



National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport

State of Infectious Diseases
in the Netherlands, 2016

Appendix



Appendix

Updated disease burden model parameters

Table A.1 Updated life expectancies (Source: http://www.who.int/healthinfo/statistics/GlobalDALYmethods_2000_2011.pdf)

Age-group (years)	West Level 26* (previously used)		GBD 2010 (currently used)
	Males	Females	Persons
1–4	77.77	80.28	83.63
5–9	72.89	75.47	78.76
10–14	67.91	70.51	73.79
15–19	62.93	65.55	68.83
20–24	57.95	60.63	63.88
25–29	52.99	55.72	58.94
30–34	48.04	50.83	54.00
35–39	43.10	45.96	49.09
40–44	38.20	41.13	44.23
45–49	33.38	36.36	39.43
50–54	28.66	31.68	34.72
55–59	24.07	27.10	30.10
60–64	19.65	22.64	25.55
65–69	15.54	18.32	21.12
70–74	11.87	14.24	16.78
75–79	8.81	10.59	12.85
80–84	6.34	7.56	9.34
85+	3.54	4.25	5.05

*A type of model life table, full name: Coale and Demeny West level 26.

Table A2. Updated disability weights for respiratory disease models

Disease model	Health state	Previously applied disability weight ^a	Currently applied disability weight ^b	Description
Influenza	Acute episode ^c	0.261	0.051	Acute episode, moderate
	ARDS long-term	0.17	0.044	Motor plus cognitive impairments, mild
	Otitis media long-term	0.17 (age-dependent)	0.037	Hearing loss, moderate
	Sepsis long-term	0.28	0.217	Post-acute consequences (fatigue, insomnia, emotional lability)
Legionellosis	Acute legionellosis: mild	0.136	0.051	Acute episode, moderate
	Acute legionellosis: moderate	0.136	0.125	Acute episode, severe
	Acute legionellosis: severe	0.136	0.655	ICU admission
	Fatigue (long-term)	0.14	0.217	Post-acute consequences (fatigue, insomnia, emotional lability)
	Concentration & memory loss (long-term)	0.14	0.089	Traumatic brain injury: long-term consequences, minor, with or without treatment
	Muscle/joint pain, weakness (long-term)	0.06	0.094	Musculoskeletal problems in lower limbs, moderate
	PTSS (long-term)	0.13	0.119	Anxiety disorder, moderate
	Q fever	Acute Q fever: mild	0.261	0.007
	Acute Q fever: severe	2.61	0.125	Acute episode, severe
	Post-infectious fatigue syndrome	0.14	0.217	Post-acute consequences (fatigue, insomnia, emotional lability)
	Endocarditis	0.201	0.07	Heart failure, moderate
	Vascular infection	0.201	0.07	<i>Heart failure</i> , moderate
Tuberculosis	Active illness	0.29 (age-dependent)	0.308	Tuberculosis (without HIV infection)
Psittacosis	Nonspecific febrile illness	Pert (0.006, 0.051, 0.133)	0.051	Acute episode, moderate
	Pneumonia	Pert (0.088, 0.133, 0.190)	0.125	Acute episode, severe
	Invasive illness	Pert (0.579, 0.655, 0.727)	0.655	ICU admission

a Source: Bijkerk et al. [1, 2].

b Source: Haagsma et al. [3].

Duration of all acute influenza episodes was set to 2 weeks.

