

**Trends and Projections of Global Gynaecological Cancer Burden:
Age-Period-Cohort Insights from Global Burden of Disease 2021**

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Global and Regional Burden of Cervical Cancer

According to the number of cervical cancer cases, deaths, and DALYs (Disability-Adjusted Life Years) in 2021, along with their age-standardised rates, the burden of cervical cancer across five quintiles of the Socio-Demographic Index (SDI) ranks from highest to lowest as follows: high SDI, medium-high SDI, medium SDI, medium-low SDI, and low SDI regions. Among the 21 GBD (Global Burden of Disease) regions, the burden of disease is most severe in Central Sub-Saharan Africa and Southern Sub-Saharan Africa. Based on percentage changes in Age-Standardised Incidence Rates (ASIR), Age-Standardised Mortality Rates (ASMR), and Age-Standardised Disability Rates (ASDR) from 1990 to 2021, the disease burden has generally decreased across all SDI regions, with the highest reduction observed in high SDI regions. In the 21 GBD regions, with the exception of East Asia and Eastern Europe where ASIR increased, the disease burden has decreased in all regions, with Australasia experiencing the most significant reduction. The global disease situation has improved.

	Incidence (95% UI)			Deaths (95% UI)			DALYs (95% UI)		
	2021 counts	2021 ASR per 100,000 people	Percentage change in ASR, 1990-2021	2021 counts	2021 ASR per 100,000 people	Percentage change in ASR, 1990-2021	2021 counts	2021 ASR per 100,000 people	Percentage change in ASR, 1990-2021
Global	667426 (613030,726422)	15.32 (14.08,16.68)	-0.15 (-0.23,-0.07)	296667 (272059,321906)	6.62 (6.07,7.18)	-0.32 (-0.38,-0.25)	9911653 (9053317,10798306)	226.28 (206.51,246.86)	-0.31 (-0.38,-0.24)
SDI									
High SDI	78008 (73679,81041)	10.3 (9.91,10.66)	-0.37 (-0.39,-0.35)	25893 (23323,27330)	2.62 (2.44,2.74)	-0.48 (-0.5,-0.46)	707650 (664623,741914)	86.41 (82.45,90.3)	-0.47 (-0.49,-0.45)
High-middle SDI	120153 (103649,137728)	13.27 (11.44,15.16)	-0.01 (-0.16,0.15)	46301 (40583,52537)	4.59 (4.02,5.2)	-0.33 (-0.42,-0.23)	1432108 (1252618,1634549)	152.9 (133.88,174.32)	-0.31 (-0.42,-0.21)
Middle SDI	228240 (204617,254212)	15.94 (14.3,17.75)	-0.12 (-0.22,0)	96294 (86730,106487)	6.72 (6.05,7.43)	-0.36 (-0.43,-0.28)	3167322 (2856722,3510378)	218.95 (197.6,242.31)	-0.36 (-0.43,-0.28)
Low-middle SDI	152720 (136721,169314)	17.79 (15.94,19.7)	-0.21 (-0.32,-0.08)	78178 (69940,86259)	9.71 (8.67,10.7)	-0.34 (-0.44,-0.23)	2751152 (2455070,3056560)	321.36 (287.11,356.77)	-0.36 (-0.46,-0.26)
Low SDI	87633 (73984,103872)	25.47 (21.57,30.12)	-0.26 (-0.39,-0.12)	49687 (42208,59246)	16.36 (13.94,19.38)	-0.33 (-0.45,-0.21)	1843208 (1552008,2199867)	535.11 (454.02,638.34)	-0.36 (-0.47,-0.23)
GBD regions									
Andean Latin America	9757 (7476,12359)	29.79 (22.83,37.66)	-0.1 (-0.3,0.16)	4435 (3432,5550)	14.02 (10.85,17.51)	-0.33 (-0.46,-0.14)	140301 (107733,176561)	431.74 (331.78,543.15)	-0.35 (-0.49,-0.17)
Australasia	1752 (1576,1925)	8.51 (7.66,9.35)	-0.5 (-0.57,-0.43)	469 (413,515)	1.85 (1.66,2.02)	-0.65 (-0.69,-0.61)	13292 (12053,14534)	61.68 (56.34,67.5)	-0.65 (-0.69,-0.61)
Caribbean	7382 (6192,8712)	27.58 (23.09,32.63)	-0.12 (-0.27,0.04)	3397 (2862,4026)	12.31 (10.33,14.68)	-0.25 (-0.38,-0.1)	115954 (95882,140764)	433.17 (356.8,526.53)	-0.23 (-0.37,-0.06)
Central Asia	7179 (6266,8081)	14.17 (12.38,15.92)	-0.22 (-0.32,-0.12)	3093 (2735,3497)	6.33 (5.62,7.13)	-0.34 (-0.41,-0.25)	108285 (94718,122647)	213.84 (187.54,241.95)	-0.33 (-0.41,-0.24)
Central Europe	14203 (12928,15545)	15.93 (14.45,17.53)	-0.26 (-0.34,-0.18)	6590 (6055,7118)	6.02 (5.53,6.53)	-0.41 (-0.46,-0.35)	181664 (166208,196950)	191.83 (175.35,209.14)	-0.44 (-0.49,-0.39)
Central Latin America	40343 (34554,46252)	28.89 (24.76,33.1)	-0.31 (-0.41,-0.21)	13108 (11286,14974)	9.52 (8.21,10.86)	-0.53 (-0.6,-0.47)	441930 (380717,508808)	315.97 (272.32,363.77)	-0.5 (-0.57,-0.42)
Central Sub-Saharan Africa	15328 (10594,20549)	38 (26.28,50.98)	-0.04 (-0.28,0.31)	8913 (6175,12102)	25.1 (17.45,33.97)	-0.12 (-0.35,0.19)	330691 (228131,448104)	813.59 (562.84,1104.29)	-0.14 (-0.36,0.17)
East Asia	137864 (101144,177755)	13.4 (9.86,17.38)	0.1 (-0.28,0.51)	52032 (39400,66510)	4.68 (3.55,5.98)	-0.34 (-0.56,-0.11)	1616240 (1195414,2080057)	151.15 (111.8,195.41)	-0.35 (-0.57,-0.11)
Eastern Europe	25339 (22883,27756)	16.49 (14.8,18.1)	0.1 (-0.02,0.23)	9929 (8990,10954)	5.5 (4.96,6.07)	-0.27 (-0.35,-0.2)	320236 (289146,353815)	200.77 (180.38,221.47)	-0.16 (-0.25,-0.06)
Eastern Sub-Saharan Africa	41370 (33124,52883)	33.45 (27.17,42.12)	-0.27 (-0.42,-0.07)	23270 (18793,29150)	21.68 (17.79,26.85)	-0.34 (-0.48,-0.17)	876849 (701728,1106312)	709.49 (572.26,890.6)	-0.37 (-0.51,-0.19)
High-income Asia Pacific	15578 (14044,16882)	11.03 (10.25,11.95)	-0.07 (-0.14,0.02)	5074 (4303,5602)	2.53 (2.28,2.73)	-0.41 (-0.45,-0.36)	132808 (119523,144704)	87.68 (81.63,94.36)	-0.34 (-0.4,-0.28)
High-income North America	30415 (29096,31622)	12.69 (12.19,13.22)	-0.35 (-0.38,-0.33)	7965 (7392,8348)	2.64 (2.5,2.75)	-0.29 (-0.32,-0.27)	240100 (229390,250584)	92.68 (88.88,96.91)	-0.3 (-0.33,-0.28)
North Africa and Middle East	12913 (11008,15182)	4.72 (4.04,5.5)	-0.21 (-0.35,-0.08)	6268 (5329,7273)	2.55 (2.17,2.93)	-0.36 (-0.48,-0.25)	217737 (182979,258586)	80.04 (67.65,93.68)	-0.39 (-0.5,-0.28)
Oceania	1372 (1070,2017)	27.31 (21.47,39.68)	-0.2 (-0.36,0.03)	662 (520,982)	15.27 (12.1,22.32)	-0.23 (-0.37,-0.01)	25245 (19486,37774)	499.47 (390.49,739.25)	-0.24 (-0.4,0)
South Asia	132482 (114541,151295)	15.54 (13.47,17.71)	-0.34 (-0.47,-0.2)	70315 (61026,79858)	8.72 (7.57,9.88)	-0.45 (-0.56,-0.33)	2432061 (2097850,2773134)	285.98 (247.23,325.23)	-0.48 (-0.58,-0.36)
Southeast Asia	58017 (49191,67747)	15.17 (12.91,17.65)	-0.16 (-0.3,0)	27513 (23669,31860)	7.45 (6.43,8.59)	-0.3 (-0.41,-0.17)	931501 (800257,1086328)	241.92 (207.75,281.44)	-0.33 (-0.44,-0.21)
Southern Latin America	9302 (8566,10068)	22.8 (21.07,24.73)	-0.07 (-0.16,0.04)	3832 (3515,4167)	8.56 (7.89,9.28)	-0.29 (-0.35,-0.22)	123079 (114520,133155)	296.76 (276.24,321.05)	-0.29 (-0.35,-0.22)
Southern Sub-Saharan Africa	16247 (14189,18418)	42.4 (37.16,47.85)	0.42 (0.08,0.76)	8524 (7477,9540)	23.9 (21.02,26.67)	0.37 (0.05,0.69)	300881 (260870,338893)	788.82 (685.47,885.31)	0.31 (0.03)
Tropical Latin America	27823 (26275,29199)	20.27 (19.16,21.27)	-0.12 (-0.17,-0.07)	11759 (10951,12429)	8.38 (7.82,8.86)	-0.37 (-0.4,-0.33)	395392 (372667,414907)	285.57 (269.19,299.68)	-0.32 (-0.36,-0.28)
Western Europe	27922 (26003,29391)	8.71 (8.25,9.11)	-0.39 (-0.42,-0.36)	10362 (9192,11143)	2.29 (2.11,2.43)	-0.51 (-0.54,-0.49)	257408 (240181,272440)	72.71 (68.94,76.61)	-0.51 (-0.53,-0.49)
Western Sub-Saharan Africa	34839 (26668,42613)	24.11 (18.93,29.1)	-0.08 (-0.28,0.14)	19157 (15042,23007)	15.57 (12.55,18.53)	-0.15 (-0.33,0.05)	709998 (548746,865456)	490.75 (383.61,591.44)	-0.19 (-0.36,0)

