

Supplemental Table 1. All age and age-standardized rates of incidence, deaths and DALYs per 100,000 people for valvular heart disease in 21 GBD regions between 1990 and 2017.

Country	Rheumatic heart disease				Non-rheumatic valvular heart disease			
	All age		Age-Standardized		All age		Age-Standardized	
	1990	2017	1990	2017	1990	2017	1990	2017
Global								
Incidence	18.79 (19.42-18.18)	17.16 (17.73-16.61)	17.62 (18.19-17.07)	18.07 (18.67-17.48)	276.84 (287.76-266.28)	401.69 (418.85-385.27)	384.35 (400.24-368.89)	391.49 (408.77-374.98)
Deaths	6.23 (6.84-5.87)	3.74 (3.97-3.48)	8.01 (8.82- 7.59)	3.68 (3.90- 3.43)	1.27 (1.42- 1.18)	1.90 (1.97-1.59)	2.03 (2.31- 1.90)	1.97 (2.05 -1.64)
DALYs	229.35 (249.72-213.81)	122.94(135.24-112.26)	255.43 (278.80-238.84)	118.72 (130.66-108.52)	27.58 (31.08-25.04)	33.10 (36.31-29.96)	37.47 (41.92-34.06)	32.74 (35.98-29.53)
Andean Latin America								
Incidence	25.35 (26.15-24.54)	21.74 (22.43-21.08)	20.52 (21.19-19.86)	20.92 (21.59-20.29)	106.46 (110.03-102.94)	188.17 (195.33-181.40)	190.61 (197.13-184.22)	212.78 (221.03-204.94)
Deaths	2.24 (2.52-2.04)	1.36 (1.48-1.24)	3.60 (4.02-3.28)	1.52 (1.66-1.39)	0.49 (0.54-0.41)	0.62 (0.69- 0.57)	0.85 (0.94-0.72)	0.70 (0.78- 0.64)
DALYs	114.50 (133.29-100.15)	69.27 (84.82-56.96)	136.09 (156.63-c119.70)	71.71 (87.25-59.26)	16.09 (18.17-13.65)	17.29 (19.39-15.41)	23.36 (26.42-19.79)	18.79 (21.06-16.74)
Australasia								
Incidence	3.06 (3.23-2.89)	3.09 (3.37-2.83)	2.74 (2.90-2.58)	1.91 (2.09-1.74)	354.87 (373.93-336.44)	589.87 (627.35-553.49)	301.67 (317.69-286.42)	343.21 (363.86-323.91)

Deaths	2.94 (3.04-2.84)	2.31 (2.52-2.13)	2.55 (2.64-2.47)	1.27 (1.38-1.16)	4.00 (4.43-3.40)	6.84 (7.49-5.56)	3.47 (3.91-3.01)	3.35 (3.69-2.78)
DALYs	63.36 (65.60-61.31)	36.66 (39.97-33.64)	55.70 (57.66- 53.96)	24.87 (27.01- 22.88)	65.40 (70.06-53.36)	79.17 (88.38-69.06)	55.29 (59.28- 45.71)	44.46 (50.00- 38.93)
Caribbean								
Incidence	22.30 (23.01- 21.63)	19.44 (20.05-18.82)	19.92 (20.52- 19.34)	20.79 (21.43- 20.14)	170.12 (175.56- 164.60)	261.30 (270.75-252.00)	225.19 (232.44- 217.70)	237.98 (246.61- 229.43)
Deaths	5.42 (6.49- 4.71)	3.67 (4.29-3.18)	6.47 (7.65-5.66)	3.41 (4.00-2.96)	1.50 (1.64-1.32)	2.16 (2.41-1.95)	2.07 (2.25-1.79)	1.96 (2.19-1.78)
DALYs	256.71 (309.41- 222.60)	155.46 (185.46- 132.50)	272.55 (326.11- 236.78)	149.35 (178.71- 127.40)	37.87 (41.52- 33.81)	48.85 (55.04- 44.18)	47.13 (51.68- 42.20)	44.83 (50.54-40.57)
Central Asia								
Incidence	22.33 (22.97- 21.71)	19.50 (20.12- 18.93)	19.97 (20.51- 19.43)	19.41 (20.01-18.86)	204.99 (215.55-195.34)	272.42 (286.62- 258.31)	303.23 (319.06- 288.60)	343.30 (362.61- 324.67)
Deaths	5.52 (5.67-5.36)	3.79 (4.06-3.55)	7.02 (7.22- 6.80)	4.51 (4.81-4.24)	0.33 (0.38-0.29)	0.62 (0.67-0.45)	0.50 (0.59-0.43)	0.87 (0.95-0.62)
DALYs	249.84 (263.03- 238.45)	156.83 (173.91- 142.61)	289.53 (303.64- 277.07)	160.99 (177.61- 147.04)	10.50 (12.15-9.08)	17.32 (19.48- 13.94)	14.65 (17.15-12.50)	21.23 (24.22- 17.03)
Central Europe								
Incidence	7.32 (7.58-7.09)	4.96 (5.37-4.59)	6.36 (6.56-6.15)	3.38 (3.65-3.12)	767.03 (809.83- 730.25)	1396.24 (1494.20- 1314.04)	635.09 (669.53- 604.55)	754.51 (804.05- 711.60)
Deaths	6.65 (6.80-6.52)	2.62 (2.77-2.51)	5.61 (5.72-5.49)	1.42 (1.50-1.37)	2.39 (2.79-2.24)	5.13 (5.43-3.77)	2.07 (2.45-1.96)	2.63 (2.79-1.95)
DALYs	189.14 (193.57- 185.09)	53.66 (56.56- 51.32)	160.72 (164.45- 157.28)	33.11 (34.85-31.67)	58.38 (65.26- 53.00)	94.41 (104.85- 76.05)	49.10 (55.18- 44.68)	51.64 (56.96-41.83)
Central Latin								