Table A3. Updated disability weights for sexually transmitted disease models

Disease model	Health state	Previously applied disability weight ^a	Currently applied disability weight ^b	Description
Chlamydia -infants	Ophthalmia neonatorum	0.18	0.125	Acute episode, severe
	Nasopharyngeal infection	0.28	0.125	Acute episode, severe
	Neonatal pneumonia	0.28	0.125	Acute episode, severe
Chlamydia – women	Acute illness	0.049	0.007	Acute episode, mild
	Pelvic inflammatory disease	0.169	0.123	Abdominopelvic problem, moderate
	Tubal infertility	0.18	0.007	Infertility, secondary
	Ectopic pregnancy	0.549	0.31	Abdominopelvic problem, severe
	Chronic pelvic pain syndrome	0.122	0.123	Abdominopelvic problem, moderate
	Tubo-ovarian abscess	0.549	0.31	Abdominopelvic problem, severe
	Acute illness	0.067	0.007	Acute episode, mild
Chlamydia – men	Reactive arthritis	0.197	0.344	Musculoskeletal problem, generalised, moderate
	Epididymitis	0.167	0.176	Epididymo-orchitis
	Reiter’s syndrome	0.377	0.518	Musculoskeletal problem, generalised, severe
Gonorrhoea – infants	Acute illness: uncomplicated	0	0.051	Acute, moderate
	Ophthalmia neonatorum	0.18	0.015	Conjunctivitis without corneal scar
	Low birth weight	0	0.11	Generic uncomplicated disease: anxiety about diagnosis
Gonorrhoea – women	Acute illness: complicated	0.33	0.125	Acute episode, severe
	Acute illness: uncomplicated	0.049	0.051	Acute episode, moderate
	Pelvic inflammatory disease	0.169	0.123	Abdominopelvic problem, moderate
	Tubal infertility	0.18	0.007	Infertility, secondary
	Ectopic pregnancy	0.549	0.31	Abdominopelvic problem, severe
	Chronic pelvic pain syndrome	0.122	0.123	Abdominopelvic problem, moderate
	Tubo-ovarian abscess	0.549	0.31	Abdominopelvic problem, severe
Gonorrhoea – men	Acute illness: complicated	0.35	0.125	Acute episode, severe
	Acute illness: uncomplicated	0.067	0.051	Acute episode, moderate
	Epididymitis	0.167	0.176	Epididymo-orchitis
Syphilis – infants	Acute illness	0.315	0.125	Acute episode, severe
Syphilis – adults	Acute illness	0.015	0.007	Acute episode, mild
	Secondary syphilis	0.048	0.125	Acute episode, severe
	Neurosyphilis	0.281	0.494	Motor plus cognitive impairment, severe
Hepatitis B	Symptomatic infection	0.170 to 0.212 (age-dependent)	0.051	Acute episode, moderate

Table A3. (continued) Updated disability weights for sexually transmitted disease models

Disease model	Health state	Previously applied disability weight ^a	Currently applied disability weight ^b	Description
	Chronic hepatitis	0.096	0.07	Generic uncomplicated disease: worry and daily medication
	Fulminant liver failure	0.809	0.515	Terminal phase, with medication
	Compensated cirrhosis	0.33	0.07	Generic uncomplicated disease: worry and daily medication
	Decompensated cirrhosis	0.809	0.163	Decompensated cirrhosis
	Hepatocellular carcinoma	0.809	0.265	Cancer, diagnosis and primary therapy
Hepatitis C	Symptomatic infection	0.170 to 0.212 (age-dependent)	0.051	Acute episode, moderate
	Chronic hepatitis	0.06	0.07	Generic uncomplicated disease: worry and daily medication
	Compensated cirrhosis	0.33	0.07	Generic uncomplicated disease: worry and daily medication
	Decompensated cirrhosis	0.809	0.163	Decompensated cirrhosis
	Hepatocellular carcinoma	0.809	0.265	Cancer, diagnosis and primary therapy
HIV	Persistent HIV infection	Pert (0.089, 0.108, 0.132)	0.108	HIV/AIDS cases, receiving ARV treatment
	AIDS early symptomatic	Pert (0.299, 0.351, 0.394)	0.351	HIV cases, symptomatic, pre-AIDS
	AIDS terminal phase	Pert (0.518, 0.574, 0.635)	0.574	AIDS cases, not receiving ARV
	Permanent ARV treatment	Pert (0.089, 0.108, 0.132)	0.108	HIV/AIDS cases, receiving ARV treatment

a Source: Bijkerk et al. [1, 2].

b Source: Haagsma et al. [3].