Supplementary Table 1. The number of cervical cancer cases, deaths, and DALYs for 2021, along with their age-standardised rates, and the percentage changes in age-standardised rates from 1990 to 2021[1].

Global and Regional Burden of Breast Cancer

According to the number of breast cancer cases, deaths, and DALYs in 2021, along with their age-standardised rates, the highest ASIR is found in high SDI regions, while the highest ASMR and ASDR are observed in low SDI regions. Among the 21 GBD regions, High-income North America has the highest ASIR, and Southern Sub-Saharan Africa has the highest ASMR and ASDR. Based on percentage changes in ASIR, ASMR, and ASDR from 1990 to 2021, all three indicators have decreased in high SDI regions, while the ASIR has increased and ASMR and ASDR have decreased in medium-high SDI regions. In medium, medium-low, and low SDI regions, all three indicators have increased. In the 21 GBD regions, the disease burden has increased in most regions, although some regions have experienced a reduction in

burden. Globally, the ASIR has increased, while the ASMR and ASDR have decreased.

	Incidence (95% UI)			Deaths (95% UI)			DALYs (95% UI)		
	2021 counts	2021 ASR per 100,000 people	Percentage change in ASR, 1990-2021	2021 counts	2021 ASR per 100,000 people	Percentage change in ASR, 1990-2021	2021 counts	2021 ASR per 100,000 people	Percentage change in ASR, 1990-2021
Global	2082737 (1940351,2225083)	46.4 (43.26,49.56)	0.16 (0.09,0.24)	660925 (609171,707182)	14.55 (13.45,15.56)	-0.12 (-0.17,-0.07)	20254802 (18963376,21574429)	455.56 (426.64,485.3)	-0.1 (-0.15,-0.03)
SDI									
High SDI	724293 (661769,756433)	77.08 (71.83,79.93)	-0.03 (-0.06,0)	171460 (151342,182071)	15.44 (14.01,16.21)	-0.35 (-0.38,-0.32)	4323106 (3982603,4606054)	467.07 (437.15,493.59)	-0.35 (-0.37,-0.33)
High-middle SDI	506491 (457359,565100)	51.05 (46.06,57.18)	0.31 (0.18,0.48)	145935 (132528,158860)	13.87 (12.63,15.13)	-0.19 (-0.25,-0.11)	4190123 (3830406,4646696)	424.81 (387.63,471.98)	-0.21 (-0.28,-0.12)
Middle SDI	539058 (484448,597126)	37.16 (33.42,41.13)	0.81 (0.61,1.05)	181470 (163851,201763)	12.68 (11.44,14.1)	0.11 (0.0,0.23)	6040958 (5448280,6714089)	415.76 (375.54,461.93)	0.12 (0.0,0.25)
Low-middle SDI	235446 (212857,257146)	28.29 (25.52,30.93)	0.92 (0.71,1.17)	115822 (103991,127353)	14.59 (13.07,16.04)	0.45 (0.29,0.63)	4061108 (3659394,4465155)	478.07 (430.12,525.81)	0.44 (0.27,0.65)
Low SDI	75294 (66491,84810)	24.09 (21.34,26.87)	0.54 (0.3,0.85)	45424 (40170,50794)	16 (14.15,17.91)	0.31 (0.11,0.57)	1616943 (1414472,1832517)	488.24 (431.45,547.92)	0.28 (0.06,0.56)
GBD regions									
Andean Latin America	10811 (8459,13757)	33.61 (26.29,42.87)	0.7 (0.35,1.12)	4074 (3220,5146)	12.91 (10.2,16.33)	0.06 (-0.15,0.31)	128299 (101485,161614)	396.61 (313.9,498.23)	0.04 (-0.16,0.3)
Australasia	19631 (17425,21867)	80.89 (72.46,90.05)	-0.01 (-0.11,0.1)	4320 (3695,4877)	15.53 (13.68,17.26)	-0.41 (-0.47,-0.35)	112263 (100171,125177)	467.24 (421.83,517.78)	-0.42 (-0.47,-0.37)
Caribbean	14997 (12738,17183)	53.78 (45.62,61.72)	0.24 (0.07,0.41)	5594 (4717,6573)	19.62 (16.51,23.09)	0.01 (-0.13,0.16)	164237 (136995,194975)	595.42 (495.22,709.33)	0.01 (-0.13,0.17)
Central Asia	15356 (13707,17195)	30.97 (27.75,34.61)	-0.12 (-0.23,-0.01)	6608 (5910,7375)	13.83 (12.41,15.37)	-0.26 (-0.34,-0.17)	218124 (193869,245239)	435.31 (387.95,487.61)	-0.3 (-0.38,-0.2)
Central Europe	64593 (59371,69896)	61.24 (56.41,66.53)	0.35 (0.23,0.47)	24869 (22633,26979)	20.26 (18.54,21.98)	-0.06 (-0.13,0.03)	601489 (554531,650981)	568.54 (521.85,618.2)	-0.13 (-0.2,-0.05)
Central Latin America	76886 (66938,86943)	55.03 (47.96,62.21)	0.84 (0.61,1.09)	19331 (16885,21775)	14.06 (12.28,15.82)	0.15 (0.01,0.3)	631825 (546297,712823)	451.67 (390.99,509.57)	0.2 (0.04,0.35)
Central Sub-Saharan Africa	9871 (7334,12942)	27.13 (20.26,35.41)	0.55 (0.12,1.15)	6203 (4593,8212)	18.73 (14.12,24.76)	0.34 (-0.03,0.82)	220895 (162604,290795)	570.7 (422.23,755.79)	0.33 (-0.05,0.86)
East Asia	401076 (311440,503566)	37.12 (28.82,46.7)	1.07 (0.5,1.9)	92962 (73230,115384)	8.38 (6.59,10.4)	-0.07 (-0.31,0.27)	3077415 (2410862,3867299)	286.25 (223.86,360.41)	-0.05 (-0.31,0.32)
Eastern Europe	100229 (90096,111435)	52.53 (47.15,58.6)	0.29 (0.16,0.43)	35827 (31989,40502)	17.37 (15.49,19.72)	-0.03 (-0.13,0.09)	982060 (875900,1114904)	528.83 (468.97,603.45)	-0.12 (-0.22,0)
Eastern Sub-Saharan Africa	32051 (26933,38661)	29.33 (25.14,34.59)	0.52 (0.17,0.97)	19591 (16711,23394)	20.18 (17.52,23.63)	0.29 (0.02,0.66)	696917 (580914,850817)	592.34 (503.9,706.84)	0.26 (-0.05,0.68)
High-income Asia Pacific	96689 (84850,104794)	55.62 (50.49,59.45)	0.93 (0.78,1.08)	20088 (16719,22019)	9.26 (8.26,9.86)	0.31 (0.2,0.38)	539252 (480456,585168)	515.66 (484.07,546.49)	-0.42 (-0.44,-0.4)
High-income North America	294448 (271117,308293)	94.93 (89.02,98.93)	-0.22 (-0.25,-0.19)	58937 (52684,62514)	17.02 (15.54,17.93)	-0.39 (-0.42,-0.37)	1556038 (1449564,1659970)	396.09 (347.11,453.96)	0.6 (0.38,0.86)
North Africa and Middle East	126978 (113314,143147)	48.35 (43.13,54.48)	1.95 (1.57,2.4)	29523 (26059,33509)	12.2 (10.79,13.79)	0.66 (0.45,0.91)	1066152 (928275,1226829)	722.36 (592.29,892.63)	0.13 (-0.13,0.48)
Oceania	1565 (1279,1961)	33.39 (27.74,40.88)	0.12 (-0.1,0.42)	952 (780,1176)	22.22 (18.44,26.97)	0.13 (-0.09,0.44)	36055 (29016,45913)	436.69 (380.59,501.46)	0.39 (0.18,0.63)
South Asia	205357 (179412,235439)	24.62 (21.52,28.32)	0.88 (0.6,1.21)	105497 (92006,121287)	13.24 (11.54,15.28)	0.41 (0.19,0.66)	2231171 (1841702,2734840)	577.98 (476.91,706.99)	0.3 (0.09,0.55)
Southeast Asia	138058 (115121,167273)	36.15 (30.24,43.68)	0.78 (0.52,1.1)	65437 (54266,79834)	17.72 (14.76,21.52)	0.32 (0.12,0.56)	260522 (239741,280142)	584.98 (538.52,628.69)	-0.28 (-0.34,-0.22)
Southern Latin America	22700 (20872,24506)	50.25 (46.22,54.26)	0.05 (-0.04,0.15)	9955 (8956,10830)	20.59 (18.69,22.27)	-0.27 (-0.33,-0.2)	727270 (700612,785925)	728.94 (653.43,810.05)	0.42 (0.18,0.73)
Southern Sub-Saharan Africa	15045 (13504,16657)	42.12 (37.89,46.56)	0.68 (0.4,1.05)	8412 (7611,9303)	24.93 (22.64,27.46)	0.46 (0.23,0.81)	267239 (238396,298690)	728.94 (653.43,810.05)	0.42 (0.18,0.73)
Tropical Latin America	61666 (57707,65334)	43.87 (41.05,46.5)	0.46 (0.38,0.55)	23988 (22182,25488)	16.96 (15.7,18.02)	0.02 (-0.03,0.07)	747270 (700612,785925)	532.53 (499.38,559.9)	0.05 (-0.01,0.11)
Western Europe	331712 (299155,352006)	81.81 (76.45,86.11)	-0.02 (-0.06,0.02)	92829 (79698,100091)	18.01 (16.15,19.11)	-0.38 (-0.42,-0.35)	2124404 (1917420,2287177)	519.33 (479.72,554.46)	-0.41 (-0.43,-0.38)
Western Sub-Saharan Africa	43020 (32324,56626)	34.59 (26.92,44.38)	0.63 (0.25,1.16)	25927 (20169,33021)	23.07 (18.69,28.77)	0.39 (0.09,0.81)	882278 (663003,1145794)	668.25 (516.54,854.9)	0.36 (0.03,0.82)