America								
Incidence	11.44 (11.83-11.07)	9.40 (9.72-9.09)	9.89 (10.20-9.59)	9.35 (9.66-9.05)	110.45 (113.79-106.96)	205.64 (213.20-197.93)	205.91 (212.33-199.37)	225.69 (234.05-217.02)
Deaths	1.63 (1.68-1.59)	0.73 (0.77-0.69)	2.64 (2.73-2.58)	0.79 (0.84-0.76)	0.51 (0.56-0.45)	1.00 (1.08-0.75)	0.95 (1.06-0.85)	1.12 (1.21-0.83)
DALYs	74.48 (80.44-69.74)	34.35 (40.70-29.60)	95.05 (101.80-89.72)	34.80 (40.97-30.12)	15.56 (17.06-13.90)	25.49 (27.72-20.22)	24.92 (27.61-22.31)	27.30 (29.74-21.57)
Central Sub-Saharan Africa								
Incidence	40.06 (41.40-38.76)	38.95 (40.25-37.74)	30.01 (31.02-29.03)	29.40 (30.37-28.48)	98.38 (101.47-95.38)	100.53 (103.76-97.18)	244.55 (251.99-237.04)	247.26 (255.36-238.85)
Deaths	5.50 (6.75-4.28)	2.58 (3.04-2.10)	11.05 (13.53-8.77)	5.66 (6.66-4.62)	0.69 (0.84-0.56)	0.60 (0.71-0.50)	2.05 (2.49-1.72)	1.80 (2.20-1.48)
DALYs	268.20 (321.41-212.17)	138.47 (163.74-113.70)	371.60 (442.02-295.15)	198.24 (231.32-164.70)	20.39 (25.87-15.73)	16.88 (20.40-14.04)	44.14 (53.45-36.26)	37.62 (44.26-31.69)
East Asia								
Incidence	20.77 (21.71-19.92)	12.38 (12.90-11.89)	19.94 (20.80-19.11)	17.37 (18.14-16.63)	114.38 (118.13-110.65)	244.46 (253.43-235.99)	160.79 (165.97-155.52)	182.42 (188.79-176.29)
Deaths	10.05 (11.29-9.47)	4.91 (5.19-4.69)	15.16 (17.25-14.26)	4.01 (4.24-3.83)	0.55 (0.69-0.48)	0.82 (1.05-0.77)	1.02 (1.28-0.90)	0.70 (0.91-0.66)
DALYs	327.75 (355.99-307.76)	128.54 (143.79-116.34)	389.10 (427.15-365.70)	102.90 (116.17-92.22)	13.69 (17.06-11.67)	16.65 (20.61-15.16)	19.12 (23.53-16.84)	13.17 (16.32-11.98)
Eastern Europe								
Incidence	8.26 (9.11-7.54)	4.42 (4.96-3.96)	6.91 (7.58-6.35)	3.30 (3.67-2.96)	414.68 (434.52-	624.43 (661.89-	336.82 (352.15-	384.45 (406.22-

					396.37)	589.14)	322.16)	363.47)
Deaths	6.34 (6.67-5.92)	2.44 (2.56-2.35)	5.10 (5.36-4.76)	1.55 (1.63-1.49)	0.47 (0.59-0.43)	1.09 (1.16-0.78)	0.40 (0.51-0.37)	0.68 (0.72-0.49)
DALYs	199.34 (209.73-186.28)	64.55 (67.82-61.97)	164.31 (172.87-153.41)	44.10 (46.45-42.19)	15.69 (19.12-13.33)	30.17 (34.55-23.87)	13.22 (16.07-11.26)	19.99 (22.65-15.85)
Eastern Sub-Saharan Africa								
Incidence	43.94 (45.50-42.47)	44.06 (45.63-42.57)	32.13 (33.27-31.09)	32.69 (33.80-31.65)	88.76 (91.50-86.19)	94.39 (97.32-91.64)	228.31 (235.17-221.48)	236.87 (244.61-229.14)
Deaths	3.48 (4.22-2.83)	1.22 (1.41-1.03)	6.98 (8.49-5.94)	2.71 (3.14-2.27)	0.70 (0.88-0.56)	0.49 (0.60-0.41)	2.02 (2.50-1.68)	1.42 (1.80-1.15)
DALYs	198.24 (240.86-157.79)	95.00 (116.16-77.24)	254.65 (302.73-212.87)	122.05 (146.01-100.95)	21.74 (29.25-16.50)	14.40 (17.05-12.44)	45.27 (56.89-36.34)	30.79 (37.31-26.00)
High-income Asia Pacific								
Incidence	2.67 (2.98-2.37)	3.47 (3.88-3.07)	2.58 (2.87-2.31)	1.30 (1.44-1.16)	746.36 (784.99-710.72)	1521.83 (1617.57-1434.45)	640.17 (674.24-610.23)	674.59 (711.28-640.98)
Deaths	2.81 (2.89-2.76)	3.01 (3.20-2.88)	2.71 (2.78-2.66)	0.96 (1.02-0.92)	1.69 (1.98-1.52)	5.79 (6.20-3.89)	1.65 (1.98-1.52)	1.73 (1.84-1.22)
DALYs	55.92 (57.45-54.88)	31.01 (32.74-29.74)	50.25 (51.58-49.27)	14.02 (14.78-13.42)	35.31 (40.59-30.79)	68.54 (79.97-55.79)	31.66 (36.38-27.81)	25.25 (29.39-21.35)
High-income North America								
Incidence	4.05 (4.49-3.63)	3.96 (4.28-3.69)	3.14 (3.47-2.82)	2.24 (2.42-2.09)	1096.85 (1154.24-1044.90)	1603.36 (1671.59-1536.14)	846.30 (888.22-808.22)	954.58 (994.06-916.54)
Deaths	3.82 (3.89-3.76)	3.30 (3.42-3.17)	2.92 (2.98-2.88)	1.82 (1.89-1.75)	4.27 (4.73-3.67)	6.74 (7.06-5.31)	3.15 (3.48-2.71)	3.37 (3.55-2.75)

