent (primary) multiple sites	C76, C80, C97	162 2%	169 2%	304 1%
26	Other malignant neoplasms	(C00-C99) except Supra 'C' codes	49 0%	49 1%	107 0%
27	Benign neoplasms, In situ neoplasms and neoplasms of uncertain or unknown behaviour	D00 - D48	149 1%	177 2%	195 0%
28	<b>Diseases of the blood(-forming organs), immunological disorders</b>	D50-D89	207 2%	327 4%	1229 3%
<b>Endocrine, nutritional and metabolic diseases</b>					
29	Diabetes mellitus	E10-E14	3778 37%	3546 40%	17282 40%
30	Malnutrition and other nutritional deficiencies	E40-E64	116 1%	22 0%	179 0%
31	<b>Obesity</b>	E66	10233 100%	8882 100%	42728 100%
32	Disorders of thyroid gland	E00-E07	196 2%	286 3%	711 2%
33	Other endocrine, nutritional and metabolic diseases	(E00-E90) except Supra 'E' codes	1112 11%	903 10%	5179 12%
<b>Mental and behavioural disorders</b>					
34	Alcoholic psychosis/chronic alcohol abuse	F10.1 to F10.9, G31.2	413 4%	50 1%	907 2%
35	Drug dependence, toxicomania	F11-F16 except F11.0, F12.0,F13.0, F14.0, F15.0, F16.0 F18-F19 except F18.0, F19.0	5 0%	5 0%	466 1%
36	Dementias (excluding Alzheimer)	F01, F03, G31.0, G31.1, G31.8, G31.9	137 1%	123 1%	579 1%
37	Other mental and behavioural disorders	(F00-F99) except F10.0, F11.0, F12.0, F13.0, F14.0, F15.0, F16.0, F17.0, F18.0, F19.0 and Supra 'F' codes	1045 10%	475 5%	7345 17%
<b>Diseases of the nervous system</b>					
38	Epilepsia	G40-G41	95 1%	77 1%	49 0%
39	Alzheimer's disease	G30	85 1%	36 0%	159 0%
40	Parkinson's disease	G20, G21	52 1%	72 1%	109 0%
41	Other diseases of the nervous system	(G00-G98) except G31.0, G31.1, G31.2, G31.8, G31.9 and Supra 'G' codes	1244 12%	500 6%	6124 14%
<b>Diseases of the circulatory system</b>					
42	Ischemic heart diseases	I20-I25	2387 23%	2746 31%	16020 37%
43	Other heart diseases	I00-I09, I30-I33, I39-I45, I47-I48, I49 except I49.0 and I50-I52	3633 36%	3836 43%	13144 31%
44	Cerebrovascular diseases	I60-I69	903 9%	1158 13%	1842 4%
45	Hypertensive diseases	I10-I15	3973 39%	4226 48%	18942 44%
46	Other diseases of the circulatory system	(I00-I99) except I46, I49.0, I95.9, I99 and Supra 'I' codes	2026 20%	1519 17%	6425 15%
<b>Diseases of the respiratory system</b>					
47	Influenza	J10-J11	15 0%	10 0%	21 0%