Supplementary Table 2. The number of breast cancer cases, deaths, and DALYs for 2021, along with their age-standardised rates, and the percentage changes in age-standardised rates from 1990 to 2021[1].

Global and Regional Burden of Uterine Cancer

According to the number of uterine cancer cases, deaths, and DALYs in 2021, along with their age-standardised rates, the highest disease burden is found in high SDI regions. Among the 21 GBD regions, High-income North America has the highest ASIR, while the Caribbean has the highest Rate ASMR and ASDR. Based on percentage changes in ASIR, ASMR, and ASDR from 1990 to 2021, the ASIR has increased in all SDI regions. However, except for slight increases in the ASDR in medium-low SDI regions and in the ASMR in high, medium, and medium-low SDI regions, the ASMR and ASDR have decreased in most regions. In the 21 GBD regions,

the disease burden has increased in most areas, although some regions have experienced a reduction in burden. Globally, the ASIR has increased, while the ASMR and ASDR have decreased.

	Incidence (95% UI)			Deaths (95% UI)			DALYs (95% UI)		
	2021 counts	2021 ASR per 100,000 people	Percentage change in ASR, 1990-2021	2021 counts	2021 ASR per 100,000 people	Percentage change in ASR, 1990-2021	2021 counts	2021 ASR per 100,000 people	Percentage change in ASR, 1990-2021
Global	473614 (429916,513667)	10.36 (9.42,11.24)	0.17 (0.1,0.25)	97672 (86516,108062)	2.11 (1.87,2.34)	-0.19 (-0.25,-0.12)	2562943 (2291154,2846493)	56.15 (50.07,62.37)	-0.19 (-0.25,-0.1)
SDI									
High SDI	192348 (176602,200771)	19.55 (18.28,20.35)	0.42 (0.38,0.47)	31632 (27718,33735)	2.69 (2.41,2.84)	-0.04 (-0.08,0)	734544 (668472,783437)	71.79 (66.24,76.26)	0.02 (-0.02,0.06)
High-middle SDI	148225 (134698,163707)	14.23 (12.89,15.75)	0.2 (0.1,0.32)	26208 (23400,29081)	2.39 (2.13,2.66)	-0.25 (-0.31,-0.18)	687614 (619011,767227)	65.74 (58.93,73.57)	-0.27 (-0.34,-0.18)
Middle SDI	89597 (73107,106231)	6.09 (4.97,7.2)	0.24 (0.06,0.49)	22901 (19105,26696)	1.61 (1.35,1.87)	-0.27 (-0.37,-0.14)	657004 (537305,770072)	45.05 (36.88,52.7)	-0.28 (-0.39,-0.13)
Low-middle SDI	32819 (28267,40107)	4.13 (3.56,5.08)	0.4 (0.21,0.67)	12186 (10479,15343)	1.64 (1.42,2.07)	0.04 (-0.1,0.23)	347307 (295309,429622)	43.77 (37.41,54.37)	0.04 (-0.11,0.26)
Low SDI	9976 (7949,12808)	3.58 (2.87,4.59)	0.21 (-0.01,0.53)	4579 (3646,5910)	1.83 (1.46,2.36)	-0.01 (-0.18,0.24)	132394 (105243,170177)	46.8 (37.4,60.25)	-0.02 (-0.21,0.25)
GBD regions									
Andean Latin America	3143 (2333,4067)	9.97 (7.4,12.9)	0.18 (-0.11,0.54)	976 (730,1264)	3.17 (2.37,4.1)	-0.27 (-0.44,-0.07)	26092 (19387,33753)	82.94 (61.69,107.41)	-0.27 (-0.44,-0.07)
Australasia	3752 (3248,4218)	14.65 (12.84,16.34)	0.49 (0.28,0.72)	630 (520,714)	2.12 (1.78,2.39)	0.04 (-0.1,0.18)	14287 (12382,16061)	53.92 (47.26,60.21)	0.06 (-0.08,0.2)
Caribbean	4930 (4284,5674)	17.48 (15.17,20.1)	0.5 (0.29,0.72)	1544 (1334,1793)	5.38 (4.63,6.24)	0.26 (0.08,0.44)	40332 (34534,47029)	144.02 (122.94,168.01)	0.24 (0.06,0.44)
Central Asia	4813 (4250,5449)	9.71 (8.6,10.95)	-0.07 (-0.18,0.05)	1243 (1105,1404)	2.68 (2.43,0.1)	-0.27 (-0.35,-0.18)	36941 (32386,42249)	75.47 (66.42,85.96)	-0.29 (-0.38,-0.19)
Central Europe	23183 (20849,25383)	20.7 (18.66,22.7)	0.52 (0.35,0.69)	5520 (4946,6020)	4.17 (3.77,4.57)	0 (-0.1,0.09)	124598 (112856,136803)	105.93 (95.65,116.22)	-0.04 (-0.14,0.06)
Central Latin America	9848 (8611,11228)	7.08 (6.19,8.06)	0.6 (0.4,0.84)	2923 (2555,3300)	2.15 (1.88,2.42)	0.03 (-0.11,0.17)	81388 (70356,92791)	58.74 (50.83,66.9)	0.11 (-0.04,0.28)