DALYs	75.54 (77.24-74.25)	51.82 (53.96-49.60)	62.31 (63.72-61.24)	34.19 (35.74-32.68)	74.67 (83.32-64.70)	91.93 (104.34-80.61)	57.18 (63.69-49.36)	52.92 (60.05-46.77)
North Africa and Middle East								
Incidence	18.37 (18.98-17.73)	16.67 (17.20-16.13)	14.86 (15.34-14.36)	15.71 (16.20-15.20)	111.65 (115.58-107.93)	173.59 (180.03-167.45)	221.31 (229.46-213.60)	249.00 (258.80-239.59)
Deaths	2.97 (3.82-2.47)	1.19 (1.60-1.00)	4.38 (5.78-3.64)	1.59 (2.10-1.35)	0.94 (1.14-0.79)	1.05 (1.16-0.96)	2.02 (2.37-1.76)	1.63 (1.79-1.49)
DALYs	163.43 (197.79-135.21)	66.13 (82.36-54.77)	179.50 (221.61-151.29)	70.33 (87.84-58.90)	27.49 (34.26-22.37)	28.30 (31.99-25.33)	46.47 (56.48-38.80)	36.96 (41.61-33.22)
Oceania								
Incidence	36.39 (37.59-35.24)	34.44 (35.56-33.34)	28.20 (29.16-27.30)	28.78 (29.74-27.85)	117.82 (121.70-113.88)	138.48 (143.20-133.85)	267.10 (275.99-257.99)	277.77 (287.21-268.02)
Deaths	21.11 (25.61-16.61)	17.20 (20.95-13.67)	33.92 (40.64-27.19)	24.85 (29.55-20.08)	1.44 (1.81-1.18)	1.42 (1.80-1.15)	3.44 (4.19-2.98)	2.94 (3.71-2.54)
DALYs	1029.43 (1232.43-827.36)	838.74 (1016.91-675.30)	1249.98 (1504.52-993.26)	945.57 (1140.90-762.98)	54.14 (70.08-42.47)	53.74 (70.73-41.13)	86.49 (106.98-71.33)	76.12 (96.15-61.95)
South Asia								
Incidence	24.49 (25.54-23.51)	21.39 (22.29-20.46)	20.56 (21.44-19.73)	19.50 (20.31-18.69)	109.71 (113.03-106.61)	176.89 (182.51-171.62)	209.70 (215.94-203.47)	239.15 (246.88-231.66)
Deaths	8.17 (9.93-6.94)	6.72 (7.70-5.76)	13.62 (16.72-11.70)	9.29 (10.57-8.02)	0.52 (0.67-0.42)	0.82 (0.94-0.68)	1.21 (1.50-1.00)	1.32 (1.50-1.11)
DALYs	349.98 (413.34-	236.62 (267.79-	441.43 (526.94-	266.77 (302.06-	14.82 (19.55-	20.89 (23.91-	25.97 (32.99-	27.44 (31.29-

	299.89)	205.29)	378.20)	231.44)	11.68)	17.20)	21.06)	22.85)
Southeast Asia								
Incidence	14.22 (14.64-13.77)	11.66 (12.04-11.29)	12.71 (13.09-12.32)	12.12 (12.50-11.75)	120.78 (124.37-117.34)	216.06 (223.00-209.05)	216.91 (223.66-210.44)	245.81 (253.68-237.66)
Deaths	3.48 (4.18-3.21)	1.50 (1.60-1.42)	5.68 (7.08-5.18)	1.73 (1.83-1.63)	0.36 (0.42-0.33)	0.53 (0.62-0.48)	0.73 (0.83-0.66)	0.68 (0.78-0.62)
DALYs	158.44 (181.25-145.82)	73.04 (82.83-65.33)	186.80 (218.63-172.43)	72.71 (82.14-65.32)	11.36 (13.11-10.00)	14.86 (17.36-13.22)	18.13 (20.73-15.90)	16.73 (19.38-14.74)
Southern Latin America								
Incidence	16.70 (17.22-16.16)	15.04 (15.56-14.52)	16.30 (16.81-15.78)	16.60 (17.16-16.06)	452.89 (475.05-430.69)	705.09 (747.22-664.60)	485.04 (508.76-461.25)	563.58 (596.65-532.38)
Deaths	6.49 (6.76-6.24)	5.42 (5.97-4.95)	7.22 (7.51-6.94)	4.19 (4.60-3.83)	2.93 (3.21-2.48)	4.27 (4.88-3.57)	3.38 (3.71-2.86)	3.27 (3.74-2.75)
DALYs	166.74 (178.33-156.66)	109.80 (124.12-97.38)	173.44 (185.34-163.24)	93.94 (106.88-82.74)	57.99 (64.32-49.40)	70.40 (79.87-61.93)	62.30 (69.15-53.00)	56.25 (63.80-49.61)
Southern Sub-Saharan Africa								
Incidence	34.56 (35.95-33.33)	30.21 (31.35-29.09)	27.42 (28.50-26.43)	27.82 (28.86-26.79)	132.38 (136.64-128.42)	182.86 (188.94-176.96)	246.14 (254.24-238.42)	256.89 (265.83-247.96)
Deaths	3.44 (3.78-3.06)	2.55 (2.80-2.34)	5.14 (5.73-4.55)	3.32 (3.59-3.09)	0.90 (1.02-0.78)	0.98 (1.10-0.91)	1.70 (1.94-1.47)	1.53 (1.70-1.42)
DALYs	188.19 (210.17-167.37)	140.63 (165.82-121.02)	218.37 (242.81-194.22)	149.77 (174.37-130.39)	29.18 (32.16-25.16)	26.48 (30.86-24.26)	42.61 (47.59-36.81)	33.80 (38.39-31.01)
Tropical Latin America								
Incidence	25.42 (26.58-	19.81 (20.72-	21.38 (22.38-	21.78 (22.79-	137.73 (142.11-	256.88 (265.85-	224.25 (231.33-	242.24 (250.67-

	24.29)	18.96)	20.44)	20.83)	133.55)	247.92)	217.22)	233.68)
Deaths	1.75 (1.80-1.69)	1.25 (1.30-1.20)	2.38 (2.44-2.31)	1.18 (1.23-1.14)	0.99 (1.08-0.85)	1.86 (1.95-1.47)	1.69 (1.86-1.48)	1.82 (1.91-1.43)
DALYs	108.25 (123.49-95.92)	75.91 (93.03-62.80)	117.88 (133.73-105.05)	70.96 (86.91-58.73)	30.17 (32.15-25.64)	42.13 (44.96-35.67)	42.52 (45.42-36.36)	39.55 (42.28-33.37)
Western Europe								
Incidence	4.80 (5.01-4.60)	4.71 (5.06-4.38)	3.11 (3.25-2.99)	2.00 (2.16-1.85)	946.52 (993.20-901.90)	1533.63 (1639.70-1439.62)	617.99 (646.66-590.05)	728.17 (770.93-689.47)
Deaths	4.89 (4.99-4.82)	4.00 (4.35-3.81)	3.15 (3.21-3.10)	1.58 (1.71-1.50)	6.05 (6.98-5.40)	10.69 (11.37-8.28)	3.81 (4.41-3.43)	3.99 (4.25- 3.17)
DALYs	88.58 (90.20-87.02)	48.12 (51.57-45.86)	61.49 (62.54-60.36)	23.58 (25.02-22.53)	99.16 (112.01-87.90)	130.65 (144.36-111.79)	64.14 (72.33-56.92)	56.90 (62.48-49.78)
Western Sub-Saharan Africa								
Incidence	32.49 (33.53-31.47)	33.76 (34.86-32.68)	25.13 (25.89-24.37)	25.71 (26.51-24.92)	94.84 (97.80-91.99)	90.97 (93.80-88.17)	198.96 (205.28-192.76)	209.14 (216.15-202.04)
Deaths	3.47 (4.10-2.95)	1.38 (1.56-1.21)	6.45 (7.69-5.45)	3.08 (3.51-2.68)	0.44 (0.60-0.32)	0.39 (0.49-0.31)	0.88 (1.16-0.67)	0.86 (1.07-0.69)
DALYs	180.55 (211.86-151.01)	88.94 (106.93-73.14)	211.65 (245.57-180.74)	115.69 (135.63-97.77)	16.10 (22.27-11.51)	14.89 (18.94-11.51)	26.12 (34.92-19.54)	25.10 (31.18-19.99)

