

Appendix: disease and health care provider categories in PAID 1.0

Table A1: summary of health care provider categories in PAID 1.0 (based on the categories distinguished in the Dutch Costs of Illness study)

Cost of Illness System of Health Account	% of total costs in 2005	Data utilized to attribute average costs per disease to last year of life and other years
Health care provider categories		
Hospitals (HC)	38.5	Hospital records linkage
Providers of ambulatory health care (GP)	22.3	Hospital records scaled to insurance claims
Retail sale and other providers of medical goods* (Med)	16	Hospital records scaled to insurance claims
Nursing and residential care facilities (LTC)	11.7	Hospital records scaled to insurance claims
General health administration and insurance**	4.8	Not applicable***
Other industries (rest of the economy)**	3.8	Not applicable***
Provision and administration of public health programmes**	1.6	Not applicable***
Other providers**	1.3	Not applicable***

** mainly drugs and appliance*

***these health care providers are grouped together in PAID 1.0 and are referred to as 'all other health care providers'*

**** costs for 'all other health care providers' depend on age and gender only in PAID 1.0*

Table A2: summary of disease categories in PAID 1.0 (based on the categories distinguished in the Dutch Costs of Illness study)

Cost of Illness System of Health Account Disease categories	International Statistical Classification of Diseases and Related Health Problems (ICD) - 9 codes	Matched disease-specific ratios estimated using International Shortlist for Hospital Morbidity Tabulation (ISHMT) classification (ICD-9 codes between brackets)	% of total costs in 2005
<i>Infectious and parasitic disease</i>			2.5
Intestinal infectious diseases	001-009	- r001 (001-008) - r002 (009)	3.6
Tuberculosis	010-018, 137	- r003 (010-018, 137)	4.4
Meningitis	036, 047, 320-322	- r006 (remainder of 001-139, except 0340, 0993, 0994, 135, 1361)	2.3
Septicemia	038	- r004 (038)	3.9
HIV/AIDS	042-044	- r005 (042-044 or 2795, 2796)	2.2
Sexually transmitted diseases	054, 078, 090-099	- r006 (remainder of 001-139, except 0340, 0993, 0994, 135, 1361)	3.8
Hepatitis	070, 573.1	- r006 (remainder of 001-139, except 0340, 0993, 0994, 135, 1361) - r072 (570, 571.4-573)	1.2
Other infectious diseases	019-035, 037, 039-041, 045- 046, 048-053, 055-069, 071- 077, 079-089, 100-136, 138- 139, v01-v07, v73-v75	- r006 (remainder of 001-139, except 0340, 0993, 0994, 135, 1361) - r130 (remainder of V01-V82)	78.6
<i>Neoplasms</i>			5.2
Esophagus cancer	150	- r015 (remainder of 140-208)	1.8
Stomach cancer	151	- r015 (remainder of 140-208)	1.8
Colorectal cancer	153-154	- r007 (153, 154)	10.8
Pancreas cancer	157	- r015 (remainder of 140-208)	1.7
Lung cancer	162	- r008 (162)	7.5
Breast cancer	174	- r010 (174,175)**	9.6
Cervical cancer	180	- r011 (179,180,182)**	2.1
Ovary cancer	183	- r012 (183)**	1.4
Prostate cancer	185	- r013 (185)*	4.0
Other cancers genital organs	179, 181-182, 184, 186-187	- r011 (179,180,182)** - r015 (remainder of 140-208)	1.7
Bladder and kidney cancer	188-189	- r014 (188) - r015 (remainder of 140-208)	4.1
Non-Hodgkin's disease	200, 202	- r015 (remainder of 140-208)	3.5
Other lymphoid cancer and leukemia	201, 203-208	- r015 (remainder of 140-208)	5.3
Other cancers	140-149, 152, 155-156, 158- 161, 163-172, 175-178, 190- 199, 209, v76	- r015 (remainder of 140-208) - r010 (174,175)** - r130 (remainder of V01-V82)	28.3