Central Sub-Saharan Africa	1334 (862,1935)	4.07 (2.64,5.92)	0.28 (-0.15,0.88)	623 (405,898)	2.14 (1.41,3.16)	0.07 (-0.29,0.55)	18469 (11860,26670)	55.82 (36.31,80.74)	0.05 (-0.31,0.54)
East Asia	75544 (56834,103404)	6.73 (5.02,9.23)	0.2 (-0.14,0.73)	14233 (10580,19160)	1.25 (0.93,1.69)	-0.47 (-0.61,-0.26)	425142 (320035,571293)	38.29 (28.87,51.57)	-0.47 (-0.62,-0.23)
Eastern Europe	58604 (52898,64769)	29.7 (26.77,32.9)	0.48 (0.33,0.64)	10284 (9284,11435)	4.65 (4.18,5.2)	0.05 (-0.05,0.17)	270207 (242688,303332)	133.05 (118.82,149.61)	0.03 (-0.08,0.15)
Eastern Sub-Saharan Africa	3920 (2831,5438)	4.1 (3.5,5.9)	0.16 (-0.11,0.57)	1846 (1346,2528)	2.17 (1.59,2.95)	-0.04 (-0.25,0.27)	53314 (38467,74534)	54.81 (39.9,75.48)	-0.07 (-0.29,0.27)
High-income Asia Pacific	13825 (12301,15052)	8.31 (7.57,9.04)	0.91 (0.76,1.12)	3937 (3194,4379)	1.65 (1.44,1.8)	-0.11 (-0.19,-0.01)	88362 (77557,96560)	47.34 (42.79,51.08)	0 (-0.1,0.13)
High-income North America	103521 (96172,108661)	31.78 (29.88,33.21)	0.59 (0.53,0.64)	13051 (11659,13866)	3.57 (3.23,3.77)	0.21 (0.17,0.25)	329721 (303830,353327)	98.72 (91.5,105.63)	0.29 (0.25,0.34)
North Africa and Middle East	17293 (12672,20569)	7.07 (5.17,8.4)	0.79 (0.41,1.26)	2895 (2192,3444)	1.34 (1.01,1.6)	-0.02 (-0.22,0.22)	86201 (65583,103000)	35.71 (27.12,42.52)	-0.02 (-0.22,0.23)
Oceania	353 (201,540)	8.19 (4.75,12.27)	0.18 (-0.15,0.74)	133 (76,202)	3.55 (2.06,5.32)	0.13 (-0.19,0.68)	4281 (2404,6666)	100.13 (56.81,152.2)	0.13 (-0.21,0.69)
South Asia	23668 (19818,31544)	2.99 (2.53,3.97)	0.46 (0.18,0.87)	9237 (7688,12339)	1.24 (1.03,1.66)	0.02 (-0.18,0.32)	256842 (214336,344465)	32.35 (27.04,43.28)	0.03 (-0.18,0.33)
Southeast Asia	25169 (17367,30769)	6.55 (4.56,7.99)	0.39 (0.16,0.7)	7379 (5307,9003)	2.03 (1.47,2.47)	0.02 (-0.15,0.24)	226682 (156601,279317)	59.51 (41.41,72.97)	0.03 (-0.16,0.26)
Southern Latin America	3330 (3006,3667)	7.2 (6.5,7.96)	-0.02 (-0.13,0.1)	997 (889,1092)	2 (1.79,2.18)	-0.32 (-0.4,-0.25)	23383 (21116,25642)	49.91 (45.26,55.08)	-0.34 (-0.41,-0.27)
Southern Sub-Saharan Africa	2239 (1694,2626)	6.47 (4.86,7.56)	0.8 (0.33,1.18)	955 (707,1115)	2.94 (2.15,3.41)	0.55 (0.12,0.91)	24997 (18912,29447)	72.06 (54.21,84.72)	0.53 (0.13,0.88)
Tropical Latin America	10338 (9586,10989)	7.27 (6.74,7.72)	0.23 (0.15,0.32)	3422 (3117,3657)	2.4 (2.19,2.57)	-0.16 (-0.21,-0.1)	87478 (80858,92650)	61.58 (56.94,65.2)	-0.12 (-0.17,-0.06)
Western Europe	80965 (72642,85885)	18.48 (17.01,19.49)	0.36 (0.28,0.44)	14032 (11932,15203)	2.53 (2.23,2.71)	-0.07 (-0.13,-0.01)	294933 (260748,317607)	63.54 (57.66,68.1)	-0.05 (-0.1,0)
Western Sub-Saharan Africa	3842 (2947,4938)	3.55 (2.73,4.5)	0.44 (0.17,0.83)	1811 (1396,2280)	1.9 (1.48,2.37)	0.23 (-0.02,0.57)	49292 (37907,63476)	45.23 (34.73,57.3)	0.17 (-0.05,0.5)

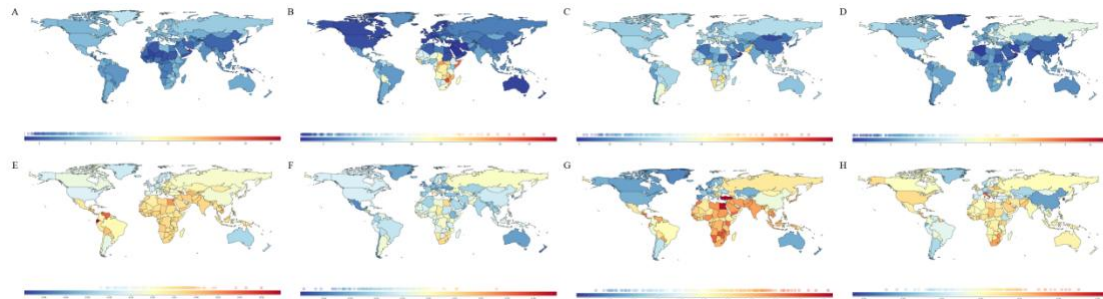
Supplementary Table 3. The number of uterine cancer cases, deaths, and DALYs for 2021, along with their age-standardised rates, and the percentage changes in age-standardised rates from 1990 to 2021[1].

National GCs Burden

The results show that the ASMR for OC is highest in the UAE, with lower rates in other regions (Supplementary Figure 1A). The ASMR for CC is higher in East Africa, while it is lower in North Africa and the Middle East (Supplementary Figure 1B). The ASMR for BC is highest in the UAE, followed by South Africa, with lower rates in other regions (Supplementary Figure 1C). The ASMR for UC is highest in the UAE, with lower rates in other regions (Supplementary Figure 1D).