Supplemental Table 2 Annual change of ASIR for RHD and NRVHD among 195 countries and territories from 1990 to 2017.

Location	Sex	Annual change of ASIR (%)	
		RHD	NRVHD
Afghanistan	Both	-0.1165	0.2163
Albania	Both	-0.0978	0.5083
Algeria	Both	-0.0031	0.3280
American Samoa	Both	0.0388	0.1797
Andorra	Both	-0.9873	0.3559
Angola	Both	-0.0638	0.2580
Antigua and Barbuda	Both	-0.0282	0.2563
Argentina	Both	0.0097	0.5051
Armenia	Both	-0.0804	0.5460
Australia	Both	-1.1464	0.5146
Austria	Both	-2.0076	0.7361
Azerbaijan	Both	-0.0966	0.5195
Bahrain	Both	-2.1333	0.2598
Bangladesh	Both	-0.1702	0.4692
Barbados	Both	0.0303	0.1980
Belarus	Both	-3.2195	0.4506
Belgium	Both	0.2392	0.6166
Belize	Both	-0.0470	0.3269
Benin	Both	0.0161	0.2062
Bermuda	Both	-2.0748	0.1290
Bhutan	Both	-0.1529	0.5277
Bolivia	Both	0.0151	0.3612
Bosnia and Herzegovina	Both	0.1618	0.7727
Botswana	Both	-0.0020	0.3699

Brazil	Both	0.0703	0.2833
Brunei	Both	-1.6969	0.2452
Bulgaria	Both	-3.2298	0.3980
Burkina Faso	Both	0.0032	0.2662
Burundi	Both	0.0379	-0.0832
Cambodia	Both	-0.1615	0.4463
Cameroon	Both	0.1726	0.0494
Canada	Both	-1.3365	0.4609
Cape Verde	Both	-0.1165	0.3868
Central African Republic	Both	-0.0086	-0.0637
Chad	Both	-0.0375	0.1822
Chile	Both	-2.3576	0.7221
China	Both	-0.5248	0.4657
Colombia	Both	-1.1019	0.2407
Comoros	Both	0.0561	-0.0662
Congo	Both	-0.0725	0.1281
Costa Rica	Both	-0.0059	0.2523
Cote d'Ivoire	Both	-0.0635	0.1073
Croatia	Both	-2.1435	0.7453
Cuba	Both	0.0677	0.1803
Cyprus	Both	-2.5529	0.3904
Czech Republic	Both	-2.3953	0.8493
Democratic Republic of the Congo	Both	-0.0766	-0.0564
Denmark	Both	-2.4233	0.6568
Djibouti	Both	0.2052	0.0127
Dominica	Both	-0.0557	0.3335

Dominican Republic	Both	0.0213	0.3785
Ecuador	Both	0.0630	0.4459
Egypt	Both	0.0813	0.4836
El Salvador	Both	0.0716	0.4480
Equatorial Guinea	Both	-0.3313	1.0226
Eritrea	Both	0.0115	0.1166
Estonia	Both	-2.4205	0.4683
Ethiopia	Both	0.0114	0.2387
Federated States of Micronesia	Both	0.0680	0.2002
Fiji	Both	-0.0757	0.2027
Finland	Both	-2.4176	0.5180
France	Both	-1.1944	0.4638
Gabon	Both	-0.0074	0.0799
Georgia	Both	0.1230	0.3948
Germany	Both	-1.2038	0.7854
Ghana	Both	-0.1009	0.3207
Greece	Both	-1.8487	0.5476
Greenland	Both	-2.0773	0.3529
Grenada	Both	-0.0508	0.3716
Guam	Both	0.0916	0.1474
Guatemala	Both	0.0225	0.3519
Guinea	Both	0.1465	0.0819
Guinea-Bissau	Both	0.1475	0.1149
Guyana	Both	-0.0349	0.2306
Haiti	Both	-0.0352	0.1102
Honduras	Both	0.0068	0.3698

Hungary	Both	-3.0670	0.2149
Iceland	Both	-0.2234	0.7370
India	Both	-0.2367	0.5272
Indonesia	Both	-0.4633	0.4580
Iran	Both	-0.0773	0.5198
Iraq	Both	-0.0228	0.1586
Ireland	Both	-1.9302	0.6523
Israel	Both	-1.3062	0.3701
Italy	Both	-1.3495	0.5970
Jamaica	Both	0.0894	0.2772
Japan	Both	-2.7870	0.1831
Jordan	Both	-1.5247	0.3582
Kazakhstan	Both	-3.6584	0.4284
Kenya	Both	0.1020	0.0514
Kiribati	Both	0.0020	0.1435
Kuwait	Both	-0.5752	0.3419
Kyrgyzstan	Both	0.0568	0.2961
Laos	Both	-0.1540	0.4135
Latvia	Both	-3.6506	0.6285
Lebanon	Both	-0.3805	0.4105
Lesotho	Both	0.0630	0.2747
Liberia	Both	0.1350	0.0839
Libya	Both	0.4159	0.1594
Lithuania	Both	-3.8074	0.5553
Luxembourg	Both	-1.0529	0.7126
Macedonia	Both	-1.8694	0.4965