Benign neoplasms of genital organs	217-222	-	r018 (218)**	3.9
Other benign neoplasms	173, 210-216, 223-239	-	r019 (remainder of 210-239) r009 (172,173) r016 (230-234) r017 (2113,2114) r019 (remainder of 210-239)	12.5
<i>Endocrine, nutritional and metabolic diseases</i>				2.5
Diabetes mellitus including diabetic complications	250, 357.2, 362.0, 581.8, 582.8, 583.8	-	r022 (250) r034 (remainder of 320-359) r036 (remainder of 360-379) r090 (580-5834, 5838, 5839, 5900-5902, 5908, 5909, 591, 5933-5935, 5937, 5996) r099 (remainder of 580-629 except 5997)	65.0
Other endocrine, nutritional and metabolic diseases	240-249, 251-279, V77	-	r023 (remainder of 240-278) r130 (remainder of V01-V82)	35.0
<i>Diseases of the blood and the blood-forming organs</i>				0.4
Diseases of the blood and blood-forming organs	280-289, V78	-	r020 (280-285) r021 (135, 2790-2793, 2798, 286-288, 2890, 2894-2899) r130 (remainder of V01-V82)	100.0
<i>Mental and behavioral disorders</i>				16.0
Dementia	290, 311	-	r024 (2900-2902, 2904-2909, 2941) r028 (296, 2980, 3004, 3011, 311)	32.1
Schizophrenia	295	-	r027 (295, 2970-2973, 2978-2979, 2983-2989)	5.8
Psychotic disorders excluding schizophrenia	297-298	-	r027 (295, 2970-2973, 2978-2979, 2983-2989)	2.2
Depression	296, 300.4	-	r028 (296, 2980, 3004, 3011, 311)	9.1
Anxiety	300.0, 300.10-300.15, 300.2-300.3, 300.5, 308, 309.8	-	r029 (remainder of 290-319)	3.5
Personality disorders	300.16-300.19, 301	-	r028 (296, 2980, 3004, 3011, 311) r029 (remainder of 290-319)	2.0
Alcohol and drugs	291-292, 303-305	-	r025 (291, 303, 3050) r026 (292, 2940, 304, 3051-3059)	4.6
Other mental disorders	293-294, 299, 300.6-300.9, 302, 306-307, 309.0-309.7, 309.9, 310, 312-316, v79	-	r024 (2900-2902, 2904-2909, 2941) r026 (292, 2940, 304, 3051-3059) r029 (remainder of 290-319) r130 (remainder of V01-V82)	33.5
Mental retardation, including Down's syndrome	317-319, 758.0	-	r029 (remainder of 290-319) r110 (740-759)	7.2
<i>Diseases of the</i>				7.2

<i>nervous system</i>				
Parkinson's disease	332	-	r034 (remainder of 320-359)	4.3
Multiple sclerosis	340	-	r031 (340)	3.3
Epilepsy	345	-	r032 (345)	6.3
Cataract	366	-	No estimate	8.3
Disorders of accommodation and refraction	367	-	r036 (remainder of 360-379)	26.1
Blindness and low vision	369	-	r036 (remainder of 360-379)	2.3
Conjunctivitis	373-374	-	r036 (remainder of 360-379)	3.2
Other diseases of the eye and adnexa	360-361, 362.1-362.9, 363-365, 368, 370-372, 375-379	-	r036 (remainder of 360-379)	10.6
Ear disorders	380-389	-	No estimate	19.1
Other diseases of the nervous system and sense organs	323-331, 333-339, 341-344, 346-356, 357.0-357.1, 357.3-357.9, 358-359, v80	-	r030 (3310) r034 (remainder of 320-359) r130 (remainder of V01-V82)	16.5
<i>Diseases of the circulatory system</i>				10.1
Hypertension	401-405	-	r038 (401-405)	13.8
Coronary heart disease	410-414	-	r039 (413; ICD-9-CM: 4111, 413) r040 (410) r041 (411-412, 414; ICD-9-CM: 4110, 4118, 412, 414)	25.9
Heart failure	428-429	-	r044 (428) r048 (2891-2893, remainder of 390-459 except 435, 446 and 4590)	7.3
Other heart disease, including pulmonary circulation	390-398, 415-427	-	r048 (2891-2893, remainder of 390-459 except 435, 446 and 4590) r042 (415-417) r043 (426, 427)	13.3
Stroke	430-438	-	r033 (435) r045 (430-434, 436-438)	26.5
Diseases of arteries	440-448	-	r046 (440) r048 (2891-2893, remainder of 390-459 except 435, 446 and 4590)	6.7
Other circulatory diseases	451-459	-	No estimate r048 (2891-2893, remainder of 390-459 except 435, 446 and 4590)	6.5
<i>Diseases of the respiratory system</i>				4.5
Acute upper respiratory infections	460-466	-	r049 (0340, 460-465, 487; ICD-9-CM: 340, 460-465, 487, 488) r051 (466 (acute lower respiratory infections other than acute bronchitis, acute bronchiolitis and pneumonia were not separated in ICD-9, no J22 equivalent))	14.9