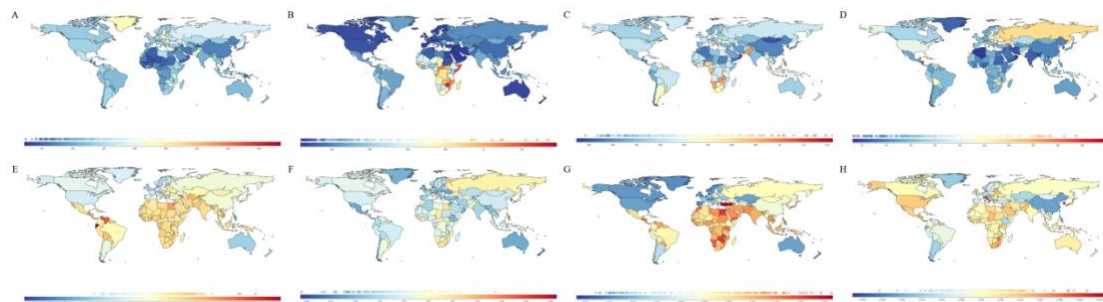
The Annual Percentage Change (APC) from 1990 to 2021 shows that the ASMR for OC has increased relatively significantly in Ecuador, Venezuela, and Georgia (Supplementary Figure 1E). The ASMR for CC has shown slight increases in Russia, Italy, South Africa, and Egypt, while decreasing in other regions (Supplementary Figure 1F). The ASMR for BC has increased relatively significantly in South Asia,

Africa, and the Middle East (Supplementary Figure 1G). The ASMR for UC has increased relatively significantly in Italy, with smaller or decreasing trends in other regions (Supplementary Figure 1H).



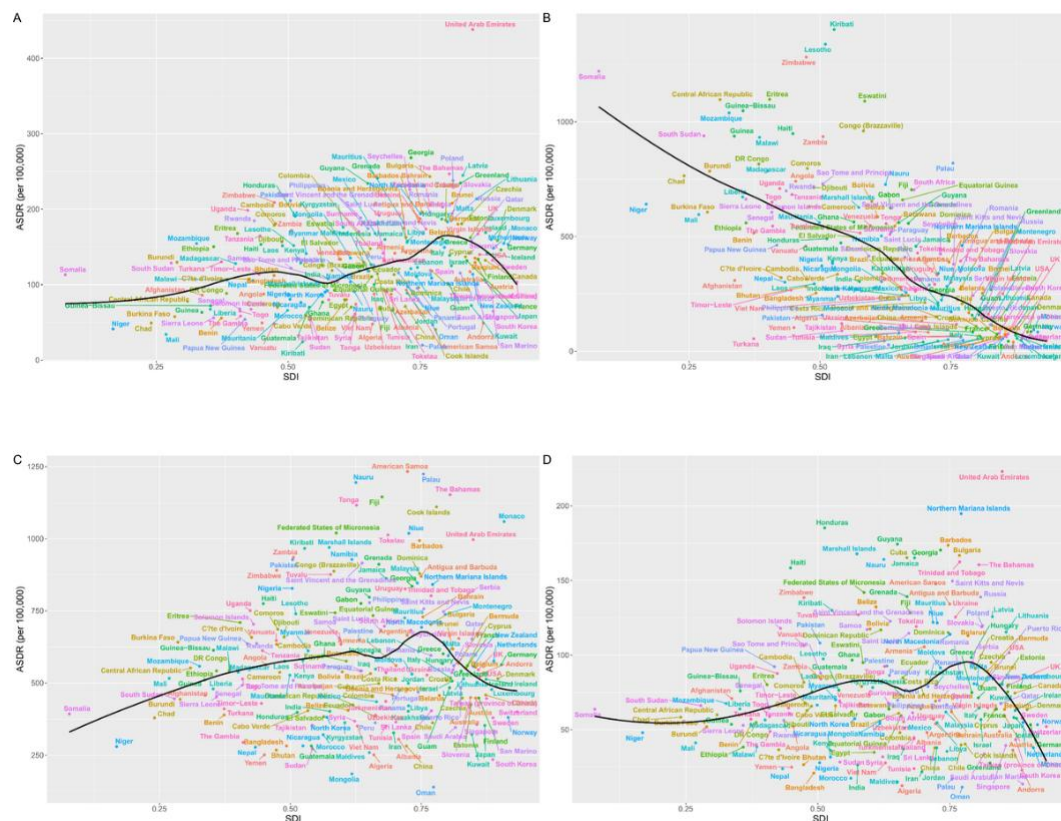
Supplementary Figure 1. ASMR for four types of GCs across 204 countries and regions in 2021, and their APC from 1990 to 2021. OC-ASMR (A), CC-ASMR (B), BC-ASMR (C), UC-ASMR (D), APC (E-H).

The Age-Standardised Death Rate (ASDR) patterns are generally consistent with the ASMR patterns (Supplementary Figure 2A-H).



Supplementary Figure 2. ASDR for four types of GCs across 204 countries and regions in 2021, and their Annual Percentage Change (APC) from 1990 to 2021. OC-ASDR (A), CC-ASDR (B), BC-ASDR (C), UC-ASDR (D), APC (E-H).

The ASMR for OC fluctuates and increases with SDI up to around 0.81, after which it decreases with increasing SDI (Supplementary Figure 3A). The ASMR for CC shows a negative correlation with SDI (Supplementary Figure 3B). The ASMR for BC fluctuates and increases with SDI up to around 0.75, then decreases with increasing SDI (Supplementary Figure 3C). The ASMR for UC fluctuates and increases with SDI up to around 0.81, after which it decreases with increasing SDI (Supplementary Figure 3D).



Supplementary Figure 4. ASDR burden of GCs across 204 countries and regions in 2021. OC (A), CC (B), BC (C), UC (D).

Global GCs Burden by Age

For all four types of GCs, the highest death toll occurs in the 40-59 and 60-79 age groups, while the lowest death toll occurs in those under 20 years old (for UC, the highest death toll occurs in the 60-79 age group, with no deaths in the <20 age group).

The mortality rate for all four types of GCs decreases as age groups become younger.

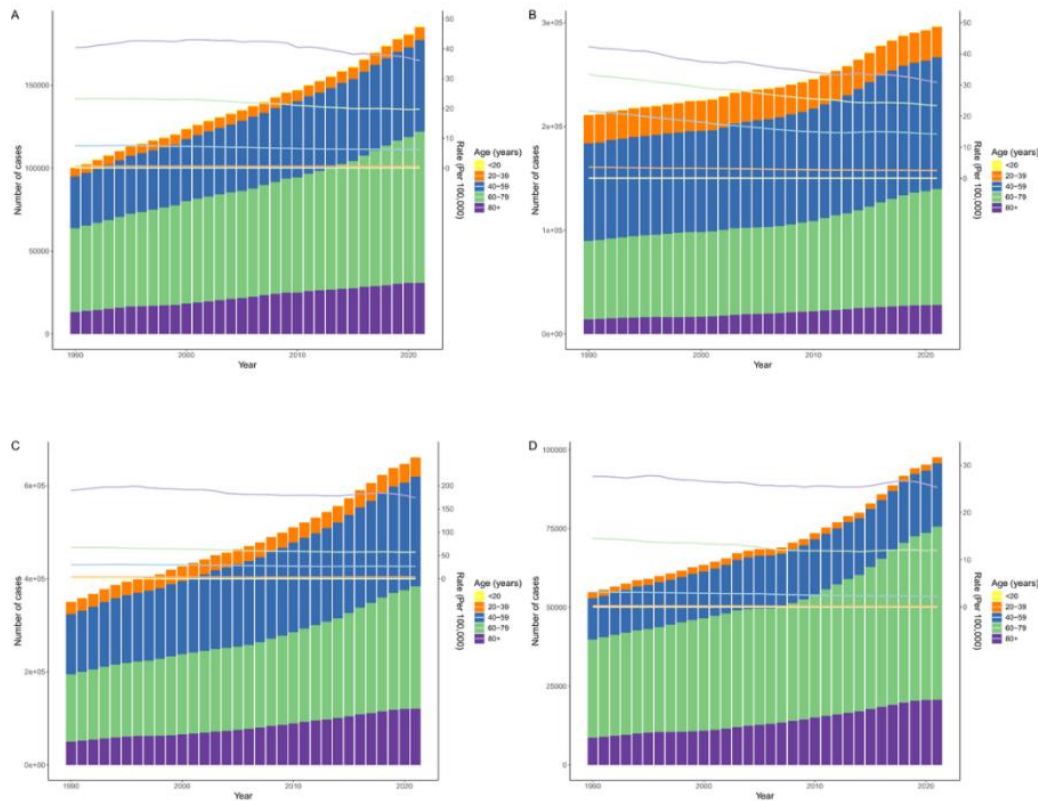
OC Mortality Rate: There is an overall decreasing trend over time for the 60-79 and 80+ age groups, while the trends for the other age groups are not as evident (Supplementary Figure 5A).