Madagascar	Both	0.1146	-0.0041
Malawi	Both	0.1181	0.1079
Malaysia	Both	0.1752	0.4443
Maldives	Both	-0.0742	0.5092
Mali	Both	-0.0406	0.2260
Malta	Both	-1.4748	0.6964
Marshall Islands	Both	0.0177	0.1458
Mauritania	Both	-0.0696	0.1641
Mauritius	Both	-0.0612	0.4204
Mexico	Both	-0.6672	0.4148
Moldova	Both	-3.4137	0.3260
Mongolia	Both	-0.0871	0.4462
Montenegro	Both	-0.3253	0.4273
Morocco	Both	0.0328	0.4590
Mozambique	Both	0.0058	0.2792
Myanmar	Both	-0.1355	0.5716
Namibia	Both	-0.0415	0.2289
Nepal	Both	-0.0857	0.4586
Netherlands	Both	-0.0280	0.5407
New Zealand	Both	-1.8618	0.3175
Nicaragua	Both	0.1219	0.3624
Niger	Both	0.0546	0.0880
Nigeria	Both	0.1753	0.2099
North Korea	Both	-0.0905	-0.0106
Northern Mariana Islands	Both	0.1350	0.0206
Norway	Both	-2.8595	0.2534

Oman	Both	-1.1741	0.3561
Pakistan	Both	-0.0590	0.2740
Palestine	Both	-0.0342	0.3398
Panama	Both	-0.0736	0.2812
Papua New Guinea	Both	0.0661	0.1545
Paraguay	Both	0.0346	0.3781
Peru	Both	0.0880	0.4002
Philippines	Both	-0.1566	0.2859
Poland	Both	-3.2639	0.8384
Portugal	Both	-2.3685	0.7151
Puerto Rico	Both	-2.0769	0.1897
Qatar	Both	-3.5491	0.0723
Romania	Both	-2.3517	0.6787
Russian Federation	Both	-2.9991	0.5222
Rwanda	Both	-0.0602	0.1121
Saint Lucia	Both	-0.0054	0.2473
Saint Vincent and the Grenadines	Both	0.0080	0.3716
Samoa	Both	0.0935	0.2075
Sao Tome and Principe	Both	0.1970	0.2142
Saudi Arabia	Both	-1.0675	0.4479
Senegal	Both	0.0789	0.1366
Serbia	Both	-1.0503	0.3838
Seychelles	Both	-0.2115	0.2794
Sierra Leone	Both	0.1408	0.1108
Singapore	Both	-2.7263	0.3441
Slovakia	Both	0.0124	0.5755

Slovenia	Both	-1.7379	0.4398
Solomon Islands	Both	-0.0015	0.2144
Somalia	Both	0.1278	-0.0910
South Africa	Both	0.0337	0.1530
South Korea	Both	-0.8574	0.4114
South Sudan	Both	0.1740	-0.0724
Spain	Both	-2.4338	0.6913
Sri Lanka	Both	-2.0541	0.3542
Sudan	Both	-0.0214	0.4138
Suriname	Both	-0.0026	0.2426
Swaziland	Both	-0.0084	0.1575
Sweden	Both	-1.3431	0.6168
Switzerland	Both	-2.2598	0.5452
Syria	Both	-0.0816	0.2331
Taiwan	Both	-2.7782	0.6802
Tajikistan	Both	-0.0167	0.2644
Tanzania	Both	0.2008	0.1485
Thailand	Both	0.0199	0.5174
The Bahamas	Both	0.0584	0.1444
The Gambia	Both	0.1217	0.0922
Timor-Leste	Both	0.0124	0.4085
Togo	Both	0.0951	0.1246
Tonga	Both	0.1342	0.2209
Trinidad and Tobago	Both	0.0073	0.3221
Tunisia	Both	-1.1921	0.4089
Turkey	Both	-1.7302	0.4458

Location	Sex	Annual change of death rate (%)	
Turkmenistan	Both	-0.0995	0.5147
Uganda	Both	-0.1103	0.2175
Ukraine	Both	-1.4756	0.3797
United Arab Emirates	Both	-0.2479	0.1431
United Kingdom	Both	-2.8714	0.5721
United States	Both	-1.2337	0.4553
Uruguay	Both	-0.6080	0.6032
Uzbekistan	Both	0.0838	0.6019
Vanuatu	Both	-0.0084	0.1535
Venezuela	Both	-0.8607	0.1965
Vietnam	Both	-2.1627	0.4692
Virgin Islands, U.S.	Both	-1.0455	0.2191
Yemen	Both	0.0341	0.2715
Zambia	Both	0.1267	0.1122
Zimbabwe	Both	0.1490	-0.0329

ASIR: age-standardized incidence rate; RHD: rheumatic heart disease; NRVHD: no-rheumatic valvular heart disease

Supplemental Table 3. Annual change of death rates for RHD and NRVHD among 195 countries and territories from 1990 to 2017.

		RHD	NRVHD
Afghanistan	Both	-2.1883	-0.0738
Albania	Both	-4.8734	-2.0179
Algeria	Both	-3.8360	-0.4459
American Samoa	Both	-1.1549	0.1620
Andorra	Both	-2.5571	-0.5790
Angola	Both	-3.8199	-0.5244
Antigua and Barbuda	Both	-2.3492	-0.7474
Argentina	Both	-1.4491	-0.0775
Armenia	Both	-2.8203	2.5731
Australia	Both	-2.6022	-0.2426
Austria	Both	-2.8701	1.4128
Azerbaijan	Both	-0.8882	1.5662
Bahrain	Both	-3.4775	-1.4907
Bangladesh	Both	-1.4756	-0.2335
Barbados	Both	-2.2643	-0.0909
Belarus	Both	-5.0669	-0.0238
Belgium	Both	0.0943	0.1312
Belize	Both	-2.5965	0.3011
Benin	Both	-2.5591	0.2099
Bermuda	Both	-4.3183	-1.0491
Bhutan	Both	-3.9890	-0.1790
Bolivia	Both	-3.7658	-0.7016
Bosnia and Herzegovina	Both	-1.3517	0.8354
Botswana	Both	-3.5819	-0.4913
Brazil	Both	-2.5889	0.2528