Table A4. Updated disability weights for vaccine-preventable disease models

Disease model	Health state	Previously applied disability weight ^a	Currently applied disability weight ^b	Description
Measles	Acute episode	0.152	0.071	Syndromic weight acute episode: 73% moderate (0.051), 27% severe (0.125)
	SSPE	0.93	Pert (0.088, 0.276, 0.543)	SSPE, phase 1-3
	Encephalitis long-term	0.334–0.389	0.185	Motor plus cognitive impairments, moderate
	Post-inf enceph long-term	0.334–0.390	0.185	Motor plus cognitive impairments, moderate
	Otitis media long-term	0.168–0.175	0.037	Hearing loss, moderate
Diphtheria	Acute illness: polyneuropathy/ palsy	0.078	0.057	Syndromic weight acute episode: 92% moderate (0.051), 8% severe (0.125)
	Acute illness: myocarditis	0.323	0.057	
	Acute illness: uncomplicated	0.231	0.057	
	Permanent arrhythmias	0.171	0.295	Cardiac conduction disorders & dysrhythmias
Invasive <i>H. influenzae</i>	Acute episode	0.35	0.655	ICU admission
	Permanent disability due to meningitis	0.242	0.41	Encephalopathy, moderate
Invasive meningococcal disease	Acute episode	0.152	0.655	ICU admission
	Hearing loss	0.229	0.037	Hearing loss, moderate
	Seizures	0.100	0.488	Epilepsy, >= once-a-month seizures
	Motor disturbance	0.381	0.053	Motor impairment, moderate
	Visual deficit	0.108	0.034	Distance vision, moderate impairment
	Mental retardation	0.459	0.123	Intellectual disability, moderate
	Amputation	0.220	0.041	Amputation of one lower limb
	Skin scarring	0.001	0.067	Disfigurement level 2
Invasive pneumococcal disease	Acute episode	0.320	0.655	ICU admission
	Hearing loss	0.233	0.037	Hearing loss, moderate
Pertussis	Acute episode	0.137	Age 0: 0.072 Age >0: 0.055	Syndromic weight acute episode Age 0: 72% moderate (0.051), 28% severe (0.125) Age >0: 94% moderate, 6% severe
	Acute episode	0.130	0.098	Syndromic weight acute episode: 36% moderate, 64% severe
Mumps	Acute episode	0.130	0.098	Syndromic weight acute episode: 36% moderate, 64% severe
	Hearing loss	0.233	0.037	Hearing loss, moderate
Tetanus	Acute infection: cephalic tetanus	0.78	0.053	Motor impairment, moderate
	Acute infection: localized	0.108	0.011	Motor impairment, mild

Table A4. (continued) Updated disability weights for vaccine-preventable disease models

Disease model	Health state	Previously applied disability weight ^a	Currently applied disability weight ^b	Description
	Acute infection: generalized	0.6 (age-dependent)	0.421	Motor impairment, severe
Rubella – congenital	Hearing loss	0.333	0.037	Hearing loss, moderate
	Congenital heart defects	0.323	0.07	Heart failure, moderate
	Microcephaly	0.484	0.123	Intellectual disability, moderate
	Cataracts	0.17	0.034	Distance vision impairment, moderate
	Mental retardation	0.459	0.123	Intellectual disability, moderate
	Retinopathy	0.552	0.034	Distance vision impairment, moderate
	Insulin-dependent diabetes	0.015	0.07	Generic uncomplicated disease: worry and daily medication
	Thyroid gland dysfunction	0.35	0.07	Generic uncomplicated disease: worry and daily medication
Rubella – non-congenital	Acute episode	0.152	0.172	Syndromic weight acute episode: 50% arthritis (0.344), 0.03% thrombocytopenic purpura (0.167), 0.015% encephalitis (0.41), remaining mild (0.007)
Rabies	Acute: furious	0.638	0.655	ICU admission
	Acute: paralytic	0.725	0.655	ICU admission
Poliomyelitis	Acute episode: paralytic	0.28	0.125	Acute episode, severe
	Acute episode: non-paralytic	0.047	0.051	Acute episode, moderate
	Acute episode: uncomplicated	0	0.007	Acute episode, mild
	Post-polio syndrome	0.047	0.344	Musculoskeletal problem, generalised, moderate
	Permanent disability due to paralytic polio	0.369	0.298	Spinal cord lesion below neck (treated)

a Source: Bijkerk et al. [1, 2].

b Source: Haagsma et al. [3].