CC Mortality Rate: There is an overall decreasing trend over time for the 40-59, 60-79, and 80+ age groups, with no clear trend for the other two age groups (Supplementary Figure 5B).

BC Mortality Rate: The mortality rate remains relatively stable, with no evident trend (Supplementary Figure 5C).

UC Mortality Rate: The 80+ age group initially shows a decrease over time, followed by a few years of increase and then a subsequent decrease. The 40-59 and 60-79 age

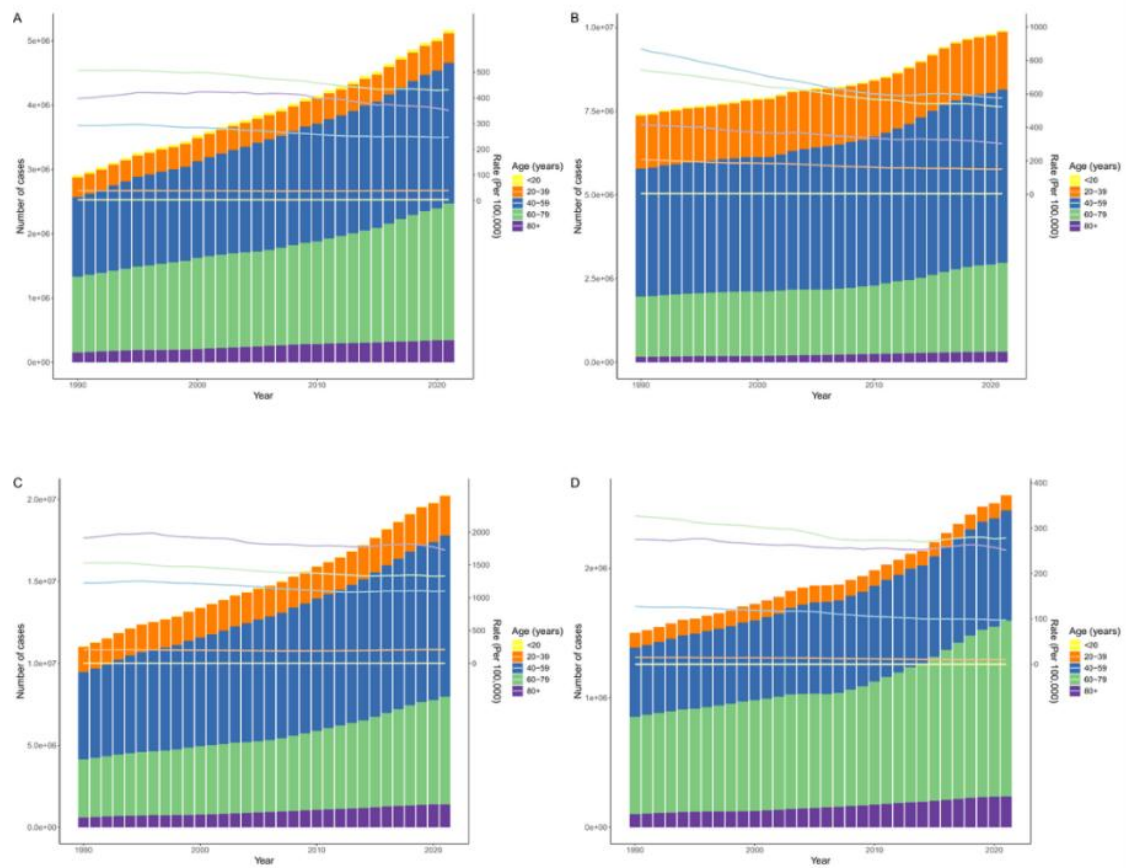
groups show an overall decreasing trend over time, while the 20-39 age group shows no clear trend, and the <20 age group has a mortality rate of 0 (Supplementary Figure 5D).



Supplementary Figure 5. Global GCs Mortality Counts and Rates by Age Group (1990-2021). OC (A), CC (B), BC (C), UC (D).

The number of DALYs for all four types of GCs is highest in the 40-59 and 60-79 age groups, with the <20 age group having the fewest (for UC, the <20 age group has 0 DALYs). OC DALY Rate: The highest DALY rate is in the 60-79 age group, followed by the 80+ age group. For the 40-59, 60-79, and 80+ age groups, there is an overall decreasing trend over time, while the trends for the other two groups are not as evident (Supplementary Figure 6A). CC DALY Rate: The highest DALY rate is in the 40-59 age group, followed by the 60-79 age group. All age groups, except for the <20 age group, show a decreasing trend over time (Supplementary Figure 6B). BC DALY Rate: The DALY rate decreases as age groups get younger. For the 80+ age group, the DALY rate increases over time initially, stabilizes for a period, and then decreases. The 40-59 and 60-79 age groups show an increasing trend over time, while the trends

for the other two age groups are not as evident (Supplementary Figure 6C). UC DALY Rate: The highest DALY rate is in the 60-79 age group, followed by the 80+ age group. All age groups show an overall decreasing trend over time, with the <20 age group having 0 DALYs (Supplementary Figure 6D).



Supplementary Figure 6. Global GCs DALY Counts and DALY Rates by Age Group (1990-2021). OC (A), CC (B), BC (C), UC (D).

Age-Period-Cohort (APC) Model Assessing the Independent Impact of GCs Burden

Age Effect Longitudinal Curves

OC Mortality: Mortality increases with age until 90-95 years old, after which it decreases as age increases (Supplementary Figure 7A). CC Mortality: Mortality increases with age until around 55-60 years old, after which it stabilizes (Supplementary Figure 7D). BC Mortality: Mortality increases with age (Supplementary Figure 7G). UC Mortality: Mortality increases with age until around

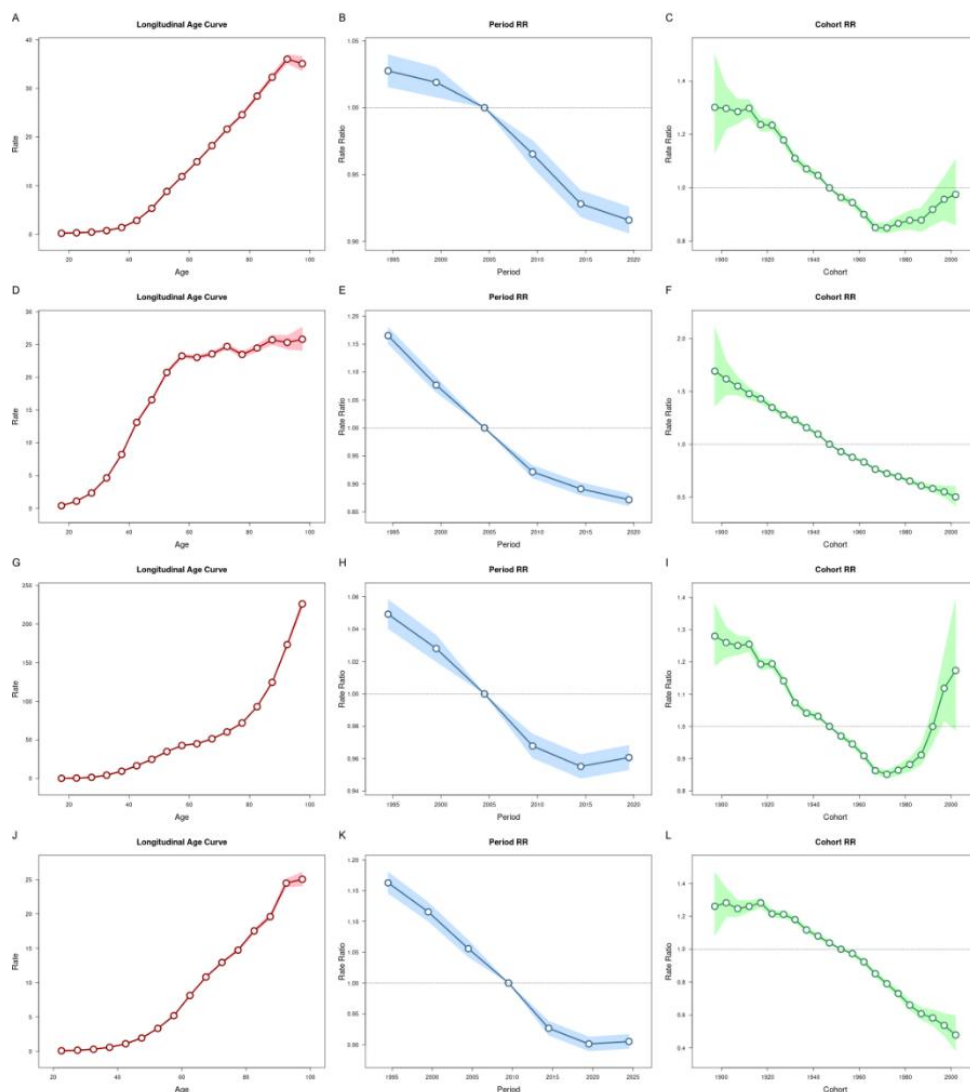
90-95 years old (Supplementary Figure 7J).