Brunei	Both	-2.4586	0.7728
Bulgaria	Both	-4.3856	-0.3004
Burkina Faso	Both	-1.3981	0.8068
Burundi	Both	-4.2842	-2.6787
Cambodia	Both	-5.6838	-0.3129
Cameroon	Both	-2.7352	0.0794
Canada	Both	-2.2712	0.6700
Cape Verde	Both	-4.3475	0.8051
Central African Republic	Both	-1.4010	-0.6111
Chad	Both	-1.5545	0.3457
Chile	Both	-4.7433	-0.4741
China	Both	-4.9745	-1.4521
Colombia	Both	-5.8487	0.5932
Comoros	Both	-4.0811	-2.1156
Congo	Both	-3.5350	-0.7283
Costa Rica	Both	-2.4574	0.9584
Cote d'Ivoire	Both	-1.8213	0.4458
Croatia	Both	-4.4176	1.4757
Cuba	Both	-2.0421	-0.0655
Cyprus	Both	-3.7541	-0.7986
Czech Republic	Both	-4.9470	4.2221
Democratic Republic of the Congo	Both	-1.9971	-0.3887
Denmark	Both	-4.7750	1.3974
Djibouti	Both	-3.4306	-1.5922
Dominica	Both	-2.0641	0.2415
Dominican Republic	Both	-1.9858	-0.1402

Ecuador	Both	-2.7984	0.6278
Egypt	Both	-3.2328	0.2511
El Salvador	Both	-1.9326	-0.4759
Equatorial Guinea	Both	-7.4748	-0.9067
Eritrea	Both	-3.9827	-1.7136
Estonia	Both	-5.5692	4.9236
Ethiopia	Both	-4.9524	-1.9327
Federated States of Micronesia	Both	-2.2071	-0.5232
Fiji	Both	-1.8540	-1.1049
Finland	Both	-5.6190	0.2385
France	Both	-2.1165	-0.7993
Gabon	Both	-3.5528	-0.8888
Georgia	Both	3.4444	3.5281
Germany	Both	-1.6296	0.5954
Ghana	Both	-2.3267	1.0820
Greece	Both	-3.3581	0.6499
Greenland	Both	-3.2823	-0.2437
Grenada	Both	-3.1114	-0.9375
Guam	Both	-1.6537	0.3983
Guatemala	Both	-2.7730	-0.3907
Guinea	Both	-1.6695	0.6347
Guinea-Bissau	Both	-2.5301	-0.0743
Guyana	Both	-1.9407	-0.5026
Haiti	Both	-2.8249	-0.3165
Honduras	Both	-2.2991	0.5421
Hungary	Both	-5.6069	1.2054

Iceland	Both	-1.7258	0.3852
India	Both	-1.4144	0.4692
Indonesia	Both	-4.4021	0.4429
Iran	Both	-2.4944	0.5401
Iraq	Both	-6.7756	-3.7143
Ireland	Both	-3.7876	-0.1095
Israel	Both	-2.0176	-0.4707
Italy	Both	-2.4669	0.7646
Jamaica	Both	-2.9977	0.2166
Japan	Both	-3.7236	0.1932
Jordan	Both	-4.5790	-0.8386
Kazakhstan	Both	-3.5232	0.0787
Kenya	Both	-2.4345	-0.7028
Kiribati	Both	-1.2098	0.1690
Kuwait	Both	-5.1599	-0.4155
Kyrgyzstan	Both	-3.9825	-1.8762
Laos	Both	-5.9120	-0.6700
Latvia	Both	-6.0446	2.4279
Lebanon	Both	-4.9471	-0.7783
Lesotho	Both	-0.8793	0.7450
Liberia	Both	-2.4579	-0.0692
Libya	Both	-3.2003	0.1057
Lithuania	Both	-5.1922	2.7064
Luxembourg	Both	-2.5325	0.2777
Macedonia	Both	-4.5952	-2.0127
Madagascar	Both	-2.2322	-0.8236

Malawi	Both	-2.9854	-0.7533
Malaysia	Both	-5.5885	0.4572
Maldives	Both	-8.1992	-1.5389
Mali	Both	-3.4676	-0.3701
Malta	Both	-2.0881	0.4090
Marshall Islands	Both	-1.4561	-0.1101
Mauritania	Both	-4.2549	-0.8273
Mauritius	Both	-4.6534	-0.5465
Mexico	Both	-4.3419	0.7462
Moldova	Both	-5.1458	-0.3948
Mongolia	Both	-3.8763	-0.4004
Montenegro	Both	-1.9033	0.3632
Morocco	Both	-3.4892	0.1264
Mozambique	Both	-2.4821	-0.4604
Myanmar	Both	-4.3816	-0.8482
Namibia	Both	-4.2378	-0.9214
Nepal	Both	-2.6982	0.3467
Netherlands	Both	-0.7466	-0.4226
New Zealand	Both	-2.4733	0.3990
Nicaragua	Both	-4.4313	-1.3911
Niger	Both	-2.5717	-0.2711
Nigeria	Both	-3.5745	-0.6690
North Korea	Both	-1.3819	-0.3505
Northern Mariana Islands	Both	-1.7778	-1.3075
Norway	Both	-2.9738	-0.5478
Oman	Both	-5.1354	-1.5108

Pakistan	Both	-1.7289	0.7818
Palestine	Both	-3.8647	-0.2026
Panama	Both	-3.9023	-1.8566
Papua New Guinea	Both	-1.2704	-0.4425
Paraguay	Both	-1.8303	1.8900
Peru	Both	-2.8904	-2.1016
Philippines	Both	-2.7841	-2.1756
Poland	Both	-5.8263	0.7752
Portugal	Both	-3.6540	0.9533
Puerto Rico	Both	-3.4981	-0.6846
Qatar	Both	-7.4063	-5.0752
Romania	Both	-5.2094	-1.4255
Russian Federation	Both	-4.8460	1.8536
Rwanda	Both	-5.8677	-2.5248
Saint Lucia	Both	-3.3595	-0.7351
Saint Vincent and the Grenadines	Both	-2.2445	-0.7523
Samoa	Both	-1.3228	-0.2538
Sao Tome and Principe	Both	-1.8483	1.0545
Saudi Arabia	Both	-4.1315	-0.2362
Senegal	Both	-2.1945	0.1424
Serbia	Both	-2.9875	1.3351
Seychelles	Both	-3.7451	-1.1190
Sierra Leone	Both	-1.9981	0.4395
Singapore	Both	-7.0144	-2.0471
Slovakia	Both	-2.6503	2.0225
Slovenia	Both	-2.7406	2.2082