Table A5. Updated disability weights and durations for foodborne disease models

Disease model	Health state	Previously applied disability weight	Duration (years)	Currently applied disability weight ^b	Description of used disability weight	Duration (years)	Source (duration)
Campylobacteriosis	GE: mild ^c	0	-	0.073	Diarrhoea, mild	0.01	[4, 5]
	GE: moderate ^c	0.015	1	0.149	Diarrhoea, moderate	0.03	[4, 5]
	GE: severe ^c	0.041	1	0.239	Diarrhoea, severe	0.04	[4, 5]
	GBS: Clinical phase, mild	0.09	1	0.012	Derived from motor impairment, mild & moderate ^d	1.00	[6]
	GBS: Clinical phase, severe	0.28	1	0.229	Derived from ICU admission. motor impairment, moderate & severe ^e	1.00	[6]
	GBS: residual symptoms	0.16	41	0.110	Derived from motor impairment, mild, moderate & severe ^f	41.00	[6]
	ReA: mild ^c	0.023	1	0.034	Derived from musculoskeletal problems, upper limbs, mild & musculoskeletal problems, lower limbs, mild ^g	0.61	[4, 5]
	ReA: moderate ^c	0.115	1	0.116	Derived from musculoskeletal problems, upper limbs, moderate & musculoskeletal problems, lower limbs, moderate ^g	0.61	[4, 5]
	ReA: severe ^c	0.186	1	0.344	Musculoskeletal problems, generalized, moderate ^h	0.61	[4, 5]
	Irritable bowel syndrome	0.042	5	0.062	Irritable bowel syndrome	5.00	[6]
Inflammatory bowel disease	0.13	Rem. LE	0.221	Crohn's disease or ulcerative colitis	Rem. LE	[6]	
STEC O157 infection	GE: mild ^c	0	-	0.073	Diarrhoea, mild	0.01	[7]
	GE: moderate ^c	0.015	1	0.149	Diarrhoea, moderate	0.02	[7]
	GE: severe ^c	0.041	1	0.239	Diarrhoea, severe	0.02	[7]
	EDRD	0.154	49	0.279	Derived from generic uncomplicated disease: worry and daily medication and ESRD, on dialysis	49.00	[6]
	HUS	0.123	1	0.258	Derived from ICU admission & acute episode, severe ^k	0.06	[7]
Salmonellosis	GE: mild ^c	0	-	0.073	Diarrhoea, mild	0.02	[5]
	GE: moderate ^c	0.015	1	0.149	Diarrhoea, moderate	0.03	[5]
	GE: severe ^c	0.041	1	0.239	Diarrhoea, severe	0.04	[5]

Table A5. (continued) Updated disability weights and durations for foodborne disease models

Disease model	Health state	Previously applied disability weight	Duration (years)	Currently applied disability weight ^b	Description of used disability weight	Duration (years)	Source (duration)
	ReA: mild ^c	0.023	1	0.034	Derived from musculoskeletal problems, upper limbs, mild & musculoskeletal problems, lower limbs, mild ^h	0.61	[4, 5]
	ReA: moderate ^c	0.115	1	0.116	Derived from musculoskeletal problems, upper limbs, moderate & musculoskeletal problems, lower limbs, moderate ^h	0.61	[4, 5]
	ReA: severe ^c	0.186	1	0.344	Musculoskeletal problems, generalised, moderate ⁱ	0.61	[4, 5]
	Irritable bowel syndrome	0.042	5	0.062	Irritable bowel syndrome	5.00	[6]
	Inflammatory bowel disease	0.13	Rem. LE	0.221	Crohn's disease or ulcerative colitis	Rem. LE	[6]
Norovirus infection	GE: mild ^c	0	-	0.073	Diarrhoea, mild	0.01	[5]
	GE: moderate ^c	0.015	1	0.149	Diarrhoea, moderate	0.02	[5]
	GE: severe ^c	0.041	1	0.239	Diarrhoea, severe	0.02	[5]
Rotavirus infection	GE: mild ^c	0	-	0.073	Diarrhoea, mild	0.01	[5]
	GE: moderate ^c	0.015	1	0.149	Diarrhoea, moderate	0.02	[5]
	GE: severe ^c	0.041	1	0.239	Diarrhoea, severe	0.02	[5]
Cryptosporidiosis	GE: mild ^c	0	-	0.073	Diarrhoea, mild	0.01	[8]
	GE: moderate ^c	0.015	1	0.149	Diarrhoea, moderate	0.02	[8]
	GE: severe ^c	0.041	1	0.239	Diarrhoea, severe	0.05	[8]
Giardiasis	GE: mild ^c	0	-	0.073	Diarrhoea, mild	0.03	[8]
	GE: moderate ^c	0.015	1	0.149	Diarrhoea, moderate	0.03	[8]
	GE: severe ^c	0.041	1	0.239	Diarrhoea, severe	0.08	[8]
<i>B. cereus</i> toxin	GE: mild ^c	0	-	0.073	Diarrhoea, mild	0.01	[9]
	GE: moderate ^c	0.015	1	0.149	Diarrhoea, moderate	0.01	[9]
	GE: severe ^c	0.041	1	0.239	Diarrhoea, severe	0.04	[9]
<i>C. perfringens</i> toxin	GE: mild ^c	0	-	0.073	Diarrhoea, mild	0.01	[9]
	GE: moderate ^c	0.015	1	0.149	Diarrhoea, moderate	0.01	[9]
	GE: severe ^c	0.041	1	0.239	Diarrhoea, severe	0.04	[9]
<i>S. aureus</i> toxin	GE: mild ^c	0	-	0.073	Diarrhoea, mild	0.01	[9]
	GE: moderate ^c (i.e. visiting a GP)	0.015	1	0.149	Diarrhoea, moderate	0.01	[9]
	GE: severe ^c	0.041	1	0.239	Diarrhoea, severe	0.03	[9]