Pneumonia and influenza	480-487	- r050 (480-486) - r049 (0340, 460-465, 487; ICD-9-CM: 340, 460-465, 487, 488)	19.1
Asthma and chronic obstructive pulmonary disease (COPD)	490-496	- r054 (490-492, 494, 496) - r055 (493) - r056 (remainder of 460-519)	35.7
Other respiratory diseases	467-479, 488-489, 497-519	- r049 (0340, 460-465, 487; ICD-9-CM: 340, 460-465, 487, 488) - No estimate - r053 (470-473, 475-478) - r056 (remainder of 460-519)	30.4
<i>Diseases of the digestive system</i>			9.3
Dental caries	521.0	- r057 (520-525)	35.3
Periodontitis	523	- r057 (520-525)	3.4
Loss of teeth	525.1	- r057 (520-525)	10.6
Orthodontia	V58.5	- r129 (V071, V58)	6.2
Other diseases of teeth, jaw and salivary glands	520, 521.1-521.9, 522, 524, 525.0, 525.2-525.9, 526-529	- r057 (520-525) - r058 (526-529)	3.9
Gastroduodenal ulcers	531-534	- r060 (531-534)	1.2
Appendicitis	540-543	- r062 (540-543)	1.8
Abdominal hernia	550-553	- r063 (550) - r064 (551-553) - r065(555, 556)	4.2
Inflammatory intestinal disease	555-556	- r066 (558)	12.4
Other intestinal diseases	557-569	- r067 (560) - r068 (562) - r069 (565, 566, 5690-5694) - r070 (557, 564, 5695, 5698, 5699) - r071 (5710-5713) - r072 (570, 5714-573) - r072 (570, 5714-573) - r076 (remainder of 520-579)	0.7
Chronic liver disease and cirrhosis	571	- r072 (570, 5714-573)	0.5
Other liver diseases	570, 572, 573.0, 573.2-573.9	- r076 (remainder of 520-579)	4.5
Gallbladder diseases	574-576	- r073 (574) - r074 (575, 576)	12.7
Other diseases of the digestive system	530, 535-537, 577-579	- r059 (530) - r061 (535-537) - r075 (577) - r076 (remainder of 520-579)	3.5
<i>Diseases of the genitourinary system</i>			3.5
Nephritis and nephropathy	580, 581.0-581.7, 581.9, 582.0-582.7, 582.9, 583.0-583.7, 583.9, 584-589	- r090 (580-5834, 5838, 5839, 5900-5902, 5908, 5909, 591, 5933-5935, 5937, 5996) - r091 (5836, 5837, 584-586) - r093 (0994, 587-589, 5903, 5930-5932, 5936, 5938, 5939, 595- 597, 5980, 5981, 5988, 5989, 5990-5995, 5998, 5999, 6256)	10.0
Acute renal and urinary infections	590, 595, 597, 599.0	- r090 (580-5834, 5838, 5839, 5900-5902, 5908, 5909, 591, 5933-5935, 5937, 5996) - r093 (0994, 587-589, 5903,	11.1

			5930-5932, 5936, 5938, 5939, 595- 597, 5980, 5981, 5988, 5989, 5990-5995, 5998, 5999, 6256)	
Other renal and urinary diseases	591-594, 596, 598, 599.1-599.9	-	r090 (580-5834, 5838, 5839, 5900-5902, 5908, 5909, 591, 5933-5935, 5937, 5996) - r092 (592, 594, 7880) - r093 (0994, 587-589, 5903, 5930-5932, 5936, 5938, 5939, 595- 597, 5980, 5981, 5988, 5989, 5990-5995, 5998, 5999, 6256)	32.1
Hyperplasia of prostate	600	-	r094 (600)*	6.0
Other disorders of male genital organs	601-608	-	No estimate	4.5
Disorders of female genital organs	610-627, 629	-	No estimate - No estimate - No estimate - No estimate	31.8
Female infertility	628, v26	-	No estimate - No estimate	4.5
<i>Pregnancy, childbirth and the puerperium</i>				2.9
Pregnancy	630-648, V22-V23	-	No estimate - No estimate - No estimate - No estimate - No estimate	29.9
Childbirth	650-669, V20, V27, V30-V39	-	No estimate - No estimate - No estimate - No estimate - No estimate - No estimate - No estimate - No estimate	30.9
Puerperium	670-676, V24	-	No estimate - No estimate - No estimate	26.8
Contraception	V25	-	No estimate	12.4
<i>Diseases of the skin and subcutaneous tissue</i>				1.7
Eczema	691-692	-	r078 (690-693, 6943, 696-6983, 6988, 6989)	17.9
Decubitus	707	-	r079 (remainder of 680-709)	9.3
Other diseases of the skin and subcutaneous tissue	680-690, 693-706, 708-709	-	r077 (680-686) - r078 (690-693, 6943, 696-6983, 6988, 6989) - r079 (remainder of 680-709)	72.8
<i>Diseases of the musculoskeletal system and connective tissue</i>				7.6
Rheumatoid arthritis	714	-	r083 (0993, 711-716, 718, 719, 7271, 7284)	5.2
Osteoarthritis	715	-	r080 (Not a concept in ICD-9 at four-digit level. Can only be defined by using the optional fifth digit 5 to 715, i.e. 715.15, 715.25, 715.35 and 715.95)	13.2