Period Effect Rate Ratios

OC and CC Mortality: Mortality rates show a downward trend over time (Supplementary Figures 7B and 7E). BC and UC Mortality: Mortality rates decrease until around 2015, after which they start increasing (Supplementary Figures 7H and 7K).

Cohort Effect Rate Ratios

OC Mortality: Mortality first decreases with the birth cohort, then increases after 1972 (Supplementary Figure 7C). CC Mortality: Mortality decreases with the birth cohort (Supplementary Figure 7F). BC Mortality: Mortality decreases with the birth cohort, then increases after 1972 (Supplementary Figure 7I). UC Mortality: Mortality decreases with the birth cohort (Supplementary Figure 7L).



Supplementary Figure 7. Age-Period-Cohort Analysis of Mortality Rates for Four Types of GCs (1990–2021). OC (A-C), CC (D-F), BC (G-I), UC (J-L).

Age Effect Longitudinal Curves

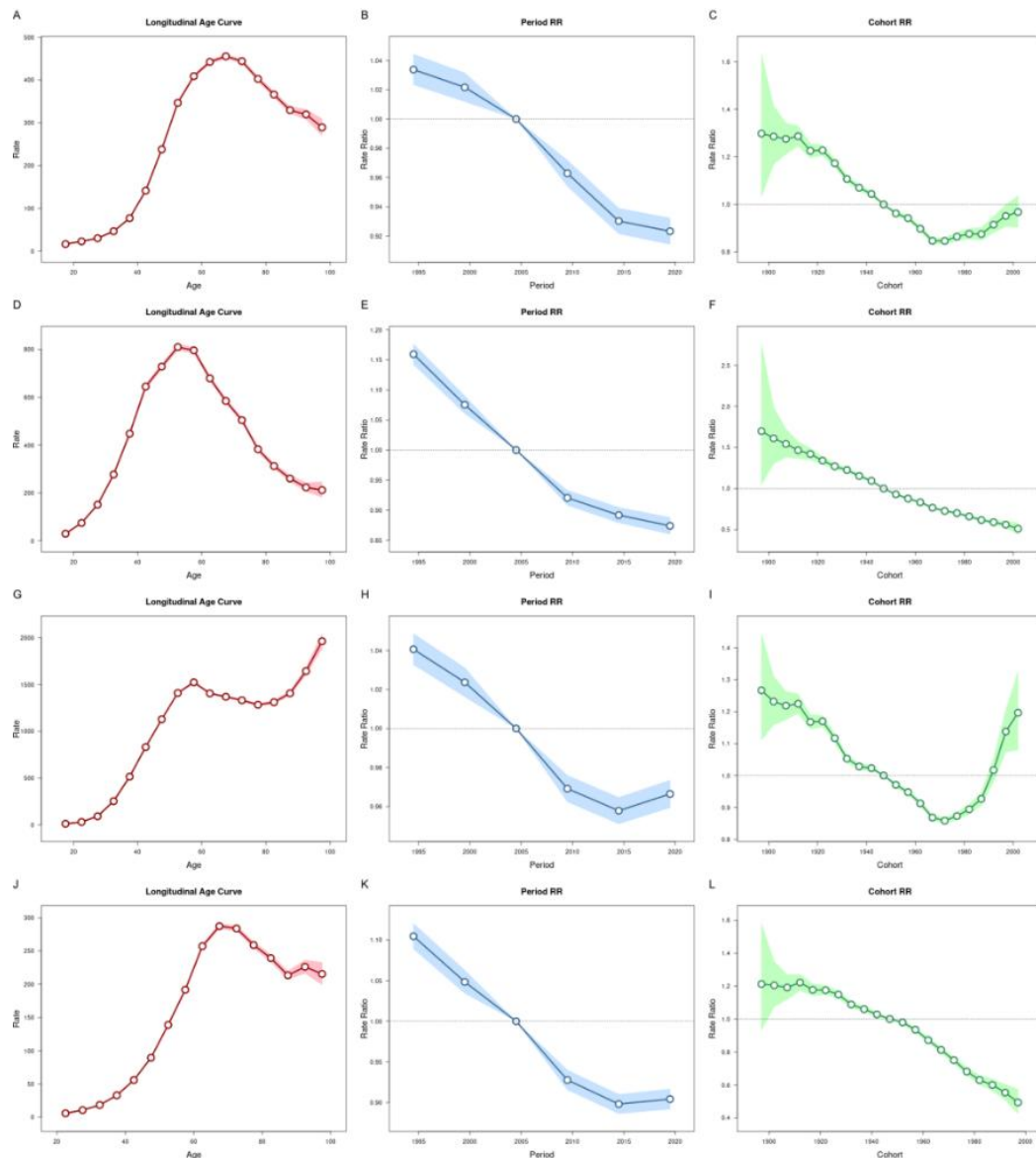
OC DALY Rate: The DALY rate increases with age until 65-70 years old, then decreases as age increases (Supplementary Figure 8A). CC DALY Rate: The DALY rate increases with age until 50-55 years old, then decreases (Supplementary Figure 8D). BC DALY Rate: The DALY rate increases with age until 55-60 years old, then decreases, and increases again after 75-80 years old (Supplementary Figure 8G). UC DALY Rate: The DALY rate increases with age until 65-70 years old, then fluctuates and decreases (Supplementary Figure 8J).

Period Effect Rate Ratios

The change in DALY rate over time is nearly identical to that of the mortality rate (Supplementary Figure 8B,8E,8H,8K).

Cohort Effect Rate Ratios

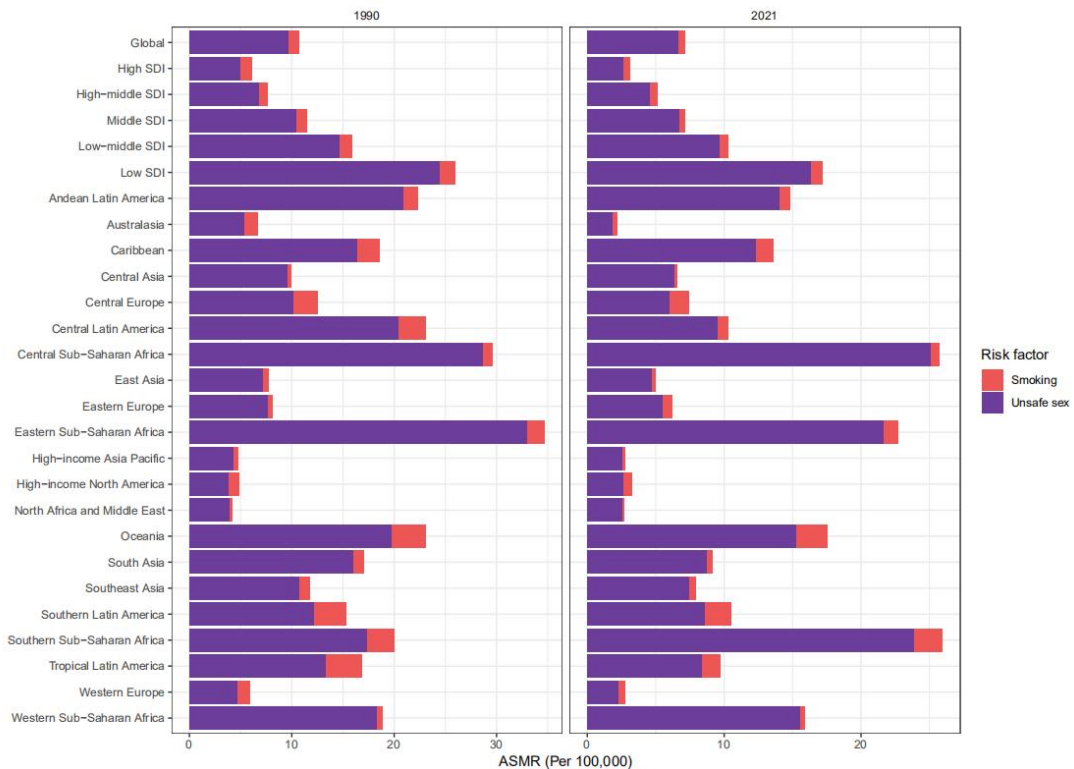
The change in DALY rate over the birth cohort is nearly identical to that of the mortality rate (Supplementary Figure 8C,8F,8I,8L).