Table A5. (continued) Updated disability weights and durations for foodborne disease models

Disease model	Health state	Previously applied disability weight	Duration (years)	Currently applied disability weight ^b	Description of used disability weight	Duration (years)	Source (duration)
<i>Listeria monocytogenes</i> – acquired	Acquired listeriosis	0.041	1	0.231	Derived from ICU admission & acute episode, severe ^l	0.06	[10]
	Permanent disability due to meningitis	0.25	13	0.266	From lowest to highest motor and cognitive difficulties ^c	13.00	[6]
<i>Listeria monocytogenes</i> – perinatal	Symptomatic infection/meningitis	0.31	1	0.302	Derived from ICU admission & acute episode, severe ^l	0.04	[11]
	Permanent disability due to meningitis	0.25	Rem. LE	0.266	From lowest to highest motor and cognitive difficulties ^d	13.00	[6]
Hepatitis A	Hepatitis: mild ^c	0.011	1	0.007	acute episode, mild	0.04	[9]
	Hepatitis: moderate ^c	0.058	1	0.051	Acute episode, moderate	0.08	[9]
	Hepatitis: severe ^c	0.353	0.3	0.125	Acute episode, severe	0.08	[9]
Hepatitis E	Hepatitis: mild ^c	0.011	1	0.007	Acute episode, mild	0.08	[9]
	Hepatitis: moderate ^c	0.058	1	0.051	Acute episode, moderate	0.08	[9]
	Hepatitis: severe ^c	0.353	0.3	0.125	Acute episode, severe	0.16	[9]
Toxoplasmosis – acquired	Chorioretinitis	0.08	Rem. LE	0.015	Conjunctivitis without corneal scar ^d	Rem. LE	[6]
Toxoplasmosis – congenital	Chorioretinitis	0.08	Rem. LE	0.015	Conjunctivitis without corneal scar ^d	Rem. LE	[6]
	Post-1 year chorioretinitis	0.08	Rem. LE	0.015	Conjunctivitis without corneal scar ^d	Rem. LE	[6]
	Intracranial calcification	0.01	Rem. LE	0.088	Derived from intellectual disability, mild & moderate ^d	Rem. LE	[6]
	Hydrocephalus	0.36	Rem. LE	0.232	Derived from motor plus cognitive impairments, from mild to severe ^d	Rem. LE	[6]
	CNS abnormalities	0.36	Rem. LE	0.097	Derived from intellectual disability, mild & severe ⁿ	Rem. LE	[6]
Shigellosis	Acute illness: mild	0.105	0.018	0.149	Diarrhoea, moderate	0.018	[2]
	Acute illness: severe	0.105	0.018	0.239	Diarrhoea, severe	0.018	[2]

Table A5. (continued) Updated disability weights and durations for foodborne disease models

Disease model	Health state	Previously applied disability weight	Duration (years)	Currently applied disability weight ^b	Description of used disability weight	Duration (years)	Source (duration)
	Irritable bowel syndrome	0.042	5	0.062	Irritable bowel syndrome	5	[2]
	ReA	0.4505	0.131	0.116	Derived from musculoskeletal problems, upper limbs, moderate & musculoskeletal problems, lower limbs, moderate	0.131	[2]
	HUS	3.21	0.038	0.258	Derived from ICU admission, acute episode, severe	0.038	[2]
	ESRD	0.154	Rem. LE	0.279	Derived from generic uncomplicated disease: worry and daily medication and ESRD, on dialysis	Rem. LE	[2]
Variant Creutzfeldt-Jakob Disease	Symptomatic infection	0.613	1.167	0.494	Motor plus cognitive impairments, severe	1.167	[2]