Solomon Islands	Both	-1.4019	-0.2881
Somalia	Both	-2.2612	-1.4785
South Africa	Both	-2.2847	-0.5196
South Korea	Both	-3.6132	0.6801
South Sudan	Both	-2.2449	-1.7907
Spain	Both	-3.3208	0.6338
Sri Lanka	Both	-2.8834	-1.1049
Sudan	Both	-3.8494	-0.3822
Suriname	Both	-2.3500	0.1359
Swaziland	Both	-1.9735	-0.3866
Sweden	Both	-2.2147	0.5326
Switzerland	Both	-5.0966	-0.2276
Syria	Both	-7.3571	-2.3164
Taiwan	Both	-6.4198	-0.8856
Tajikistan	Both	-3.4432	0.1758
Tanzania	Both	-3.2060	-1.1644
Thailand	Both	-8.7188	0.7436
The Bahamas	Both	-1.8389	0.0400
The Gambia	Both	-2.1246	0.4415
Timor-Leste	Both	-5.2072	0.0141
Togo	Both	-2.3300	0.1772
Tonga	Both	-2.1921	-0.5320
Trinidad and Tobago	Both	-3.7625	-0.7887
Tunisia	Both	-3.5351	-0.2753
Turkey	Both	-4.7614	-1.2601
Turkmenistan	Both	-2.8244	0.3081

Uganda	Both	-3.3210	-0.8612
Ukraine	Both	-2.1118	1.9882
United Arab Emirates	Both	-2.1963	0.2110
United Kingdom	Both	-4.1094	-0.0716
United States	Both	-1.7026	0.2578
Uruguay	Both	-1.6992	1.2550
Uzbekistan	Both	-1.6244	3.7237
Vanuatu	Both	-1.1249	-0.0712
Venezuela	Both	-4.5442	0.1353
Vietnam	Both	-4.0192	-0.6398
Virgin Islands, U.S.	Both	-1.8695	0.3221
Yemen	Both	-2.9489	-0.2006
Zambia	Both	-2.9248	-0.9593
Zimbabwe	Both	0.7018	0.2836

RHD: rheumatic heart disease; NRVHD: no-rheumatic valvular heart disease

Supplemental Table 4 Annual change of DALYs rates for RHD and NRVHD among 195 countries and territories from 1990 to 2017.

Location	Sex	Annual change of DALYs rate (%)	
		RHD	NRVHD
Afghanistan	Both	-2.1783	0.0052
Albania	Both	-2.9158	-1.6119
Algeria	Both	-2.8661	-0.5901
American Samoa	Both	-0.8128	0.2897
Andorra	Both	-2.9721	-0.8530
Angola	Both	-3.6583	-0.7131
Antigua and Barbuda	Both	-1.8488	-0.8798
Argentina	Both	-1.6604	-0.3550
Armenia	Both	-3.0360	1.0526
Australia	Both	-3.0034	-0.9344
Austria	Both	-3.9156	0.3423
Azerbaijan	Both	-1.2317	0.9366
Bahrain	Both	-3.7099	-1.6467
Bangladesh	Both	-2.2524	-0.3923
Barbados	Both	-1.5164	-0.2762
Belarus	Both	-5.5831	0.0302
Belgium	Both	-0.6221	-0.6005
Belize	Both	-1.7921	0.4548
Benin	Both	-2.2960	0.0929
Bermuda	Both	-4.8970	-1.4964
Bhutan	Both	-4.2131	-0.3627
Bolivia	Both	-3.6903	-0.9788
Bosnia and Herzegovina	Both	-1.7042	0.3621
Botswana	Both	-2.6831	-0.9859

Brazil	Both	-1.8960	-0.3078
Brunei	Both	-2.7660	0.5142
Bulgaria	Both	-4.3980	-0.0988
Burkina Faso	Both	-1.3210	0.5407
Burundi	Both	-3.6061	-2.9726
Cambodia	Both	-5.1033	-0.4199
Cameroon	Both	-2.1079	0.0819
Canada	Both	-2.7199	0.0444
Cape Verde	Both	-3.2730	0.3595
Central African Republic	Both	-1.3099	-0.5865
Chad	Both	-1.3818	0.4078
Chile	Both	-5.5111	-0.5978
China	Both	-5.0069	-1.4276
Colombia	Both	-6.1354	0.2725
Comoros	Both	-3.3054	-2.4674
Congo	Both	-3.2925	-1.0071
Costa Rica	Both	-1.4278	0.9213
Cote d'Ivoire	Both	-1.5406	0.3756
Croatia	Both	-4.9615	0.6487
Cuba	Both	-1.8355	-0.1126
Cyprus	Both	-4.1286	-0.9581
Czech Republic	Both	-6.0256	2.5213
Democratic Republic of the Congo	Both	-1.8539	-0.4947
Denmark	Both	-5.5854	0.4574
Djibouti	Both	-2.4652	-1.7457
Dominica	Both	-1.5446	0.2643

Dominican Republic	Both	-1.7165	0.0080
Ecuador	Both	-1.9272	0.3801
Egypt	Both	-3.1430	0.0868
El Salvador	Both	-1.1113	-0.3704
Equatorial Guinea	Both	-6.5096	-1.4110
Eritrea	Both	-3.5092	-2.0446
Estonia	Both	-6.0154	3.2905
Ethiopia	Both	-3.8699	-2.0664
Federated States of Micronesia	Both	-2.1540	-0.5360
Fiji	Both	-1.6312	-1.1326
Finland	Both	-5.9645	-0.2371
France	Both	-2.6568	-1.2788
Gabon	Both	-2.7984	-0.9944
Georgia	Both	1.2301	2.9070
Germany	Both	-2.8956	-0.0315
Ghana	Both	-1.8271	0.7910
Greece	Both	-3.4777	0.2912
Greenland	Both	-3.6462	-0.7806
Grenada	Both	-2.7991	-0.8046
Guam	Both	-0.7347	0.8422
Guatemala	Both	-1.2832	-0.2871
Guinea	Both	-1.8205	0.6352
Guinea-Bissau	Both	-2.4003	-0.1101
Guyana	Both	-1.6471	-0.5226
Haiti	Both	-3.1910	-0.5419
Honduras	Both	-0.9435	0.1155