		-	r081 (Not a concept in ICD-9 at four-digit level. Can only be defined by using the optional fifth digit 6 to 715, i.e. 715.16, 715.26, 715.36 and 715.96)	
		-	r083 (0993, 711-716, 718, 719, 7271, 7284)	
Dorsopathy	720-724	-	r085 (720, 721, 7230, 7235, 7240, 737)	23.3
		-	r086 (7220-7227, 7229)	
		-	r087 (7231, 7234, 7236, 7241-7243, 7245)	
Osteoporosis	733.0-733.1	-	r089 (remainder of 710-739)	3.0
Internal derangement of the knee	717	-	r083 (717)	4.7
Unspecified musculoskeletal diseases or conditions	725-729	-	r083 (0993, 711-716, 718, 719, 7271, 7284)	25.0
		-	r084 (1361, 2794, 446, 710, 725, 7285)	
		-	r086 (7220-7227, 7229)	
		-	r088 (726, 7270, 7272-7279)	
		-	r088 (7280-7283, 7286-7289, 729)	
Other diseases of the musculoskeletal system	710-713, 716, 718-719, 730-732, 733.2-733.9, 734-739	-	r083 (0993, 711-716, 718, 719, 7271, 7284)	25.7
		-	r084 (1361, 2794, 446, 710, 725, 7285)	
		-	r089 (remainder of 710-739)	
<i>Congenital malformations</i>				0.7
Congenital anomalies of nervous system	740-742	-	No estimate	4.8
Congenital anomalies of circulatory system	745-747	-	No estimate	23.4
Other congenital anomalies, excluding Down's syndrome	743-744, 748-757, 758.1-758.9, 759, v28	-	No estimate	71.7
		-	No estimate	
<i>Certain conditions originating in the perinatal period</i>				0.7
Disorders relating to premature birth	765	-	No estimate	41.9
Selected conditions in newborns	764, 768, 771	-	No estimate	14.4
Other conditions originating in the perinatal period	760-763, 766-767, 769-770, 772-779	-	No estimate	43.7
<i>Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified</i>				10.0
Symptoms, signs and ill-defined conditions	780-799	-	No estimate	100.0
		-	No estimate	
		-	No estimate	
		-	No estimate	
<i>Injury, poison and certain other consequences of external causes</i>				3.4

Skull-brain injury	800-801, 803-804, 850-854, 950-951	-	No estimate	6.2
		-	No estimate ,	
Fractures of upper extremities	810-819	-	No estimate	6.3
Hip fracture	820-821	-	No estimate	21.2
Other lower extremity fracture	822-829	-	No estimate	13.1
Superficial injury	910-924	-	No estimate	3.1
		-	No estimate	
Other injury	802, 805-809, 830-849, 855-909, 925-949, 952-999	-	No estimate	50.2
		-	No estimate	
		-	No estimate	
		-	No estimate	
		-	No estimate	
Not allocated/ Not disease related				11.7
Not allocated	V10-V19, V21, V40-V57, V58.0-V58.4, V58.6-V58.9, V63-V64, V66-V68, V71-V72, V81-V82	-	No estimate	91.6
Not disease-related	V59-V62, V65, V70	-	No estimate	8.4

**disease-specific ratio only estimated for men*

***disease-specific ratio only estimated for women*

No estimate: no disease-specific ratio found for both men and women