Supplementary Figure 8. Age-Period-Cohort Analysis of DALY Rates for Four Types of GCs (1990 - 2021). OC (A-C), CC (D-F), BC (G-I), UC (J-L).

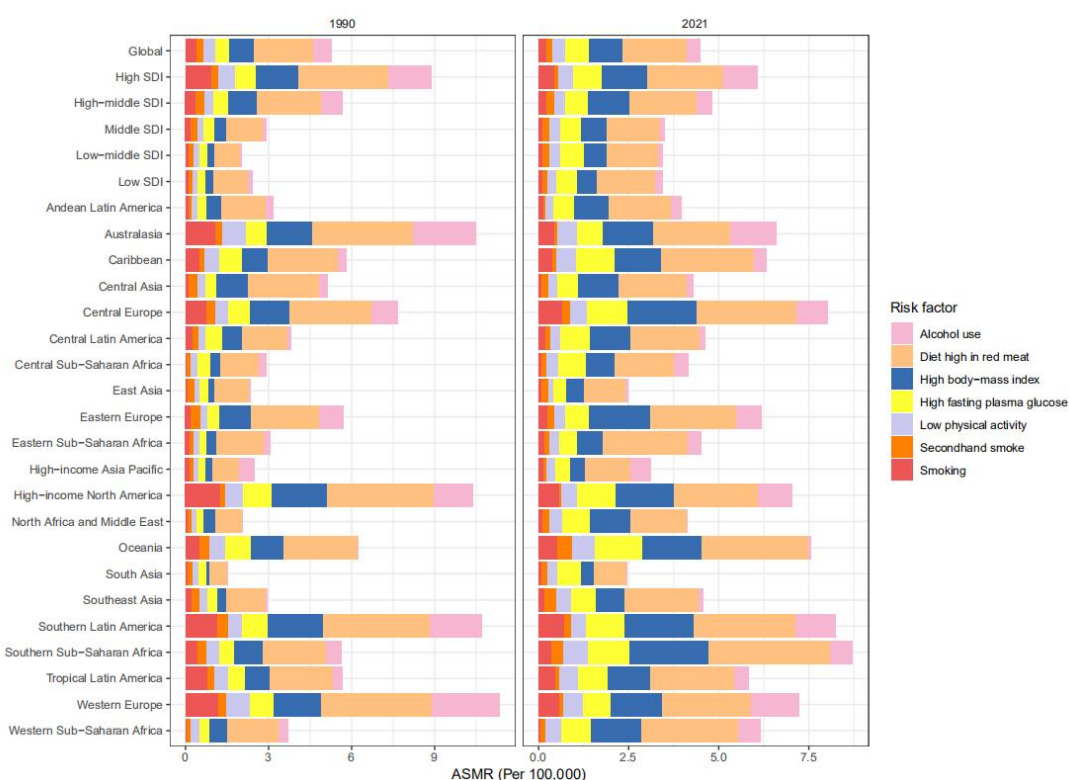
Risk Factors

The risk factors for CC mortality include Smoking and Unsafe sex (Supplementary Figure 9). The ASMR for CC diseases due to Unsafe sex is significantly higher than that due to Smoking. In different SDI regions, the CC disease ASMR due to both risk factors is the highest in low-SDI regions. In different GBD regions, the CC disease ASMR due to both risk factors was highest in Eastern Sub-Saharan Africa in 1990, and in Southern Sub-Saharan Africa in 2021.



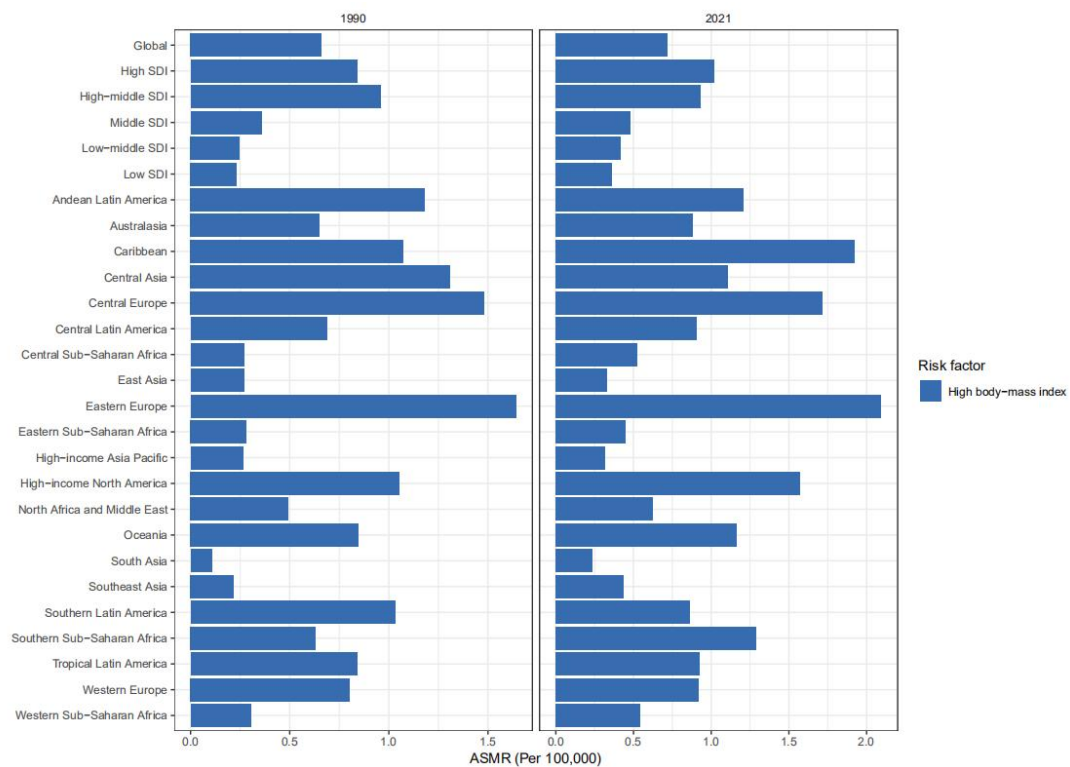
Supplementary Figure 9. Distribution of Risk Exposure Factors Contributing to CC Mortality in 1990 and 2021.

Risk Factors for BC Mortality include Alcohol use, Diet high in red meat, High body-mass index, High fasting plasma glucose, Low physical activity, Secondhand smoke, and Smoking (Supplementary Figure 10). The ASMR for BC diseases due to a Diet high in red meat is significantly higher than that caused by other risk factors. In different SDI regions, the BC disease ASMR due to risk factors is the highest in high-SDI regions. In different GBD regions, the BC disease ASMR due to risk factors was highest in Western Europe in 1990, and in Southern Sub-Saharan Africa in 2021.



Supplementary Figure 10. Distribution of Risk Exposure Factors Contributing to BC Mortality in 1990 and 2021.

Risk Factor for UC Mortality is limited to High body-mass index (Supplementary Figure 11). In different SDI regions, the ASMR for UC diseases due to High body-mass index was highest in high-SDI regions in 1990 and remains the highest in high-SDI regions in 2021. In different GBD regions, the UC disease ASMR due to this risk factor was highest in Eastern Europe in both 1990 and 2021.



Supplementary Figure 11. Distribution of Risk Exposure Factors Contributing to UC Mortality in 1990 and 2021.