Hungary	Both	-6.4353	0.3453
Iceland	Both	-2.1623	0.0231
India	Both	-1.8341	0.2704
Indonesia	Both	-4.1960	0.1628
Iran	Both	-2.3850	0.0670
Iraq	Both	-4.9279	-3.3919
Ireland	Both	-4.2769	-0.6055
Israel	Both	-2.6927	-0.8012
Italy	Both	-3.6481	-0.3378
Jamaica	Both	-2.0449	0.5922
Japan	Both	-4.5004	-0.8195
Jordan	Both	-5.4944	-1.4628
Kazakhstan	Both	-4.3845	0.1056
Kenya	Both	-1.5390	-0.7944
Kiribati	Both	-1.2655	0.0271
Kuwait	Both	-5.5182	-0.6276
Kyrgyzstan	Both	-3.6745	-1.3932
Laos	Both	-5.6335	-0.7478
Latvia	Both	-6.3586	1.7495
Lebanon	Both	-5.6763	-1.0266
Lesotho	Both	-0.5843	0.6899
Liberia	Both	-2.4902	-0.2014
Libya	Both	-2.7214	0.1620
Lithuania	Both	-5.6190	2.0549
Luxembourg	Both	-3.1300	-0.2372
Macedonia	Both	-4.5741	-1.1429

Madagascar	Both	-2.3384	-1.2101
Malawi	Both	-2.1511	-0.6840
Malaysia	Both	-3.9585	0.2717
Maldives	Both	-7.3886	-2.1751
Mali	Both	-3.0897	-0.4198
Malta	Both	-2.2366	0.2168
Marshall Islands	Both	-1.1523	0.0290
Mauritania	Both	-3.4294	-0.9351
Mauritius	Both	-3.3247	-0.5054
Mexico	Both	-3.9463	0.5143
Moldova	Both	-5.5308	0.0542
Mongolia	Both	-3.2472	-0.4083
Montenegro	Both	-2.3225	0.0342
Morocco	Both	-3.2459	-0.0919
Mozambique	Both	-2.0367	-0.5255
Myanmar	Both	-3.8476	-0.8254
Namibia	Both	-3.5290	-1.2258
Nepal	Both	-3.0506	0.0354
Netherlands	Both	-1.8217	-1.1710
New Zealand	Both	-2.7984	-0.2852
Nicaragua	Both	-2.4365	-1.2198
Niger	Both	-2.7983	-0.3360
Nigeria	Both	-2.5548	-0.6926
North Korea	Both	-1.0815	-0.2263
Northern Mariana Islands	Both	-1.1389	-1.1575
Norway	Both	-3.6349	-1.0982

Oman	Both	-6.3859	-1.7752
Pakistan	Both	-1.7722	0.4680
Palestine	Both	-2.4269	-0.5966
Panama	Both	-2.3525	-1.5462
Papua New Guinea	Both	-1.2740	-0.4752
Paraguay	Both	-0.9749	1.6386
Peru	Both	-1.8133	-1.8770
Philippines	Both	-1.8842	-1.3620
Poland	Both	-6.7573	0.0961
Portugal	Both	-4.8671	0.3322
Puerto Rico	Both	-3.4828	-0.6989
Qatar	Both	-8.1996	-4.2419
Romania	Both	-6.4422	-1.0785
Russian Federation	Both	-5.4968	1.4626
Rwanda	Both	-4.5607	-2.8732
Saint Lucia	Both	-2.7154	-0.7127
Saint Vincent and the Grenadines	Both	-1.4582	-0.5451
Samoa	Both	-1.5278	-0.5069
Sao Tome and Principe	Both	-2.0970	0.7582
Saudi Arabia	Both	-5.0450	-0.2270
Senegal	Both	-1.8920	0.0326
Serbia	Both	-3.8612	0.2585
Seychelles	Both	-2.5081	-1.1647
Sierra Leone	Both	-2.0064	0.3584
Singapore	Both	-7.0887	-1.6284
Slovakia	Both	-3.2246	1.0163

Slovenia	Both	-3.6499	0.9556
Solomon Islands	Both	-1.4603	-0.3858
Somalia	Both	-1.9913	-1.5510
South Africa	Both	-2.2821	-1.1862
South Korea	Both	-5.0465	-0.5317
South Sudan	Both	-1.6744	-1.6933
Spain	Both	-4.3483	-0.1400
Sri Lanka	Both	-3.4247	-1.0030
Sudan	Both	-4.0250	-0.4717
Suriname	Both	-1.8842	0.1139
Swaziland	Both	-1.4589	-0.3065
Sweden	Both	-2.8987	-0.2309
Switzerland	Both	-5.6585	-0.7369
Syria	Both	-6.3851	-2.2246
Taiwan	Both	-6.3901	-1.0296
Tajikistan	Both	-2.9198	0.2857
Tanzania	Both	-1.8842	-1.1769
Thailand	Both	-5.0176	0.5409
The Bahamas	Both	-1.2187	-0.0102
The Gambia	Both	-1.7410	0.3568
Timor-Leste	Both	-5.0584	-0.1383
Togo	Both	-2.0616	0.1174
Tonga	Both	-1.4744	-0.3303
Trinidad and Tobago	Both	-2.5067	-0.6470
Tunisia	Both	-4.7928	-0.3517
Turkey	Both	-5.1114	-1.3231

Turkmenistan	Both	-2.3753	0.3784
Uganda	Both	-2.3651	-0.9709
Ukraine	Both	-1.8244	1.7720
United Arab Emirates	Both	-2.0080	0.1209
United Kingdom	Both	-4.6335	-0.5607
United States	Both	-2.1777	-0.2929
Uruguay	Both	-2.1410	0.8115
Uzbekistan	Both	-2.0444	2.7248
Vanuatu	Both	-1.1264	-0.1353
Venezuela	Both	-4.7453	0.0364
Vietnam	Both	-4.4617	-0.6402
Virgin Islands, U.S.	Both	-2.2040	0.1887
Yemen	Both	-3.2103	-0.3386
Zambia	Both	-2.2184	-1.0925
Zimbabwe	Both	0.8598	0.5012

RHD: rheumatic heart disease; NRVHD: no-rheumatic valvular heart disease

Figure S1. Trend of incidence, mortality, and DALY rates for non-rheumatic valvular heart disease (NRVHD), non-rheumatic calcific aortic valve disease (NRCAVD), and non-rheumatic degenerative mitral valve disease (NRDMVD) from low SDI to high SDI among persons aged ≥ 70 years. A-C: Incidence; D-F: Mortality; G-I: DALY rate.