48	Pneumonia	J12-J18	785 8%	541 6%	2518 6%
49	Other acute lower respiratory diseases	J00-J09, J19-J22	134 1%	47 1%	66 0%
50	Asthma	J45-J46	162 2%	72 1%	924 2%
51	Other chronic lower respiratory diseases	J40-J44	1152 11%	2209 25%	7837 18%
52	Lung diseases due to external agents	J60-J70	143 1%	56 1%	465 1%
53	Other diseases of the respiratory system	(J00-J99) except J96.0, J96.9 and Supra 'J' codes	1401 14%	1317 15%	2615 6%
<b>Diseases of the digestive system</b>					
54	Ulcer of stomach, duodenum and jejunum	K25-K28	62 1%	54 1%	127 0%
55	Chronic liver disease	K70, K73-K74	333 3%	183 2%	892 2%
56	Other diseases of the digestive system	(K00-K93) except Supra 'K' codes	1094 11%	969 11%	2941 7%
57	<b>Diseases of the skin and subcutaneous tissue</b>	L00-L99	328 3%	263 3%	1153 3%
<b>Diseases of the musculoskeletal system/connective tissue</b>					
58	Rheumatoid arthritis and osteoarthritis	M05-M06, M15-M19	98 1%	237 3%	700 2%
59	Other diseases of the musculoskeletal system/connective tissue	(M00-M99) except Supra 'M' codes	293 3%	207 2%	1196 3%
<b>Diseases of the genitourinary system</b>					
60	Renal Failure	N17-N19	1335 13%	1961 22%	5316 12%
61	Other diseases of kidney and ureter	N00-N16	87 1%	23 0%	637 1%
62	Hyperplasia of prostate	N40	12 0%	39 0%	73 0%
63	Other diseases of the genitourinary system	(N00-N99) except Supra 'N' codes	183 2%	182 2%	1090 3%
64	<b>Other diseases</b>	O00-O99, (P00-P96) except P28.5, Q00-Q99, H00- H59, H60- H95, R95	68 1%	83 1%	185 0%
<b>Other Symptoms, signs, abnormal findings, ill-defined causes</b>					
65	Senility	R54	0 0%	68 1%	0 0%
66	Mechanisms of the death °	I46, I49.0, R09.2, R40.2, R57 (R00-R94), (R96-R99), I95.9, I99,	0 0%	0 0%	70 0%
67	Other symptoms, signs, abnormal findings, ill-defined causes°°	J96.0, J96.9, P28.5, U00 except Supra "R" codes	0 0%	0 0%	6 0%
<b>External causes</b>					
68	Transport accidents	V01-V99, Y85	35 0%	17 0%	245 1%
69	Accidental falls	W00-W19	117 1%	45 1%	456 1%
70	Accidental poisoning	X40-X49	66 1%	5 0%	837 2%
71	Suicide/intentional self-harm	X60-X84	41 0%	2 0%	76 0%
72	Other external causes	S, T, V, W, X Y codes except Supra codes, F10.0, F11.0, F12.0, F13.0, F14.0, F15.0, F16.0, F17.0, F18.0, F19.0	1005 10%	535 6%	3314 8%