Abbreviations: CNS = central nervous system; ESRD = end-stage renal disease; GBS = Guillain-Barré Syndrome; GE = gastroenteritis; GP = general practitioner; HUS = hemolytic uremic syndrome; ICU = intensive care unit; ReA = Reactive arthritis; Rem.LE = remaining life expectancy

- a. For details see Havelaar et al. [6].
- b. Source: Haagsma et al. [3].
- c. Mild= not visiting a GP; moderate= visiting a GP; severe= hospitalised.
- d. Same description as in Colzani et al. [12] to be used in the BCoDE model.
- e. Assuming that in the first 3 months 50% have an F-score of 1 (motor impairment, mild) and 50% an F-score of 2 (motor impairment, moderate). After 3 months 50% have an F-score of 0 (= recovered) and the remaining cases have an F-score of 1 [4, 13].
- f. Assuming that 25% require ventilation (= ICU admission) during 0.25 years and severe motor impairment for the remaining days during the clinical phase. Further assuming that 75% have severe motor impairment for 0.25 years and moderate motor impairment for the remaining days during the clinical phase [4, 14].
- g. 15% to 20% of all GBS cases are left with severe neurological deficit, assuming 100% motor impairment, severe. And assuming for the remaining cases that 50% have an F1-score (motor impairment, mild) and 50% have an F2-score (motor impairment, moderate) [4].
- h. Assuming 50% and 50%.
- i. Same as Colzani et al. [12], but only for the severe ReA cases.
- j. Average length on dialysis before transplantation is age-dependent and is, according to Havelaar et al. [7], for 0–15 years; 16–44 years; 45–64 years and 65 years and older ESRD patients on average 2.1 years; 3.4 years; 9.9 years and remaining LE, respectively; graft survival is according to the same authors 19.8 years. But taking into account that some ESRD patients die during dialysis and/or due to transplantation, we assume for simplification that it is 50% ESRD on dialysis and 50% generic uncomplicated disease: worry and daily medication.
- k. According to McPherson et al. [15], all HUS cases were admitted at ICU. Jenssen et al. [16] finds severe complications, most of them probably requiring intensive care as well. Information on length of ICU stay is scarce. Hospital duration is, according to Ruzante et al. [10], 13.3 days on average; Jenssen et al. [16] report that HUS patients were sick for 5 to 6 days before hospital admission. For simplification, we therefore assume 25% ICU and 75% acute episode, severe.
- l. According to Ruzante et al. [10], average duration in hospital is 23 days, and according to Haagsma et al. [9], patients stay on average 5 days at ICU; therefore assuming 1/5 ICU and 4/5 infectious diseases, acute episode, severe.
- m. According to Bos et al. [11], average duration in hospital is 15 days, and according to Haagsma et al. [9], patients stay on average 5 days at ICU; therefore assuming 1/3 ICU and 2/3 infectious diseases, acute episode, severe.
- n. Average between mild and severe; same description as Colzani et al. [12] but with severe as the worst health state rather than moderate, as chosen by Colzani et al. [12]. This is more in line with Torgerson et al. [17] and Havelaar et al. [6], who considered CNS abnormalities to be more severe than intracranial calcification.

References:

1. Bijkerk P, De Gier B, Nijsten DRE, Duijster JW, Soetes LC, Hahné SJM. State of infectious diseases in the Netherlands, 2015. Bilthoven: National Institute for Public Health and the Environment (RIVM); 2016;Report 2016-0069.
2. Bijkerk P, van Lier A, McDonald S, Kardamanidis K, Fanoy EB, Wallinga J, et al. State of infectious diseases in the Netherlands, 2013. RIVM; 2014.
3. Haagsma JA, Maertens de Noordhout C, Polinder S, Vos T, Havelaar AH, Cassini A, et al. Assessing disability weights based on the responses of 30,660 people from four European countries. *Popul Health Metr.* 2015;13:10.
4. Mangen MJJ, Havelaar AH, Bernsen RA, Van Koningsveld R, De Wit GA. The costs of human campylobacter infections and sequelae in the Netherlands: a DALY and cost-of-illness approach. *Food Economics – Acta Agriculturae Scandinavica C.* 2005;2:35–51.
5. Kemmeren JM, Mangen MJJ, van Duynhoven YTHP, Havelaar AH. Priority setting of foodborne pathogens – disease burden and costs of selected enteric pathogens. Bilthoven: National Institute of Public Health and the Environment (RIVM); 2006;Report 330080001/2006.
6. Havelaar AH, Haagsma JA, Mangen MJ, Kemmeren JM, Verhoef LP, Vijgen SM, et al. Disease burden of foodborne pathogens in the Netherlands, 2009. *Int J Food Microbiol.* 2012;156(3):231–8.
7. Havelaar AH, Van Duynhoven YT, Nauta MJ, Bouwknegt M, Heuvelink AE, De Wit GA, et al. Disease burden in The Netherlands due to infections with Shiga toxin-producing *Escherichia coli* O157. *Epidemiol Infect.* 2004;132(3):467–84.
8. Vijgen SM, Mangen MJ, Kortbeek LM, van Duynhoven YTHP, Havelaar AH. Disease burden and related costs of cryptosporidiosis and giardiasis in the Netherlands. Bilthoven: National Institute of Public Health and the Environment (RIVM); 2007;Report 330081001.
9. Haagsma J, Van den Zanden BP, Tariq L, Van Pelt W, Van Duynhoven YTPH, Havelaar AH. Disease burden and costs of selected foodborne pathogens in the Netherlands, 2006. Bilthoven: National Institute of Public Health and the Environment (RIVM); 2009;Report 330331001/2009.
10. Ruzante JM, Majowicz SE, Fazil A, Davidson VJ. Hospitalization and deaths for select enteric illnesses and associated sequelae in Canada, 2001–2004. *Epidemiol Infect.* 2011;139(6):937–45.
11. Bos JM, Rumke HC, Welte R, Postma MJ, Jager JC. Health economics of a hexavalent meningococcal outer-membrane vesicle vaccine in children: potential impact of introduction in the Dutch vaccination program. *Vaccine.* 2001;20(1–2):202–7.
12. Colzani E, Cassini A, Lewandowski D, Mangen MJ, Plass D, McDonald SA, et al. A software tool for estimation of burden of infectious diseases in Europe using incidence-based disability adjusted life years. *PLoS One.* 2017;12(1):e0170662.
13. van Leeuwen N, Lingsma HF, Vanrolleghem AM, Sturkenboom MC, van Doorn PA, Steyerberg EW, et al. Hospital admissions, transfers and costs of Guillain-Barré syndrome. *PLoS One.* 2016;11(2):e0143837.
14. van der Maas NA, Kramer MA, Jacobs BC, van Soest EM, Dieleman JP, Kemmeren JM, et al. Guillain-Barré syndrome: background incidence rates in The Netherlands. *J Peripher Nerv Syst.* 2011;16(3):243–9.
15. McPherson M, Kirk MD, Raupach J, Combs B, Butler JR. Economic costs of Shiga toxin-producing *Escherichia coli* infection in Australia. *Foodborne Pathog Dis.* 2011;8(1):55–62.
16. Jenssen GR, Vold L, Hovland E, Bangstad HJ, Nygard K, Bjerre A. Clinical features, therapeutic interventions and long-term aspects of hemolytic-uremic syndrome in Norwegian children: a nationwide retrospective study from 1999–2008. *BMC Infect Dis.* 2016;16:285.
17. Torgerson PR, Devleeschauwer B, Praet N, Speybroeck N, Willingham AL, Kasuga F, et al. World Health Organization Estimates of the Global and Regional Disease Burden of 11 Foodborne Parasitic Diseases, 2010: A Data Synthesis. *PLoS Med.* 2015;12(12):e1001920.



.....
B. de Gier, D.R.E. Nijsten, J.W. Duijster, S.J.M. Hahné
.....

RIVM Report 2017-0029

Published by

**National Institute for Public Health
and the Environment**

P.O. Box 1 | 3720 BA Bilthoven
The Netherlands

www.rivm.nl/en

Juli 2017

Committed to *health and sustainability*