UC: Underlying cause CC: Contributing cause

°) Cardiac arrest (I46), Ventricular fibrillation (I49.0), Respiratory arrest (R09.2), Coma (R40.2), Shock (R57)

°°) Hypotension (I95.9), Other unspecified disorders of circulatory system (I99), Acute respiratory failure (J96.0), Respiratory failure unspecified (J96.9), Respiratory failure of newborn (P28.5)

**Table S2. Clusters resulting from the Multiple Correspondence Analyses: pooled analysis and country-specific analyses. Deaths at ages 50-89 years with any mention of obesity. France, Italy and the United States, 2010-2011**

Pooled analysis	France	Italy	U.S.
Cluster 1/9 (16%)	<b>Obesity UC 75%</b> Other respiratory diseases 32% (17%)	<b>Obesity UC 98%</b> (12%)	<b>Obesity UC 92%</b> Other nervous diseases 27% (13%)
Cluster 2/9 (24%)	<b>Obesity CC 90% Other endocrine or metabolic diseases 94% Hypertension 70%</b> Diabetes 48% Ischemic heart diseases 47% (8%)	<b>Obesity CC 98% Ischemic heart diseases 65% Hypertension 64% Diabetes 56%</b> Other endocrine or metabolic diseases 24% (21%)	<b>Obesity CC 97% Hypertension 83% Ischemic heart diseases 77%</b> Diabetes 70% Other endocrine or metabolic diseases 33% (19%)
Cluster 3/9 (18%)	<b>Obesity CC 98% Other heart diseases 53% Diabetes 53%</b> Hypertension 46% Ischemic heart diseases 39% Other diseases of the circulatory system 25% (29%)	<b>Obesity CC 98% Other heart diseases 75%</b> Chronic lower respiratory diseases 48% Renal failure 32% Other respiratory diseases 25% (25%)	<b>Obesity CC 96% Other heart diseases 75% Diabetes 68%</b> Other diseases of the circulatory system 39% Renal failure 39% (12%)
Cluster 4/9 (8%)	<b>Obesity CC 92% Cerebrovascular diseases 86% Hypertension 62%</b> Diabetes 45% Other nervous diseases 32% (9%)	<b>Obesity CC 92% Cerebrovascular diseases 77% Hypertension 67%</b> Other nervous diseases 36% (11%)	<b>Obesity CC 89% Cerebrovascular diseases 100% Hypertension 60%</b> Diabetes 49% (4%)
Cluster 5/9 (12%)	<b>Obesity CC 82% Skin diseases 57%</b> Other infectious diseases 48% Septicemia 41% Renal failure 21% (5%)	<b>Obesity CC 96% Pneumonia 49% Septicemia 59%</b> Diabetes 45% Renal failure 37% Chronic lower respiratory diseases 36% (10%)	<b>Obesity CC 85% Septicemia 69%</b> Diabetes 43% Skin diseases 36% Renal failure 32% Other genitourinary diseases 26% Other digestive diseases 23% (7%)
			<b>Obesity CC 79% Pneumonia 60% Other respiratory diseases 52%</b> Chronic lower respiratory diseases 28% Other nervous diseases 24% Renal failure 21% (8%)
Cluster 6/9 (9%)	<b>Obesity CC 79% Mental disorders 84%</b> Alcoholic psychosis-chronic alcohol abuse 31% Chronic lower respiratory diseases 22% (9%)	<b>Obesity CC 95% Mental disorders 58%</b> Disorders of thyroid gland 46% (6%)	<b>Obesity CC 91% Chronic lower respiratory diseases 68%</b> Ischemic heart diseases 45% Mental disorders 17% (15%)
Cluster 7/9 (8%)	<b>Obesity CC 94% External causes 80%</b> Other diseases of the circulatory system 36% Other digestive diseases 27% (9%)	-	<b>Obesity CC 97% External causes 30%</b> (18%)
Cluster 8/9 (3%)	<b>Obesity CC 91% Chronic liver disease 88% Other digestive diseases 54%</b> Alcoholic psychosis-chronic alcohol abuse 31% Septicaemia 20% (4%)	<b>Obesity CC 94% Other digestive diseases 85%</b> Renal failure 33% Chronic liver disease 27% Septicaemia 27% (8%)	<b>Obesity CC 87% Chronic liver disease 92%</b> Other digestive diseases 48% Alcoholic psychosis-chronic alcohol abuse 21% (2%)
Cluster 9/9 (2%)	<b>Obesity CC 98%</b> Septicaemia 38% Pneumonia 35% Secondary neoplasm 30% Other digestive diseases 26% Other respiratory diseases 22% (11%)	<b>Obesity CC 99% Secondary neoplasm 100%</b> (3%)	-
Country-specific clusters	-	-	<b>Obesity CC 82% Asthma 100%</b> Hypertension 52% Other nervous diseases 23% (2%)
	-	<b>Obesity CC 87% Rheumatoid arthritis and osteoarthritis 55%</b> Other musculoskeletal diseases 48% (5%)	-

UC: Underlying cause CC: Contributing cause

Reading note: 17% of all deaths at ages 50-89 years with any mention of obesity in France are included in the first cluster. For 75% of those deaths obesity is the underlying cause. Groups of causes that are mentioned on more than 50% of the death certificates of a cluster are in bold. Note that the percentages in a cluster add up to more than 100 because several groups of causes can be simultaneously listed on a death certificate.